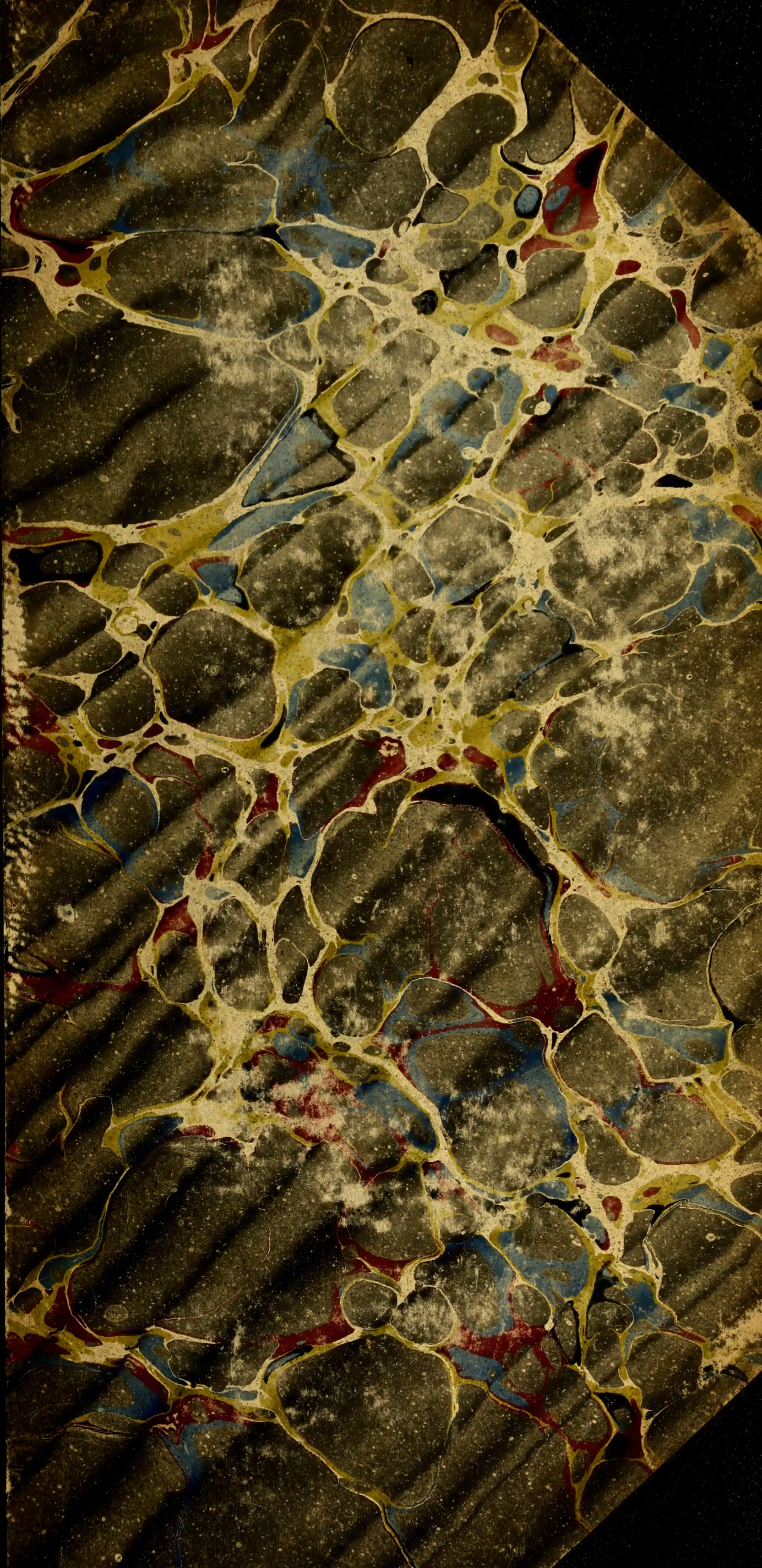

THE

AMERICAN

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PHILADELPHIA COLLEGE OF PHARMACY.

EDITED BY

WILLIAM PROCTER, JR.

PROFESSOR OF PHARMACY IN THE PHILADELPHIA COLLEGE OF PHARMACY.

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THE

AMERICAN JOURNAL OF PHARMACY.

JANUARY, 1864.

ON ECONOMY IN THE USE OF ALCOHOL IN PHARMACY.

BY WILLIAM PROCTER, JR.

It has often been a cause of remark among American apothecaries as to how their British confreres get on in preparative pharmacy with alcohol at four dollars per gallon. The low price at which this important solvent has been attainable, until a recent date, has induced its free employment in pharmaceutical processes, and in the late revision of our Pharmacopœia its use has been even more extensively resorted to in preparing extracts, fluid extracts and resins than in previous editions.

The use of alcohol offers many advantages :—1st, in its efficiency as a solvent of medicinal principles; 2d, its rejection of inert starchy and gummy substances; 3d, its greater volatility, requiring less time and heat in evaporation.

But just as this authoritative codex has been promulgated, the apothecary, the agent who is to carry out its precepts, is met by the stubborn fact that alcohol, owing to the war tax on whiskey, and the rise in the price of grain, has risen from 50 cents to 180 cents per gallon, with the prospect of a greater rise from an additional war tax! It may be asked, under these circumstances, what course is the pharmaceutist to adopt? Must he proceed as though no change in the price of this solvent had occurred, and add on its cost to his preparations, or can he, by a judicious use of the solvent, accomplish the end with a less quantity and more effectually, whilst much of what is used may be recovered by distillation.

To make a pint of a Fluid Extract, a quart of alcohol in the shape of diluted alcohol is required, and often much more is used. As many apothecaries have no facilities for recovering alcohol by distillation, this must, in these cases, be added in full to the cost of the preparations.

It is believed that, in most instances, where alcohol is merely used as a solvent, it may be partially recovered by distillation without serious injury to the preparations, but the particular object of this paper is to direct attention to the importance of economizing in the use of alcohol by a more skilful conduction of the process of percolation, using more time and less alcohol, so as to get an equal quantity of dissolved matter with a smaller amount of solvent. This is entirely practicable in most instances by the use of uniformly fine powders, (with a few exceptions), and by regulating the flow from the percolator so that the fluid shall have time to exert its maximum solvent power.

The directions in the new Pharmacopœia, in the preliminary chapter on percolation and powders, are so explicit and full that the reader should be at no loss to understand them. Failure, if it occur, must therefore arise from neglect of these precautions. Let us take, for example, Fluid Extract of wild cherry bark:—Sixteen troyounces of powdered bark are to be extracted by means of ordinary alcohol, (sp. grs. ·835), and the alcohol is afterwards to be wholly separated from the extracted matter. If a fine powder is used as directed, duly moistened with a fourth of its weight of alcohol, and then compressed in the percolator, the fluid will pass slowly and almost like syrup in consistence at first, and long before the quantity directed in the Pharmacopœia has passed, the bark will have been nearly exhausted. This should be set aside and water containing a little alcohol added to the percolator to displace the absorbed alcohol, until the liquid passes cloudy, when the process may be stopped. Now, by resorting to a still heated by a water bath, as recommended at page 13 and page 22 the alcohol may be recovered almost entirely.

These remarks apply to the fluid extracts of Ipecacuanha, Sarsaparilla, Senna, Gentian, Dulcamara, Cinchona, Colchicum, etc.; to the Extracts of Arnica, Cinchona, Podophyllum, Colocynth, Dulcamara, Nuxvomica, Ignatia, Jalap, and Seneka; the Resins of Jalap, May-apple and Scammony, and to compound Syrups of Sarsaparilla and Squills.

Of course these remarks do not apply to the tinctures where alcohol is permanently retained, except so far as the recovery of the last portions absorbed in the dregs is concerned, where the the bulk of these renders the quantity retained an object. It is suggested that the impure alcohol, more or less diluted, which may from time to time be recovered from tincture dregs should be kept in a common receptacle until its quantity offers an inducement to purify it by a careful distillation.

Neither do they apply to the Ethers, to Chloroform, or to the Spirits, the prices of which will have to be raised to cover the increased price of the alcohol they contain or consume.

Allusion has been made to distillatory apparatus, noticed in this number. It is believed that these offer several advantages worthy of adoption, but that much power and convenience may yet be obtained by the adaptation of a steam heating apparatus, capable of being carried on by gas heat on the working counter, to the operations of evaporation and distillation.

Philadelphia, Dec. 1863.

NOTE ON FUNNELS AND WEIGHTS.

By Prof. Millington,

Late Professor of Chemistry in William and Mary College, Va., and in the University of Mississippi.

To the Editor of the Journal of Pharmacy:

Sir—On page 572 of the November number of your work, you have some hints in regard to Funnels, and ask an improvement in their construction. I beg to say I have been in the habit of using a simple contrivance in my Laboratory that seems to obviate the difficulty complained of,—viz: the escape of air from a bottle while the liquid is flowing into it. I have several pieces of wire, or sticks glass, or strips of sheet lead, about four or five inches long, bent into the form of the capital letter U. One end of this implement is introduced into the bottle before inserting the funnel, which now cannot possibly fit the neck so as to obstruct the air from flowing out; or a narrow strip of window-glass or two may be cemented on to the outside of the funnel, and will answer the same purpose.

The subject of medical weights has been taken up in the late edition of the Pharmacopœia of the United States, and is now occupying the attention of the profession. Small weights are very subject to be lost or blown away, and, if accurate, are always expensive. Any careful person, can, however, make their own small weights by adopting the process I make use of, which is as follows: Procure some pieces of wire, of such diameter that about three or three and a half inches may weigh ten grains in an accurate balance. Adjust the piece you are about to use to that weight exactly, by cutting off its length with a sharp pair of scissors or pincers. Double the wire into two equal halves, and with a sharp chisel and blow of the hammer cut the piece in two at the bend. Weigh the two pieces against each other: they ought to be exactly five grains each. Next fix these two pieces on to the smooth surface of a piece of sheet lead by a very little rosin or wax cement. Then, with an accurate pair of small dividers or compasses, divide each wire into five equal parts, and mark the divisions slightly on the lead. Then, with the chisel, as before, cut off one division from one of the wires, and two divisions (in one piece) from the other. Then take up the wires, and, by the heat of a spirit lamp, clean off all the cement carefully, and you will be in possession of a one, two, three, and four grain weight; and with them any number of grains can be weighed up to ten grains. Lastly, bend the one grain weight into a circular curve, to prevent its rolling about; the two grain bend to the shape V; the three grains into a triangle; and the four grain into a square. Brass or iron wire will answer, but for the best weights platinum or pure gold wire should be selected. By using finer wire, and beginning with one grain, decimals of a grain can be obtained; or by larger wire, the decimals of a gramme. These, and all small weights, should always be handled by a pair of nippers.

ON THE RELATIVE ACTIVITY OF AMERICAN AND EUROPEAN ACONITE ROOT.

By William Procter, Jr.

At the Meeting of the Association held in Philadelphia, September, 1862, the following query was accepted by me: "What is the relative activity of the root of Aconitum napellus grown in the United States and that imported from Europe, based on their yield of aconitia, and what objections, if any, exist to the economical culture of the plant in the United States." Soon after the meeting adjourned, a letter was addressed to Messrs. Tilden & Co., of New Lebanon, New York, who cultivate aconite for making the extract, requesting their aid in obtaining a sufficient quantity of the American grown root, to make the comparison. The very early setting in of the winter interfered with their getting the root, and it was not until early spring, when the frost left the ground, that they could have it gathered. It was then carefully dried. The quantity received was rather more than a pound avoirdupois. So carefully had the roots been removed that the fibres were mostly remaining; the main roots varying in diameter at the caudex from a quarter to three-quarters of an inch, and from three to six inches in length, including the tap root. The color of the epidermis is purplish brown, inclined to black on the older portions, and the odor is rank and somewhat like that of opium.

After carefully drying the aconite it was ground to moderately fine powder. 5000 grains of this were macerated for two weeks,* in sufficient alcohol, sp. gr. ·835, to moisten it, then packed into a glass percolator, and slowly percolated with alcohol until five pints of tincture had passed. The percolate was placed in a retort, and, by aid of a water bath, four pints of alcohol were recovered, and the residue evaporated to four fluidounces. To this a fluidrachm and a half of diluted sulphuric acid mixed with a fluidounce of water was added, and the whole evaporated to two fluidounces and a half. The residue was syrupy in consistence, with oleo-resinous globules floating on it, with a decided acid reaction. The aconitia being in the state of sulphate, and hence in-

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* This long maceration was rather accidental than intentional.

soluble in strong ether, the liquid was agitated with two fluidounces of washed ether to remove the oleoresin ; after decanting, the washing was repeated. The aconite liquor was now treated with an excess of solution of ammonia to liberate the aconitia, and the alkaline mixture washed by agitation and decantation with three separate portions of ether, of two fluidounces each. The ethereal liquids, united, were evaporated spontaneously in a tared capsule : the residue weighed sixty grains, and was dark colored, strongly alkaline and not entirely hard, owing to a little oleoresin present that had not been completely removed by the preliminary washing. The impure mass was mixed with a fluidounce of distilled water, and diluted sulphuric acid carefully dropped in, with the application of heat, until the acid ceased to be neutralized, and the liquid remained slightly acid. A residue of dark brown oleoresin remained. The fact of this occurring shows the importance of well washing the solution before separating the aconitia. The solution of impure sulphate of aconitia was now filtered and the filter carefully washed. The filtrate weighed 585 grains troy. To ascertain the aconitia strength of this liquid, it was assayed by the process of Prof. F. F. Mayer, (Amer. Jour. Pharm., vol. xxxv. p. 23,) with iodohydrargyrate of potassium. Five grains of this solution diluted, required sixty-eight grains of the test liquor, a preliminary trial having been made to get an idea of the strength of the solution. Then as 68 grs. of test liquor represent ·36312 gr. of aconitia present in 5 grains of the solution of sulphate of aconitia, therefore 585 grains equal 42·483 grs. of aconitia from 5000 grains of the root, or nearly 0·85 per cent. ($585 \div 5 = 117 \times \cdot 36312 = 42\cdot 483$.)

The residual liquor after the extraction of the aconitia, was then treated with an ounce of chloroform and a little more ammonia, but owing to the ether present and the density of the extractive solution it did not separate. To effect its separation, sufficient ether was added to make the mixed chloroform and ether lighter than the extractive solution, when it was decanted, evaporated, and heated with a fluidounce of water. The addition of diluted sulphuric acid liberated a bulky hydrated oleoresinous precipitate which, on standing, gradually lost its water of hydration and assumed a soft consistence, staining paper. The liquor from this precipitate, with its washings, was tested for aconitia, and 4·065 grs. more of the alkaloid indicated, making the whole according to Mayer's test 46·56 grs.*

European Aconite Root.

A parallel experiment was now tried with European aconite root of German origin; 5000 grains of this root, in moderately fine powder, were treated in a similar manner with alcohol sp. gr. ·835. The liquor concentrated to three fluidounces mixed with a quantity of diluted sulphuric acid, equal to that employed in the first experiment, and then washed with ether until the latter ceased to be colored. The aconitic liquid separated from the ether was mixed with an excess of ammonia and again treated with ether till exhausted. The ethereal liquids left, on evaporation in a capsule, 30 grains of soft brown residue strongly alkaline to test paper. This, when treated with a fluidounce of water, and sufficient diluted sulphuric acid, all dissolved but a trace, showing that the more thorough preliminary washing in this instance had removed all the oleoresin. The impure solution of sulphate of aconitia weighed 686 grains. Five grains of this required 30 grs. of test liquor to saturate it. $686 \div 5 = 137 \times 0{\cdot}1602 = 21{\cdot}94$ grains.

The residual aconite liquor was treated with chloroform, ammonia and ether, as in the other experiment. A few grains of soft extract only were obtained, exhibiting, when properly treated, but a faint cloudiness with the test solution for aconitia.

The ethereal washing liquids containing fixed oil and resin were separately evaporated. The product from the American root, amounted to 114 grains; whilst that from the European root equalled 180 grains.

The two solutions of sulphate of aconitia were now treated to isolate the alkaloid. That from the European root was carefully precipitated by ammonia, the precipitate collected on a filter, washed and dried. It weighed *ten* grains.

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* The reader will observe that Prof. Mayer's test indicates twice as much aconitia as was obtained by experiment. I am unable to account for this, unless by inferring an error in Prof. Mayer's numbers.—W. P., Jr.

The solution from the American root was then precipitated by ammonia, and the liquid and precipitate washed with ether to remove the aconitia. The ethereal liquid, on evaporation, left the aconitia somewhat gelatinous, and on standing, decided evidences of crystallization were manifested. Most of the alkaloid dried in a resin-like form of a yellowish color, which, in powder, had a light straw-color, and weighed 21 grs.

It now remains to remark on the feasibility of cultivating aconite root in the United States with a view to commercial supply. The following statements are derived mainly from a letter from Messrs. Tilden & Co., of New Lebanon, Columbia county, N. Y., who for years past have cultivated this plant for the leaves. They raise aconite from the seed sown in drill; after the first year, the plants are separated and set out in rows, nine to twelve inches apart, in good soil. It has been found most successful to reset one-third of the plants every year. When two years old the tops may be used in medicine, but the roots should not be employed until they are three or four years old. The specimen submitted with this report is not so large as the European root of commerce. One of the average roots weighs only forty grains. Supposing that forty thousands of these were raised on an acre of good soil, ($40000 \times 40 \div 7000 = 228$) the produce would be only 228 pounds avoirdupois. But it is quite probable that, with more age and favorable conditions, the yield would be at least twice as large, or about 500 pounds per acre, as in the sample of European Root used the roots averaged nearly 80 grains.

Aconite has fewer enemies among the insect tribes than any of the ordinary narcotics or sedatives, not being preyed on by the slug, so destructive to hyoscyamus and belladonna. The soil should be deep and well manured with animal manure, and the plantation kept clean. The roots should be dug late in the fall, and then thoroughly dried.

From the foregoing parallel experiments, it would appear that Aconite roots grown in this country are stronger in aconitia than are the commercial European roots. The sample of European Aconite used was, so far as could be judged by external appearance, a fair specimen, and medicinally had given satisfaction. In all the papers that I have examined, from that of the discovery of aconitia by Brandes, about 1821, to that of Geiger and Hesse, in 1832, and Von Planta, 1852, none give the per centage strength of aconite root, and hence I have no data to decide upon the normal per centage of the drug. The experiments were conducted with entire fairness, and as nearly parallel as is usual in such investigations.—*Proc. Amer. Pharm. Assoc.*, 1863.

Philadelphia, Sept. 5th, 1863.

COPAIBA CAPSULES.

36 *Platt Street, New York, Nov.* 16*th,* 1863.

To the Editor:—

Dear Sir:—As many inquiries have been made as to the proportions of Copaiba and of Oil of Cubebs in the capsules of Balsam of Copaiba and oil of Cubebs, as prepared by me, I wish you would be so kind as to publish the subjoined formula in your valuable paper, so as the profession and trade will know what they are.

I take of

Pure Balsam Copaiba,	nine troyounces,
Ess. Oil of Cubebs,	one " "

To be divided into 480 capsules, each capsule containing gr. ix. of Balsam, and gr. i. of Ess. Oil of Cubebs.

The capsules are made of sweetened gelatin, after the following proportions;

Refined Gelatin,	95 per cent.,
White Sugar,	5 "
Water, S. Q.	

The "modus operandi" for making these capsules is known to every druggist, as described in the U. S. Dispensatory, and other formularies, by dipping metallic oval rods in the dissolved gelatin, and allowing it to cool on the rods, when they are taken off and filled with a blow-pipe.

E. QUERU,

Chemist and Pharmaceutist.

NOTE ON SOME PROPERTIES OF BERBERINA.

By William Procter, Jr.

Having occasion recently for information relative to the properties of pure berberina in an uncombined state, a reference to all the authorities at my disposal, including nearly all the papers published within the last few years, I noticed with some surprise that these writers, in describing berberina, treated the substance obtained from Berberis vulgaris by the agency of neutral solvents, and which, as Berberin is an alkaloid, must be a natural salt of that substance.

Buchner, the original discoverer of this principle, believed it to be a neutral substance. Liebig (Traité de chimie, tome ii. 645,) says it is alkaline, but in describing its preparation gives the original process, and describes its solubility in the form of its natural salt, as requiring 500 parts of cold water. Wittstein, in his "Practical Pharmaceutical Chemistry," (Darby's translation), also describes it in this condition as obtained by neutral solvents, and gives the same numbers for solubility that Liebig does. He also says that this natural salt is the *hydrochlorate,* a statement I have not seen elsewhere. I have consulted the papers of Fleitman, of Stenhouse and of Perrins, in the Pharmaceutical Journal, and those of Mahla and Merrill in this Journal, and none of them describe the properties of pure berberina.

The best process for isolating berberina is that hinted at by William A. Merrill, (Amer. Jour. Pharm., page 503, 1862), based on the separation of the sulphuric acid from the sulphate by either baryta or oxide of lead. Mr. Merrill prefers the oxide of lead, and I agree with him, as, from its insolubility in water, its excess does not interfere with the purity of the resulting alkaloid in solution.

Take the root of Hydrastis canadensis, or of Berberis vulgaris, preferably the former, in coarse powder, exhaust it by repeated decoction or digestion in boiling water, and evaporate the filtered liquids to a soft extract. Treat this with stronger alcohol by digestion in a water-bath still at several times until it is exhausted (or until a quart of alcohol has been employed for the extract from each pound of the root). Add to the tincture one-fourth of its bulk of water, distill off five-sixths of the alcohol, and add to the hot watery residue an excess of diluted sulphuric acid, and allow it to cool. The sulphate of berberina crystallizes out, and, if necessary, may be drained from the mother-liquid, re-dissolved in the smallest quantity of boiling water, and again crystallized.

The salt is now ready for decomposition by oxide of lead. The latter, as obtained by precipitation from the acetate or nitrate of lead by liquor potassæ, and well washed, and is added in excess, with agitation, to the sulphate of berberina dissolved in boiling water, the solution being kept hot during the decomposition. When a drop of the hot clear liquid will not be precipitated by baryta water or acetate of lead, the digestion is finished. The solution should then be filtered off hot, evaporated, and set aside for crystallization.

Examined by a lens, berberina crystallizes in stellated groups of minute acicular crystals, not so deep in color as those of the muriate of commerce, or Eclectic *hydrastin.* A grain of berberina, placed in a test tube, was shaken with repeated additions of water at about 60° F., with intervals of rest, during twenty-four hours, until it had nearly all dissolved,—which required 75 grains of water. The residue completely dissolved when the quantity was increased to 100 grains. The solution thus obtained was a clear and brilliant yellow color. When a grain is dissolved by heat in 75 grains of water, the excess crystallizes out on standing. Berberina is much more soluble in boiling water, and in hot alcohol, but it is less soluble in cold alcohol than in water, one grain requiring more than 100 grains of that liquid for solution. Storer, in his "Dictionary of Solubilities," page 67, gives Liebig's numbers for the solubility of berberin, which apply to its hydrochlorate according to Wittstein. It is soluble in acetone and methylic alcohol, whilst chloroform dissolves it but slightly, and ether, oil of turpentine, and oil of almonds, not at all. Acetic acid is one of its best solvents. It is also soluble in cold sulphuric acid, which it colors deep yellow. Nitric acid instantly decomposes berberina, with the production of a dark mulberry-purple color, which grows lighter by standing. This reaction is best shown by adding a minute fragment of nitrate of potassa to the solution of berberina in sulphuric acid, when the rich mulberry color is instantly developed.

When a particle of bichromate of potassa is employed, the color is much darker, almost purplish-black and remains so for some time. The saturated aqueous solution yields beautiful crystalline precipitates, with diluted nitric, muriatic, and sulphuric acids, but not with phosphoric acetic, citric, or tartaric acids. Aqueous iodine renders it opaque, and affords a brown precipitate; tannic acid and iodohydrargyrate of potassium, each a yellow one.

Both the watery and alcoholic solutions have a strong bitter taste. The existence of berberina in several of the natural orders of plants is quite remarkable, and suggests to Mr. Perrins that it probably possesses more valuable properties as a medicine than have yet been accorded to it.

ON A STILL FOR APOTHECARIES.

By William, Procter, Jr.

At the meeting of our Association in 1862 the following question was proposed and accepted : "What is the best form and material for a still for use by pharmaceutists, of from two to four gallons capacity, appropriate for being heated by gas or stove heat, and which shall be suitable for the recovery of alcohol in making pharmaceutical preparations."

In replying to this query, I will reverse the order and speak of the material first. Tinned copper is, by far, the best material for a still, lasting much longer and capable, by retinning, of being frequently restored to its original condition ; but owing to the high price of copper, the cost forms an objection that would prevent the general use of the apparatus. Tinned iron is, therefore, the material here suggested, which, with due care, will last a long time for liquids which do not attack the metal. The strongest objection to it is, perhaps, the fact that astringent solutions gradually work their way through the imperfections of the tinned surface, and are blackened by contact with the iron beneath. As the most expensive portion of the still is its condensing head, which does not come in contact with the liquid, a compromise may be made in regard to material by constructing the boiler of copper, and the condenser of tinned iron. In regard to the form of the still, the accompanying diagram will convey a correct idea to the reader, but to illustrate it to the members present I have had a tinned-iron still made, which will be better understood by a few explanations of the diagram. This still consists of two distinct parts, the boiler, A, and the condensing head, B. The former is cylindrical, 12 inches deep, 10 inches in diameter, with a tinned wrought iron flange, *a*, an inch wide, and a quarter of an inch thick. A similar tinned iron flange, *á*, is attached to the base of the head, which fits on the flange of the

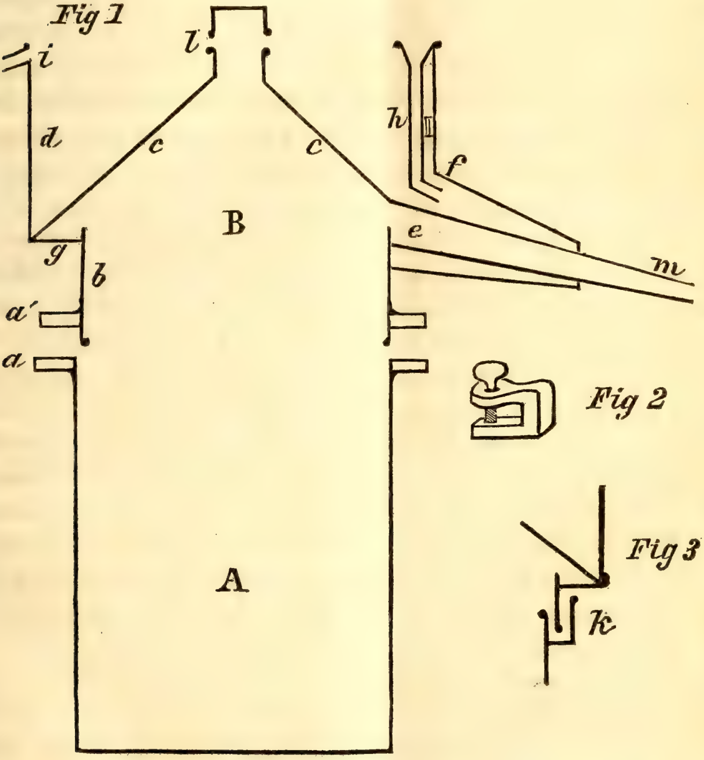


Fig 1
Fig 2
Fig 3

boiler, and forms a tight joint by means of twine or gum-packing, when held together with clamps. Rising from this is a cylinder of tinned iron, *b*, three inches high, which is surmounted by the conical condensing surface, *c;* united by means of a horizontal ring with the cylinder before mentioned. On the outside of the cone, and rising from its base, is another cylinder, *d*, which forms the receptacle for the refrigerating water. Passing out from the conical condenser is a tubular neck, *e,* ten inches long, surrounded for three-fifths of its length with a jacket, *f*, which opens into the receptacle for water. The neck is attached to the head so that all the liquid that condenses on the inside of the cone and is caught in the gutter, *g*, at once runs into the neck, and is thereby conveyed to the receptacle or receiver. Attached to the inside of the upper cylinder, immediately above the neck, is a funnel tube, *h,* which bends below and projects into the jacket, above the neck. On the side opposite, near the top, the cylinder is penetrated by the tube *i*, which is intended to carry off the heated water. The apex of the cone is surmounted by a short tubulure of tin an inch and a half in diameter, which is ordinarily closed by a tin cap slipping over it, and which may be closed more effectually by a good cork. In 1848, in the American edition of Mohr and Redwood's Pharmacy, the writer described under the name of "Pharmaceutical Still," an apparatus analogous to the above, which, however, differed in two important particulars: 1st, in having a water joint as at *k*, fig. 2, instead of the iron flanges; 2d, in not having the jacket around the neck, which is really the greatest improvement in the present still. The chief objections to the water joint are, *first*, that it will not admit of any elasticity in the internal atmosphere of the still without forcing out or sucking in the water in the joint; 2d, the contents of the boiler cannot be removed until the rim is emptied by a syphon, and then in pouring out the contents it gets into the rim; and 3d, when the fluid rises by rapid ebullition it gets into the joint, and is diluted or spoiled as the case may be.

It now remains to speak of the manner of using this alembic, and of making the joint tight. After charging the boiler the operator extends a piece of moist, loose textured, coarse twine, around the centre of the iron flange, crossing the ends. The head is then placed in position, and by the aid of five clamps, see fig. 2, the flanges are compressed strongly together, when the twine forms an air-tight joint; of course, a ring of rubber would be more elegant, but scarcely more effective, and by no means so convenient and economical. This simple idea I owe to a recent visit to the laboratory of Dr. E. R. Squibb, who gave me permission to use and describe it. When in operation, the boiler should be supported in a jacket, as, for instance, the top of a common cylindrical stove, by means of a ring of sheet iron pressing against the lower side of the clamps. A current of cold water is allowed to run into *h*, which carries it directly to the neck, where the largest amount of vapor is to be condensed, and which should be kept cooler than any other part of the condensing surface. The tubulure at *f* enables the operator to inspect the interior, by means of a glass or wooden rod. A gum tube will convey the waste water away from *i*. In distilling very volatile liquids a Liebig's or other condenser may be attached to the neck, at *m*, if it is deemed advisable. Gas heat is admirably adapted for this still when used with a jacket, and when the distillation of alcoholic solutions is carried nearly to dryness, a water bath jacket may be employed. Of course, in using this still for recovering ether, every precaution should be taken as regards tight joints and effectual condensation—using a water bath heat, and ice water in the condenser, the neck being luted to the receiver, which, of course, should be ventilated by a small opening to prevent accidents. The tubulure, in this case, should be well closed with a good velvet cork. The apparatus exhibited cost eleven dollars, but this great price arose from the clamps and tinned flanges, which, were the apparatus much used, could be made much more cheaply. This still was constructed by Mr. Isaac S. Williams, 726 Market street, Philadelphia.—*Proc. Amer. Pharm. Assoc.*, 1863.

Philadelphia, Sept. 5th, 1863.

GLEANINGS FROM THE FRENCH JOURNALS.

By the Editor.

On Syrup and Extract of Cinchona of normal strength.—M. Guilliermond, in an elaborate paper on this subject, proposes to make a normal or uniform alcoholic extract of cinchona which shall contain about one-sixth of quinia or in the ratio of 32 grammes of sulphate of quinia from each kilogramme of cinchona. This will make it necessary to use only the better quality of cinchona, and where the percentage strength is less than 3·2 percent. of sulphate of quinia; he proposes to mix richer barks with the weaker so as to make the average. M. Guilliermond finds that when such bark is extracted with alcohol of 80 per cent., it yields about one-fifth of its weight of extract, and this extract is the preparation from which he proposes to make his normal syrup of cinchona, such extract containing about 15 percent. of quinia.

To make the syrup, the following recipe is recommended: White Spanish wine, 500 grammes; sugar, 500 grammes; alcoholic extract of cinchona, 10 grammes. The extract is first dissolved in the wine and the sugar afterwards. The syrup has about three-quarters of a grain of quinia for each fluidounce.

The idea of graduating the strength of galenical preparations by preliminary testing, has been repeatedly brought forwards, but the impracticability of recipes thus constructed, except in expert hands renders their general adoption inexpedient. The irregularity in the composition of even the better class of cinchona barks is sufficiently great without combatting that of the inferior grades. M. Guilliermond concludes his paper with a tabular view of the strength of the several commercial cinchona barks enumerated, which must only relate to the particular specimens examined, and not to all the samples of each particular kind.

	yields.	per ct.
Flat Calisaya without epidermis	3·	to 3·2
Quill Calisaya with epidermis	1·5	to 2·
Flat Carabaya bark of Peru without epidermis	1·5	to 1·8
Quill Carabaya bark of Peru with epidermis	·8	to 1·0
Flat red Cusco bark without epidermis	·4	
Quill red Cusco bark with epidermis	·0	

	yields.	per ct
Flat Huanuco bark, flat, without epidermis	·6	
Pale-yellow Huanuco bark	·6	
Quill Huanuco bark	·2	
Cinchona of Jaen (Peru)	1·0	
Bright-red Cinchona	2·0	to 2·5
Pale-red Cinchona	1·5	to 1·8
Fine gray Loxa bark (Condamine)	·8	
Fine gray Loxa bark (Negrilla)	·2	
Yellow Guayaquil bark	·3	to ·4
Quilled orange-yellow bark of New Grenada	1·8	
Yellow Calisaya bark of Bogota	3·0	to 3·2
Pitaya bark	2·0	to 2·5
Ligneous Carthagena bark	2·0	
Orange-yellow bark of Mutis	1·5	to 1·6
Red bark of Mutis	1·2	to 1·4
Yellow bark of Mutis	1·2	to 1·4
Rose-colored Cinchona of New Grenada	1·8	
Maracaibo bark	0·3	to 0·4
Inferior Cusco bark	0·05	
Inferior barks from Lagos	0·06	
Inferior barks from Equador	0·06	
Inferior pale-red bark of New Grenada	0·018	
Inferior white bark of New Grenada	0·006	

Tannate of Quinia.—M. D. Smedt (Jour. d'Anvers) states that the usual method of obtaining this salt is to decompose a solution of acetate of quinia with a solution of tannin. But it is found that a large excess of tannin is required, which M. Smedt considers to be due to the influence of the acetic acid thrown out of combination. To prevent this interference, he proposes to carefully saturate the tannin with ammonia, so that the reaction shall be between tannate of ammonia and acetate of quinine, which prevents all difficulty. The precipitated tannate is washed with water and dried.

Tannate of quinia is employed in infantile cases, where the sulphate has a harsh action on the stomach and bowels.—*Jour. de Pharm., Aout.*, 1863.

On the preparation of Lemon Syrup.—M. Timbalagrave offers the following as an improved recipe for lemon syrup:

Take about twenty-five lemons, remove the exterior yellow oil-cells and their contents by grating, avoiding as far as possible the white part of the rind. The zestes of the lemons thus obtained are placed in a bottle and two kilogrammes of simple syrup (3½ pints), and leave them in contact four days, with occasional agitation, when the whole is added to 18 kilogrammes (31½ pints) of boiling simple syrup and strained. When cold, add 50 grammes (13 drachms) of citric acid dissolved in an equal weight of water, and mix them.

This process, according to the author, gives a product having a very agreeable aromatic taste, which it preserves a long time. Lemonade prepared with this syrup can be kept during five or six months without alteration.

The aromatic syrup can be prepared in the season when lemons are plenty, as it keeps well. Syrup of oranges may be prepared by a similar process.—*Jour. de Pharm. de Toulouse* and *Jour. de Pharm.*

Test for Chloroform.—M. Hardy states that sodium, when dried by wiping it with unsized paper, does not act on chloroform if pure, but when it contains alcohol or ether there is a disengagement of hydrogen. This reaction occurs without heat, and almost instantaneously.—*Jour. de Phar.*

Process for bleaching Gutta percha.—Dissolve the gutta percha in twenty times its weight of boiling benzole, add to the solution plaster of very good quality, and agitate the mixture from time to time. By reposing for two days the plaster is deposited, and carries down with it all the impurities of the gutta percha, insoluble in benzole. The clear liquid decanted, is introduced by small portions at a time into twice its volume of alcohol, 90 per cent., agitating continually. During this operation the gutta percha is precipitated in the state of a pasty mass, perfectly white. The desiccation of the gutta percha, thus purified, requires several weeks' exposure to the air, but may be accelerated by trituration in a mortar, which liberates moisture which it tends to retain.—*Jour. de Pharm., Aout.*, 1863.

On soluble Citrate of Magnesia.—M. Hager has not been able to obtain a soluble citrate of magnesia by the process of

M. de Letter (see this Journal, page 312, 1863), which has in his hands produced the insoluble modification of the citrate of magnesia. The author's study of the subject has satisfied him that citrate of magnesia can present three distinct modifications:

1st. *Crystalline*, soluble in 80 to 90 parts of water (Ci. 3 MgO. + 14HO;

2d. *Amorphous*, soluble in two parts of water;

3d. *Metamorphous*, soluble in eight or ten parts of water, and having a very great tendency to assume the crystalline condition.

It is this crystalline modification which constitutes the insoluble citrate, and which presents the form of microscopic needles, derived from a right rhomboidal prism. Its production constitutes an embarrasment which ought to be avoided, since it is only the soluble citrate that is intended to be used.

M. Hager prepares it as follows:

Forty parts of citric acid of commerce is reduced to powder, then mixed with 25 parts of carbonate of magnesia of the shops, also in powder, and sufficient alcohol of sp. gr. ·833 is added to make a thick mixture. The whole is allowed to stand for several hours at a medium temperature, after which it is dried in a stove or in a water-bath at the temperature of 113° F.

The dry residue is the product sought. It is soluble in two parts-and-a-half of water at 60° F. by standing half an hour, but at a temperature of 86° F. it dissolves at once.

Whether it has been prepared hot or cold, with little or much water, the solution preserves its clearness even after long standing. The citrate that it contains is neutral, and two assays gave 12·7 and 13·1 eq. of water.

To obtain the soluble citrate without doubt, it is necessary that the carbonate of magnesia employed be exempt from dust and impurities; and further, that as this salt [the carbonate] has not always the same composition, it is safer to make a preliminary assay to determine the proportions of acid and carbonate to be employed. According to the author, 25 of carbonate to 40 of acid is a mean proportion.

The *metamorphous* salt is always produced by the process of M. Dorvault [by fusing the acid with a little water, and adding calcined magnesia.]—*Pharm. Centralhalle* and *Jour. de Pharm.*

Caffeidin, a new base derived from Caffein.—M. Strecker, in submitting a concentrated aqueous solution of caffein to distillation with a hot saturated solution of baryta, obtained water, ammonia, and methylamine, which M. Wurtz has already obtained by means of potassa and caffein. In the fixed residue in the retort M. Strecker has found carbonate of baryta as well as *caffeidin*, a new base.

After filtering and neutralizing with sulphuric acid, the liquid is evaporated in a water-bath, which yields colorless needles, which are increased in quantity by adding alcohol to the mother-liquid. These crystals are the sulphate of caffeidin, very soluble in water, and not precipitated by potassa or ammonia in solution.

Solid potassa separates from its solution oily drops, not crystallizable, but soluble in water, and alcohol. Ether dissolves it but slightly.

This oily liquid constitutes *caffeidin*, $C_{14}H_{12}N_4O_2$. It is not volatile, and loses nothing at 212° F.—*Jour. de Pharm., Sept.*, 1863.

Compound of Quinia and Oil of Anise.—M. Hesse, in dissolving five parts of quinia and one part of oil of anise in boiling alcohol, found that brilliant crystals are deposited, derived from an oblique prism, the composition of which accords with the formula $2(C_{40}H_{24}N_2O_4) + C_{20}H_{12}O_2 + HO$. Without odor at common temperatures, they smell of anise only at 230° F. when decomposition commences. This compound is very soluble in ether, but is insoluble in water, cold or hot, but fuses at the temperature of boiling water.

The author has not succeeded in effecting similar compounds of quinia with phenic acid, creasote or essence of mint, roses, and cummin.—*Jour. de Pharm., Sept.*, 1863.

New Collodion, soluble without Ether. By M. Sutton.—The pyroxylin employed for this preparation is soluble in alcohol, and is obtained in the following manner: throw into a porcelain vessel of the capacity of 700 grammes, about 100 grammes (1543 grs. troy) of sulphuric acid of sp. gr. 1·83, and add to it

80 grammes of nitric acid, of sp. gr. 1·4. The porcelain vessel is set in another of boiling water, and when the mixture has attained a temperature of about 170° F., the cotton well carded and of the best quality, is added in quantity sufficient to fill the liquid with which it is left in contact five minutes.

The liquid is then rapidly decanted, the pyroxylin thrown into a vessel of water and washed with repeated portions of water, and then macerated for a night in water, then rinsed again, pressed and dried.

The success of the operation depends on the strength of the acids as indicated. The pyroxylin obtained is very short, and in the form of coarse powder; hence the washing requires care to avoid loss. When it is dry it is put in a bottle, with sufficient alcohol to cover it. Shake the bottle occasionally until a thick solution is obtained, which is preserved for use.—*Jour, de Pharm.*

On the Silica in Commercial Potash. By M. Rieckher.—The purified carbonate of potassa retains, as is well known, a certain quantity of silica, which causes its solution to become cloudy by standing.

Two means have been proposed for removing the silica: the first by M. Mohr, which consists in evaporating the solution till the carbonate crystallizes, when the silica and chloride remain in the mother-water.

M. Rieckher proposes to evaporate to dryness the solution of carbonate of potassa, and which should be free from sulphate. After cooling, the residue is moistened with carbonate of ammonia and evaporated again. The silica passes to the insoluble modification by aid of the temperature necessary for evaporation. By again dissolving and filtering, the carbonate is obtained free from silica.—*Jour. de Chim. Méd., Nov.,* 1863.

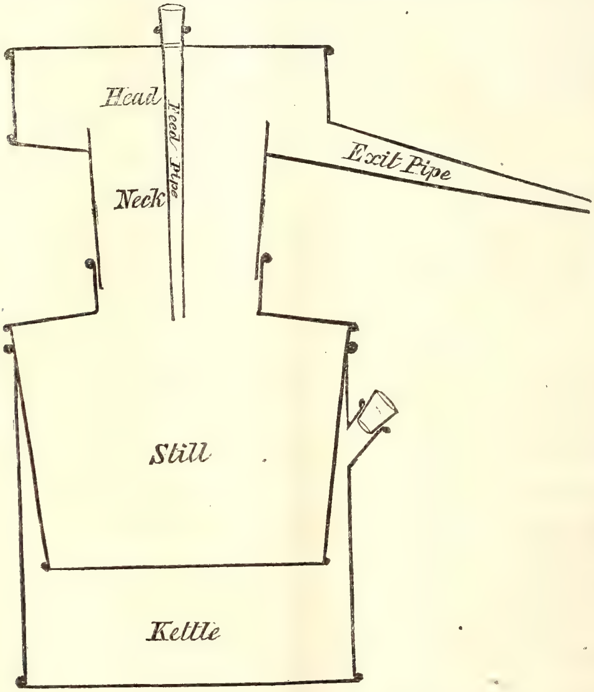
New Rat Poison.—The *Journal d'Agriculture Pratique* recommends artificial carbonate of baryta for the destruction of rats. This tasteless salt can be mixed with different aliments; it does not become poisonous until after the action of the gastric juice has given rise to soluble salts of baryta.—*Jour. de Chim. Méd., Nov.,* 1863.

ON THE MOST DESIRABLE FORM FOR A STILL FOR PHARMACEUTICAL PURPOSES.

By Thomas S. Wiegand.

Among the subjects to be reported upon at the meeting of our Association in 1862, was the most desirable form for a pharmaceutic still.

As the engagements of the member to whom it was referred prevented his reporting upon it, the subject was dropped at his request; this is especially to be regretted at the present time, as the high price of alcohol, and the introduction of so many fluid extracts into the Pharmacopœia, renders it more important than ever for the trade to recover it wherever practicable to do so. It was hoped by those of us who are familiar with the thorough manner in which Dr. Squibb does whatever he undertakes, that we should have a plan from him for a still that would combine the various requirements of our trade in an eminent degree. Without claiming to have succeeded in producing the most desirable apparatus, I think the experience of



more than two years with one very similar to that here described, enables me to recommend it as being very nearly what is required by the great majority of pharmaceutists. In arranging its several parts, the facility of cleaning it has been regarded as very important, and it is so designed that any good tinsmith can make it, while the usual pattern of copper stills requires a coppersmith to execute them.

The whole apparatus is made of sheet copper thoroughly tinned inside, the mouth of the still being large enough to admit the hand being introduced to clean it; the neck is made with a taper, so that it will close tightly, and of sufficient length to prevent the foaming, which frequently occurs, rendering the distillate impure; the neck is continued up into the head of the still a quarter of an inch to prevent the condensed liquor which forms in the head of the still flowing back into the still; the feed pipe enables the operator to continue the process with less interruption than would occur if the head were removed each time a new charge was added. As nearly all the use of the still in the hands of the apothecary is to recover alcohol from various preparations, it is desirable to have a safe means of applying heat: this can be done with great facility by means of a kettle, the diameter of which is a little less than the still at the shoulder, so that the still will form a close junction with it and prevent the free escape of steam. A still of this kind and size here described can be made for about four and a half dollars, the kettle for about two dollars more. It is far more economical to have them all made of copper tinned, as there is very little wear upon copper utensils, while the common, substitute, sheet tin, corrodes so quickly that in a short time a greater expense is incurred than would be required for copper vessels.

Proc. Amer. Pharm. Association, 1863.

ON THE ACTION OF SULPHUR ON AMMONIA.

By F. A. Fluckiger.

Gmelin and Rose state that pure sulphur has no action on ammonia; Brunner, however, has shown that ammonia water dissolves a little sulphur. Dry gaseous ammonia and vapors of sulphur, passed through a red-hot tube, yield, according to Thénard and Fourcroy, a mixture of different sulphurets. My own experiments show that no reaction takes place if sulphur is heated in gaseous ammonia merely to the point of volatilization.

Brunner's statements are correct. At ordinary temperature no solution is obtained, but at 60 to 65° C. the ammonia water is colored light lemon-yellow and precipitates, subsequently, in contact with the air, a minute portion of sulphur in an amorphous state, and too little to be weighed from 100 grammes of ammonia. The solution remains yellow if the air is absolutely excluded, but is not colored by nitro-prusside of sodium, and by plumbate of soda only faint reddish; it contains no sulphuret except a trace, after standing for several months hermetically sealed. If a large quantity of such an ammoniacal solution of sulphur is evaporated to dryness, and the residue treated with a little water, the filtrate shows all the reactions of a hyposulphite. Crystallized hyposulphite of ammonia, dissolved in water and boiled with sulphur, yields no yellow solution; the ammonia water must therefore be capable to dissolve a little sulphur at and above 60° C. This solution is altered in contact with the air the same as solutions of a sulphuret; sulphur is precipitated; another portion oxidized to S_2O_2.

The ammonia water used in the experiments above was prepared by the author, and perfectly pure. The flowers of sulphur, a commercial article, was washed with much distilled water, and the acid filtrate considerably concentrated, when it produced, with nitrate of silver, at once a purely white precipitate, which readily turned yellowish, brown, and finally black. The other usual reagents for hyposulphurous acid likewise proved its presence. This observation is remarkable, considering the instability of this acid, and proves the correctness of Rose's statement, that small portions of it may withstand decomposition for some time; in fact, it appears to keep unaltered for any length of time in commercial flowers of sulphur, if it is not reproduced in them.

Another experiment indicates a greater stability of hyposulphurous acid. A mixture of finely divided cadmium, sulphuret of cadmium, and pure sulphur, is well agitated with absolute alcohol and sulphurous acid; after the removal of the excess of the latter by evaporation, and of cadmium by sulphuretted hydrogen, the filtrate gives with lead a pure white, and with silver a white precipitate turning black. This reaction was observed after five months, but ceased to be produced after another month. Pentathionic acid, which might likewise have been formed, precipitates silver salt yellow.

The experiment with flowers of sulphur was repeatedly made. The wash-water, after careful concentration in a water-bath, yields with absolute alcohol a precipitate of a little gypsum and sulphate of ammonia; by the addition of ammonia, some ferric oxide is frequently precipitated. If this is omitted, and the evaporation continued to dryness, the hyposulphurous acid will be decomposed by the free sulphuric acid, which likewise blackens the residue from the presence of some organic impurities, and lime evolves ammonia, so that flowers of sulphur must contain a small proportion of an ammoniacal salt.

Hyposulphurous acid may frequently be detected even in well washed flowers of sulphur, also in sublimed or precipitated sulphur after crystallization from bisulphuret of carbon; even roll sulphur is not free from it and sulphuric acid, so that absolute purity of sulphur is not easily attained.

The hyposulphurous acid S_2O_2, being the lowest oxide, may probably originate by direct oxidation; the author, however, has been unable to obtain it by exposing pure sulphur to ozone (from KO, Mn_2O_7,) and to chlorine water, by slowly burning sulphur in a moist atmosphere, by evaporating water from it for several days, and by the spontaneous decomposition of solution of sulphuretted hydrogen. Still, it is possible that these experiments were undertaken on too small a scale, or not continued sufficiently long.

Hyposulphites, if searched for, will probably be frequently detected in natural products. Until now, hyposulphurous acid has been discovered only by Fellenberg, in 1849, in the water of the Gurnigel, in Switzerland, by Péligot, in the celebrated spring of Grenelle, and by Wittstein, in 1857, in the sulphur spring of Alle Prese, near Poschiavo.

Distilled water, enclosed with pure sulphurous acid and milk of sulphur in a sealed glass tube, and heated for several days to between 80 and 90° C., contains hyposulphurous acid; the same is found in water containing milk of sulphur in suspension, through which washed sulphurous acid is passed for some time. This proves the possibility of the formation of this acid by the simple addition of S to SO_2, and under conditions which are found still more favorable in the solfataras, lava, &c., of volcanic regions.

It remained now to be shown whether the hyposulphurous acid of the solution of sulphur in ammonia is formed by this reaction, or is merely dissolved out of the sulphur. But pure crystallized sulphur forms, under these circumstances, traces of hyposulphurous acid, more if the solution was effected in sealed tubes. Water of ammonia of ·885 sp. gr., heated to 90 or 100° C. in nearly filled glass tubes, with about one-third its weight of sulphur, soon turns deep brown-yellow, the sulphur disappears slowly, and saturation is attained if the liquid separates in the cold some octohedrons of sulphur. A brownish-red liquid, very dark at a higher temperature, is the result, which, like bisulphuret of chlorine (S_2Cl), extinguishes all the colors of the solar spectrum except red and orange, and separates slowly a little very fine carbonaceous matter. The solution smells chiefly of ammonia, and does not fume in contact with the air.

On opening the tube, a slight diminution of the tension is observed, and after pouring it out, the liquid almost solidifies from crystallizing sulphur. By the addition of water, or from a more diluted water of ammonia, a milky separation of sulphur takes place; but the liquid retains a brown-yellow color, and the separated sulphur is soluble in bisulphuret of carbon. If the concentrated solution is mixed with absolute alcohol, crystalline laminæ are separated in a short time, and the decanted liquor separates into a colorless supernatant and a lower red-yellow layer, which gradually deposits long needles, consisting of pure sulphur in a colorless state, and assuming the usual color by the application of heat. The mother-liquor from these crystals retains its red-yellow color much longer than the pure aqueous solution. The original solution, mixed with much alcohol and slightly heated in a retort, evolves hydrosulphate of ammonia, (most likely NH_3, 2HS,) which sometimes crystallizes in the neck in long colorless needles of little stability.

The solution obtained in a sealed tube, as stated above, whether saturated or not, containing little or much sulphur, yields a very intense coloration with nitro-prusside of sodium, and contains, even if very little sulphur has been used, principally higher sulphides of ammonium (NH_4S_5, and NH_4S_7); for it always gives the reactions of the polysulphides (see Am. Jour. Ph., 1861, 264), modified by the excess of ammonia.

The above saturated solution of sulphur, rapidly evaporated in a water-bath, leaves a yellowish residue of one-fourth its weight. Water leaves sulphur, and dissolves 30 to 32 per ct. of hyposulphite of ammonia $3\,(NH_4O,S_2O_2) + aq.$, the same salt that is precipitated by absolute alcohol from the fresh solution. It differs from Rammelsberg's salt of the same composition* by being less deliquescent, and by precipitating salts of baryta only after slight acidulation.

The reaction of sulphur on ammonia at 100° C. is probably as follows: $3\,(NH_3 + HO) + xS = NH_4O,S_2O_2 + NH_4S_5 + NH_4S_7 + S$ (sulphur in simple solution). It may vary with the concentration of the ammonia and the duration and temperature of the process, but the oxygen for forming S_2O_2 is undoubtedly derived from the oxide of ammonium. The solution of sulphur is effected by ammonia, but may be aided by the newly formed compounds. The saturated solution in ammonia of ·885 sp. gr. yields, by rapid evaporation, 7·7 per cent. of its weight of hyposulphite. The author suggests that this method of preparing hyposulphite might perhaps be profitably employed for technical purposes.

Under favorable circumstances, the behaviour of sulphur and ammonia to each other is identical with that of the other hydrated alkalies; and the formation of hyposulphite must be expected wherever sulphur and ammonia act on each other. If well crystallized $3NaS + AsS_5 + 15$ aq. is decomposed by acetic acid, and the precipitated AsS_5 carefully washed, it is wholly soluble in ammonia, but the solution soon separates sul-

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* Rammelsberg obtained 41·5 per cent., Fluckiger 39·07 per cent., of Sulphur. The formula $3\,(NH_4O,S_2O_2) + aq.$, requires 41.12 per cent S; $2\,(NH_4O,S_2O^2) + aq.$, contains 40·77 S and $NH^4O,S_2O_2 + aq.$, 38·55 S, while Arppe's anhydrous salt NH_4O,S_2O^2 requires 43·24 S. Fluckiger's salt is, therefore, probably the monohydrated hyposulphite of ammonia.

J. M. M.

phur; if evaporated, water dissolves from the residue hyposulphite, besides arsenite of ammonia.

Absolute alcohol saturated with ammonia, and heated in a sealed tube with sulphur, yields a dark-brown liquid, which has, with nitro-prusside of sodium, but a faint reaction on sulphide of ammonium. On evaporation, colorless or light-greyish crystals with a silvery lustre are obtained, and the mother-liquor evaporated to dryness furnishes a dark-brown residue, from which water takes up only questionable traces of hyposulphite. Its formation is, therefore, prevented by its insolubility in alcohol. The silvery crystals are pure sulphur; under the microscope they prove to be a mixture of a few globules and octohedrons, with thin monoclinic laminæ. Dissolved in bisulphide of carbon and evaporated, the yellow octohedrons are sometimes mixed with others, partly or entirely colorless.

Ammonia has also been treated in sealed tubes with selenium, tellurium, phosphorus and iodine. The former yields a colorless solution of little selenide and selenite; with tellurium, more tellurite of ammonia is obtained.

Amorphous phosphorus is not acted on by ammonia; the ordinary modification yields gradually ammoniated phosphoric oxide and phosphuretted hydrogen. If alcoholic ammonia is used in the experiment, the former is deposited in thin black films of metallic lustre, after drying apparently crystalline, but entirely amorphous under the microscope; thus obtained, it is not decomposed by boiling sulphuric acid or potassa.

Little iodine dissolves readily in ammonia, more yields at first iodide of ammonia, afterwards iodide of nitrogen. The tubes sustain the pressure well enough during heating in the water-bath, but the violent extrication of gas on opening either forces out the contents or fractures the tube.—*Wittstein's Viert. Schr.*, 1863, 321–332. J. M. M.

Berne, Switzerland, April, 1863.

THE GOLDEN PARALLELS.

In the late number of the *Edinburgh Review*, there is a notice of several publications on the subject of gold fields and gold miners. A mass of facts is collected relative to the Australian, California, and Columbian gold diggings, and several important conclusions are arrived at. In the first place, we are reminded that the great gold fields already discovered are all included within two regions. The gold fields of New South Wales and Victoria extend without any interruption along the slopes of the great mountain range which separates the eastern seaboard of Australia from the interior of the continent, and the gold fields of California and British Columbia occur without interruption along the western slopes of the Rocky Mountains. Thus, there are presented two great gold-bearing regions, extending along two widely distant elevations, and probably "owing their auriferous character to some influence connected with the upheaval." The possibility of establishing a connection between these two gold-bearing regions will be understood after a little consideration of their characteristics. The American gold fields, under various names, run along the eastern seaboard of the Pacific, almost from pole to pole—from Behring's Straits in the north to Cape Horn in the south. Throughout this vast region large quantities of the precious metal are found. "From Chili, in the south, to the British Possessions, in the north, its slopes, spurs, and subordinate ranges are now yielding gold. From Chili we mount through Bolivia, Peru, Equador, New Granada, all still continuing to yield the precious metal, after some three centuries of gold mining. Thence, after we pass the Isthmus, we find the gold miner at work through Mexico, California, Oregon, Washington, till at length we come to the British Possessions, stretching to the shores of the Arctic Ocean." Such is a brief description of the gold-bearing system of America. Turning now to that of Australia, there is found a coast range running from the extreme northern point of the continent to the extreme southern point. But this range neither begins nor terminates in Australia. It extends across Bass' Straits, on the one hand, and beyond Cape York on the other; in which direction the chain of rocks forms at intervals numerous islands, such as New Guinea, the Carolines, the Ladrones, and others, until Japan, with its gold-bearing rocks, is reached. Thus, in accordance with this theory, the basin of the Pacific has on each side a continuous elevation of volcanic origin. At intervals on both sides gold is now found, from Behring's Straits to New Zealand; and it is stated that at the "beach diggings" in California, a blush sand, not unlike the pipe clay of Ballarat, is frequently thrown up by the waves, and is found to contain gold in considerable quantities.

The conclusion arrived at by this reasoning is that the great gold fields of the world, as at present known, are included in the vast system of volcanic rocks which surround the Pacific. This chain, though broken here and there, is said to be traceable between Australia and America, and to be easy of identification on both sides of the ocean. Such a continuous and well-marked line of volcanic elevation has often received the attention of geologists. Humboldt's view, which is the one generally accepted on the subject, is that the bed of the Pacific attained its present depth at a comparatively late period; that its unbroken crust, pressed down on the molten mass underneath, caused a quantity of it to rush towards the line of fracture at the edges, and that this disturbed matter found vent in the elevations which are now connected with the gold fields of America and Australia. So far these considerations, as bearing on the science of geology, are highly important; but it has to be shown in what way gold is to be connected with volcanic shocks in some places and not in others. On this point it is to be laid down by Sir Roderick Murchison that the rocks which are the most auriferous are of the Silurian age, and that a certain geological zone only in the crust of the globe is auriferous at all. Gold, he states, has never been found in any stratified formations composed of secondary or tertiary deposits, but only in crystalline and palæozoic rocks, or in the drift from those rocks. The most usual original position of the metal is in quartzose veinstones that traverse altered Silurian slates, frequently near their junction with eruptive rocks. Sometimes, however, it is partially diffused through the body of rocks of igneous origin. From this it appears that volcanic eruptions, in connection with Silurian rocks, are to be regarded as the origin of gold formations.

It will have been seen that, according to the volcanic basin theory as described above, the auriferous rocks which surround the Pacific leave Victoria and plunge into the sea to appear again on the other side of Bass' Straits. This would, of course, leave South Australia out of the reach of these gold-bearing ranges. But singularly enough, the reviewer, after remarking upon this termination of the Victorian rocks, refers to the geological work of Mr. Julian Woods in order to show a curious extension of the volcanic action which is to be "traced in South Australia." On referring to the extract, however, it appears that Mr. Woods' reference is not to South Australia, although it relates to the country close upon its border. Mr. Woods says:—"At about fifty miles east of Mount Gambier, on the Victorian side of the boundary, there commences an immense volcanic district, which may be traced with very little interruption to Geelong by immense masses of trap rock and extinct craters of large dimensions. This kind of country extends considerably to the north of the line, and it is underneath the trap rocks there found at the junction of the Silurian slates and ancient granites that the extensive Australian gold-fields are worked."

Another extract is given from Mr. Woods' book, embodying a statement similar to that which has been already quoted from Sir Roderick Murchison, namely, that trap rock and other indications of volcanic eruption are no guide to the presence of gold, unless in the neighborhood of Silurian rocks.—*Journ. Frank. Inst. Oct.* 1863, *from Jour. Soc. Arts.*

NOTE ON FORMOSA CAMPHOR.

BY ROBERT SWINHOE, F. G. S. ETC., H. M. CONSUL AT TAIWAN.

The manufacture of this article has for some years been monopolized by the Taotai (or head Mandarin) of the island, and its sale farmed out to wealthy natives. In former years, a good deal of the drug was clandestinely produced, and smuggled across to China, where it was largely bought up by foreign speculators, and carried to Hongkong for shipment to Calcutta, at which place it finds the readiest market, being used by the natives of Hindostan for lubricating the body and other domestic purposes. But now its monopoly is so closely watched that almost the entire trade in it falls to the lucky individual whose Chinese agents can secure the monopoly. This bad system has occasioned the price of the article in Hongkong to increase considerably in value, and to make the profits accruing to the fortunate monopolist almost fabulous. The cost of the drug, I learn, amounts to only six dollars at its place of manufacture. The monopolist buys it from the Mandarin at 16 dollars the pecul, and sells it in Hongkong at 28 dollars. The gigantic laurel (*Laurus Camphora*) that yields the camphor, covers the whole line of high mountains extending north and south throughout Formosa. But as the greater part of this range is in the hands of the aborigines, the Chinese are able to gain access only to those parts of the mountains contiguous to their own territories that are possessed by the more docile tribes. The trees, as they are required, are selected for the abundance of their sap, as many are too dry to repay the labor and trouble of the undertaking. A present is then made to the chief of the tribe to gain permission to cut down the selected trees. The best part of the tree is secured for timber, and the refuse cut up into chips. The chips are boiled in iron pots, one inverted on another, and the sublimated vapor is the desired result. The camphor is then conveyed down in carts of rude construction, and stowed in large vats, with escape-holes at the bottom, whence exudes an oil, known as *camphor-oil*, and used by Chinese practitioners for its medicinal properties in rheumatic diseases. Samples of this oil have been sent home, and it may eventually become a desideratum in Europe. From the vats the camphor is stowed in bags to contain about a pecul each, and is thus exported. The Chinese government has empowered the Formosan authorities to claim on its account all the timber produced by the island for ship-building purposes; and it is on this plea the Taotai appropriates the prescriptive right of dealing in camphor. About 6000 peculs of the drug are annually produced in the neighborhood of Tamsuy.—*Pharm. Journ., London, Dec.,* 1863, *Extracted from Paper read before the British Association at Newcastle.*

ORIGIN OF VARIETIES IN PLANTS.

According to the Gardeners' Chronicle, quoting from *Les Mondes*, "M. Decaisne, the very able Professor of Cultivation in the Garden of Plants, Paris, has lately brought under the notice of the Academy of Sciences some very interesting remarks upon the varieties of cultivated plants in general, and of Pears in particular." Decaisne remarks;—"The almost unlimited and ever increasing number of varieties in fruit-trees, vegetables, and all useful plants is a fact to which science has at present given too little attention. . . . These new forms, what are they? Can they be, as has been recently asserted, true species which have remained unknown up to the time when they were first subjected to cultivation; or are they merely modifications of ancient known species, assuming various appearances according to climate or situation? It may appear strange that such a question should be brought before the Academy, so natural does it seem for a species to be subject to change." . .

Botanists in the present day may be divided into two schools. The more ancient, which may be called the Linnæan, admits the changeableness of species; within certain limits, no doubt, though it is not always easy to define them. Hence those large polymorphous species, sometimes vaguely defined, but generally easy to characterize by a short descriptive phrase. The other school, which belongs especially to our own time, and which may be designated as the school of immutability, denies most positively any tendency to variation in the vegetable kingdom. According to it, the forms of species never alter in the slightest degree; and when two plants of the same genus present any palpable difference, however slight it may be, these two plants form two species, radically distinct from the beginning of things. According to M. Jordan, of Lyons, a very eloquent advocate of the modern school, all the races and all the varieties admitted by the ancients become so many species. In his eyes, all our races and all our varieties of fruit-trees, of Pears amongst others, are distinct, unchangeable species, always preserving their own characteristics from generation to generation. Hence it follows that these trees did not proceed, as is commonly believed, from a single or even from a few specific types, which cultivation has caused to vary, but from as many original types as there are perceptible varieties."

Although the absurdity of the latter view seems evident enough, Decaisne proceeds to refute it, by the record of his observations and experiments. He has raised seedlings from four very different varieties of Pears, and each of the four gave rise to a considerable number of new varieties, as different from each other and from their mother, as she was from the greater part of our old varieties. "It is not only in the fruit that trees raised from the same seed differ; but also in the time of their ripening, general appearance, and in the form of their leaves. . "Some have spines, some have none, some have slender wood, in some it is stout and coarse. Upon some of the seedlings of the old *Poire d' Angleterre* the variation went so far as to produce lobed leaves, like those of the Hawthorn or of *Pyrus Japonica*. Everything varies in the Pear-tree, even to its sap. As proof of this observe the very different success of the graft, according to the stocks employed. All the varieties and races of Pear-trees bear grafting upon a Pear-tree, that is to say, upon the wild Pear-tree; but all will not take upon the Quince, as for example the *Rance*, *Clairgeau*, *Bosc*, *Duchesse de Mars*, &c." The flowers also showed very striking variations. As to size of fruit the transition is said to be perfect from the wild Pear of Blidah, which is only the size of a pea, to the *Belle d' Anguine* and *d'Amour*, which vie with a melon of middling size.

That these extreme forms belong to different species which have crossed and recrossed thousands of times with each other, producing fertile hybrids, &c., Decaisne will not allow to be probable. But it would be difficult to disprove it. He admits the crossing, but maintains that the constant fertility, after every conceivable cross, argues identity and not diversity of species.

"Does the graft, as some people maintain, alter the character of the variety?" He concludes it does not. "The notion that fruit-trees degenerate because they are propagated by grafting is an error which must be exposed. There is no single fact to prove it. Those which have been cited depend upon totally different causes, first and foremost among which are climate, unuitable soil, and very often bad cultivation or a neglect of pruning, so common now-a-days. Our ancient pears, which a century or two ago were so justly esteemed, are now exactly the same as they ever were; they ripen at the same time and keep good just as long. . . The pretended degeneracy of ancient races is really nothing more than one of the clever devices of the present day."

"On the other hand, can it be true, as Van Mons and many pomologists believe, that the pips of a good fruit produce wild austere fruit, and thence return to what they suppose to be the specific type? I do not hesitate to declare the contrary, and I defy any one to bring forward an example of a good fruit, whose flowers were fertilized by their own pollen, or by that of any of their own race, whose seed has produced wild fruit. . . . It may be considered certain, that all superior varieties of the Pear-tree, and I may say of all fruit-trees, if they are fertilized by themselves, produce good fruit. They may vary, and will probably do so, sometimes in one peculiarity and sometimes in another, according to the variety; but none will become wild, any more than our seedling Cantaloupe melon return to form and flavor of the little wild melons of India, or than our Cabbages and Cauliflowers return to some one of the wild races that grow on the sea-shore. Whatever the advocates of immutability may say, the species of plants are really subject to great variation; and there is much truth in the theory which refers to the same specific type, races and varieties which, though very different in appearance, have the same morphological organization, and which, like the members of the same family, are capable of crossing with one another . . . Take any one of our races of Pear-trees, and transport it to all the regions of the globe; wherever it can exist, it will struggle to adapt itself to the situation, and after a few generations it will have given birth to new and numberless varieties. This fact, which takes place under our own eyes, in the case of every cultivated plant that is much distributed over the world, gives the key to those polymorphous species which perplex botanical classifiers, and which have only become what they are by nature herself having spread them over an immense expanse of country."

We remark, 1, that a view which we have more than once referred to, *i. e.*, that variation is a result of domestication, and that there are no wild varieties (a view which essentially coincides with that of Jordan, as stated above), is sufficiently refuted by Decaisne's experiments. For one of the four Pears of his experiments, the *Sauger* is a wild variety, or nearly so, and its seedlings were not behind those of the other sorts in amount of variation. And 2, although no varieties may not have yet been shown to *degenerate* while duly cared for, under continued propagation from buds, it does not follow that they would *continue to exist* in perpetuity. It can hardly be otherwise than that the *existence of a species* is prolonged bv sexual reproduction as it would not be by budding, or sex lesspropagation.—A. G.

Am. Jour. Sci. and Arts, Nov. 1863.

REMARKS ON LEMON-JUICE AND ITS PRESERVATION.

By Charles Symes.

The fact that prescriptions, ordering alkaline mixtures to be taken effervescing with lemon-juice, are often accompanied by instructions that "the lemon-juice is not to be sent," is both unpleasant and unprofitable. Unpleasant, as indicating suspicion on the part of the prescriber that the dispenser will not faithfully discharge his duty, in sending exactly what is prescribed, and thus weakening the confidence of the patient; unprofitable, as it deprives the pharmaceutist of a portion of his legitimate profit. Now as there can be no effect without a cause, so there must be a reason why the above instructions are so frequently received, and it appears to be just this:—Lemon-juice will not keep for any length of time if simply strained and bottled. Pereira and Royle, after stating this, give formulæ for its *artificial* preparation, and there can be no doubt that a substitute so prepared is largely used. This, in dispensing, is about as justifiable as extemporizing Inf. Cinchonæ by an aqueous solution of quinine and cinchonine. Yet who would countenance the latter? Royle also states that "druggists in this country preserve it (the fresh juice) by adding $\frac{1}{10}$ of spirit of wine, and filtering off the mucilage." Spirit is highly objectionable in cases for which effervescing mixtures are usually prescribed, therefore this also would be inadmisible for dispensing purposes.

Undoubtedly, in some establishmments, lemon-juice is preserved in the manner I am about to mention, but it is quite certain that in very many it is not; and they either follow one of the above practices, or make the necessary delay of procuring and pressing lemons, and straining the juice when required.

The process Mr. Alsop recommends, and Dr. Redwood has frequently advocated for the preservation of infusions, applies equally to lemon-juice,—viz.: heating to the boiling-point, and excluding the air by carefully closing the full bottles at this temperature. Thus prepared it keeps well for more than twelve months, but early last winter I made some experiments to ascertain if ebullition were really necessary, and I find it is not; juice heated only to 150° and excluded from the air at that temperature, is now in a perfect state of preservation. I cannot say, however, that this holds good if it be bottled during the summer months; in fact, my experience indicates otherwise.

This might arise from the juice, when expressed, being in an incipient state of change, as it is well known that lemons are very prone to decay at this season, and microscopic organisms being in a more vitally active condition than during the winter, are probably capable of sustaining a high temperature for a short period; and thus, although the heat applied might retard, it does not totally destroy the tendency to decomposition.

If a little care is exercised, stoppers or perforated corks are unnecessary, common corks answer quite well; and for covering the tops of these (when cut off), I think bees'-wax will be found superior to sealing-wax, as it adheres firmly and is not so liable to crack.

I would then suggest, that if a ten or twelve months' stock of lemon-juice is thus bottled at a temperature not necessarily above 150° *during the winter*, the dispenser would be enabled without delay to send it out in a state even superior to that freshly obtained from the fruits; and this being generally adopted would give satisfaction both to prescriber and patient. —*Pharm. Jour.*, *London*, *Oct.*, 1863.

THE COMPASS PLANT.

By T. Hill.

Riding near Chicago, August 8, 1863, I saw, for the first time, *Silphium laciniatum* growing wild. The field had once been ploughed and sown with timothy, and there was a grove a few rods to the east. Notwithstanding these unfavorable circumstances, I took a rough measurement of thirty plants, without selection, as follows: Holding a card over each plant with its edge parallel to the central line of my own shadow, I marked upon the card a short line parallel to each leaf of the plant. Measuring afterward the angle which each mark made with the edge of the card, and subtracting from each angle the azimuth of the sun for the estimated central time of observation, I obtained the following results. Only one plant, bearing four old leaves, gave an average angle with the meridian of more than 34°. Their mean was 18° west. The remaining 29 bore 91 leaves; which made with the meridian the following angles,—viz.: Seven made angles greater than 35°; fifteen, angles between 35° and 20°; sixteen, angles between 20° and 8°; twenty-eight, angles between 8° and 1°; and twenty-five, angles less than 1°.

Of the 69 angles less than 20° the mean is N. 33′ E., i. e. about half a degree east of the meridian. The error of azimuth, from my want of means to determine the time accurately, may have been as much as three times this quantity. One half the leaves bear within about half a point of north, two-thirds within a point.

The magnetic declination was about 6° east. The observations were made when the sun was about on the magnetic meridian.—*Am. Jour. Science and Arts*, *Nov.*, 1863.

PRELIMINARY NOTICES OF A NEW METAL.

By F. Reich and Th. Richter.

The authors have found a new metal in two Freiberg ores, which were composed principally of arsenical pyrites, blende, and some galena, together with silica, manganese, copper, and a small proportion of tin and cadmium. The ores were first roasted to get rid of the greater part of the arsenic and sulphur, then mixed with chlorhydric acid, evaporated to dryness and distilled. The impure chloride of zinc obtained was examined with the spectroscope for thallium. No green line was seen, but the authors remarked an indigo-blue line, which was before unknown.

The authors succeeded in isolating the conjectural substance, necessarily in very minute quantity, partly in the form of chloride, partly as hydrated oxide, and partly in the metallic state. On submitting these, moistened with chlorhydric acid, to the spectroscope, the blue line was seen so brilliant, sharp, and persistent, that they did not hesitate to conclude that it belonged to a hitherto unrecognized metal, to which they accordingly gave the name *Indium*.

The line mentioned has a perceptibly greater refrangibility than the blue line of strontium, and there appears besides a much weaker line, of still greater refrangibility, which almost, but not quite, reaches the blue line of calcium.

The authors add that, as far as they have examined the chemical properties of *Indium*, they may safely assert that it is not precipitated from an acid solution of the chloride by sulphuretted hydrogen; that from the same solution it is precipitated by ammonia as a hydrated oxide; that the chloride is extremely deliquescent; and that the oxide heated on charcoal with soda gives lead-gray metallic beads, which are ductile and very soft; these heated again before the blowpipe give a yellowish coating, which on further heating takes no characteristic color with cobalt solution.—*Chemical News, Sept.* 12, 1863, *from Journal für Praktische Chemie,* lxxxix., 441.

NEW METHOD FOR THE CONCENTRATION OF MINERAL WATERS.

Sea-water, in freezing, forms flakes of ice consisting of nearly pure water, and an extremely saline liquid which in Northern countries is utilized in the production of marine salt. Very recently, Dr. Robinet, a physician of Paris, has discovered that the same process can be applied in the purification of fresh water. In freezing water from the Seine, from wells, and from springs, he found the ice produced to be so entirely free from the salts of lime and magnesia which were contained in the water, that, thus purified, it may be considered as nearly equal to distilled water. So it is now proposed to procure water on board ships, no longer by distillation but by congelation, by by means of the apparatus of Mr. Carré, of which mention is made below.

The same fact is made use of in the concentration of mineral waters, a problem which has offered itself for a long time, but which the employment of heat could not solve, on account of the gas originally in solution, which the heat expelled. Cold works better. Dr. Ossian Henry, of Paris, has experimented with forty different varieties of water, and finds that it is possible by congelation, to reduce mineral waters to one-eighth, one-tenth, one-fifteenth, or even one-twentieth of their original volume, without producing any alteration in the gases contained in them.

100 litres of mineral water can thus be reduced to 5, giving great economy in transportation; moreover, the ice itself is also valuable. But we do not believe that the therapeutic properties of the extract will be identical with those of the water in its original state, because of the changes which manifestly take place in the contained salts, changes so evident that Mr. Balard has been able to base upon them a manufacture of sulphate of soda, by exposing to a temperature sufficiently low the waters containing $NaCl$ and MgO, SO_3, which result from the manufacture of sea-salt by the evaporation of sea water.

The publication of this process has given occasion for a protest on the part of Mr. Tichon, an apothecary of Aix les Bains (Savoy), according to which the same process has been used since 1856, by him and a Mr. Melsens, who was staying at Aix for his health. The mineral water which he drank here, and which is sulphurous, proving disagreeable to his taste, he undertook to remove part of the odor by submitting it to a freezing mixture. In this way he was able, not only to mask the disagreeable odor, but also to concentrate the mineral ingredients.

Mr. Tichon adds that congelation will not suit all mineral waters, inasmuch as it alters the organic matter therein dissolved.—*Am. Journ. Science and Arts, Nov.*, 1863.

LIQUID PERMANGANATE OF POTASH.

M. Leconte prepares this solution in the following manner: Caustic potash, six drachms; chlorate of potash, five drachms;

binoxide of manganese, five drachms. Dissolve the caustic potash and the chlorate in a small quantity of water, and add the manganese; get rid of the water by evaporation, stirring constantly, and calcine the dry mass to a dark red for an hour in an untinned iron cup; allow to cool, and add a quart of plain water. Then boil for five minutes in a china capsule, and you will obtain a fluid of a slightly purplish tint; decant the solution, and wash the residue with such a quantity of water as to make altogether two quarts. When filtering is thought necessary, the liquid should be passed, not through paper, but through very fine sand. For dressing foul wounds, or for injecting, use one drachm of this solution to from three drachms to five of spring water.—*Am. Jour. Med. Sciences, Oct.*, 1863, from *The Lancet, August* 22, 1863.

ON SOME NEW VOLATILE ALKALOIDS GIVEN OFF DURING PUTREFACTION.

Dr. Crace Calvert communicated under this title to the Royal Society (Feb. 1860) the preliminary results of some investigations on the product of putrid wounds, with reference to the contagion known as hospital gangrene. We have waited the conclusion of his research, but as it has not yet appeared we give the main points of his first paper. Failing to obtain a sufficient supply of the products emanating from putrid wounds, he arranged, in each of a number of small casks, twenty pounds of meat and fish, mixed with pumice stone to prevent clogging. Two tubes were adapted to the top of each cask, one of which supplied air, which was drawn through the other from near the bottom of the cask by an aspirator. The air in its passage passed through two bottles containing chloride of platinum, which was soon made turbid by the production of a yellow amorphous powder. This precipitate collected, washed with water and alcohol, and dried, was found by analysis to contain carbon, hydrogen, and nitrogen, but what was remarkable, sulphur and phosphorus also entered into its composition. The amount of these elements determined quantitatively was 11 per cent. for the sulphur and 6·01 per cent. of phosphorus, of the whole precipitate. By heating a quantity of the platinum salt with a strong caustic ley, a liquid, volatile and inflammable alkaloid was obtained, whilst sulphur and phosphorus remained combined with the alkali, and were easily detected. The author is satisfied, from twelve months' research, that no sulphuretted or phosphoretted hydrogen was given off, and his researches tend to prove that the noxious vapors given off during putrefaction contain the nitrogen, sulphur, and phosphorus of the animal substance, and that these elements are not liberated in the simple form of ammonia, and sulphuretted and phosphoretted hydrogen. As putrefaction proceeds, different volatile bodies are given off. The platinum salts, heated in test tubes, give off vapors, some acid, some alkaline, of a most noxious and sickening odor, resembling putrefaction, while a white crystalline sublimate is formed, which is not sal-ammoniac. These researches are still in progress, and will occupy several years.—*Am. Journ. Science and Arts*, *Nov.*, 1863.

ON THE EXTRACTION OF THALLIUM ON A LARGE SCALE FROM THE FLUE DUST OF PYRITES BURNERS.

By W. Crookes, F. R. S.*

All the processes for the extraction of thallium hitherto published by myself and others have been applicable to but small quantities of the material from which the metal is obtained. They have in most cases directed the employment of distilled water and porcelain basins, and have involved the passing of sulphuretted hydrogen through filtrates—a method of proceeding altogether out of the question when large quantities of deposit are to be dealt with. Having for many months past been occupied, in conjunction with Messrs. Hopkin and Williams, manufacturing chemists, of Wandsworth, on the extractum of the metal from an amount of material far greater than has ever been treated before, I propose to bring before the meeting an account of the methods we have ultimately adopted.

I have received from various quarters some hundreds of specimens of deposit, flue dust and minerals, every one of which was first of all carefully tested for thallium by means of the spectroscope. The practical employment of spectrum analysis

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* Read before the British Association at Newcastle-upon-Tyne, September 1, 1863.

is, I regret to say, of but very limited use, and has caused me many disappointments before I finally determined to abandon it, except by way of confirmation in subsequent experiments. The spectrum by itself gives no indication of quantity. The green line produced by a residue containing but one part of thallium in a thousand is as vivid and distinct as the line given by the pure metal, and therefore, before I could decide whether a deposit contained sufficient thallium to repay for its extraction, it was necessary to make an estimation in the moist way by exhausting a weighed quantity of the dust with water, and adding hydrochloric acid to the solution. Associated with thallium in these deposits is unfortunately a variety of other metals, which render the separation of the thallium in a pure state a rather difficult matter. Amongst these metals I have found mercury, copper, arsenic, antimony, iron, zinc, cadmium, lime, and selenium, together with ammonia, sulphuric, hydrochloric, and nitric acids.

In a lecture delivered at the Royal Institution of Great Britain on Friday evening, March 27, 1863, I referred to a curious parallelism between the discovery of selenium and that of thallium. The great Swedish chemist, Berzelius, was engaged in the examination of a residue for tellurium, when he found a hitherto unknown metalloid, to which he gave the name of selenium. In my own case a very similar residue was also being examined for tellurium by means of the spectroscope, when I first noticed the green line which led me to the discovery of thallium. Soon after the publication of that lecture, Dr. Alfred Swaine Taylor was kind enough to send me a powder which is beyond doubt a portion of the identical residue in which Berzelius found selenium. The original specimen is preserved in the laboratory of Guy's Hospital, in a bottle labelled as follows:—

"Mixture containing selenium from the Gripsholm Works in Sweden. Sent by Professor Berzelius to William Allen in 1820."

William Allen was formerly lecturer on chemistry in Guy's Hospital. The powder was given to Dr. Taylor by Mr. Daniel Hanbury some years since. The authenticity of the specimen is thus placed beyond a doubt. It is of especial interest to be enabled to decide positively whether thallium was present or absent in the mixture in which Berzelius discovered selenium. This I am now able to do. I have examined the specimen sent by Mr. Taylor with the most scrupulous care in the spectroscope, but have been unable to see the faintest trace of the green line. Had thallium been present it would scarcely have escaped the keen observation of Berzelius—that most acute and persevering of modern chemists.

Amongst those manufacturing firms to whom I am indebted for flue dust, my thanks are especially due to the Walker Alkali Company and Messrs. Allhusen and Sons, of this town, Mr. Spence and Messrs. Roberts, Dale, and Company, of Manchester, Messrs. Chance Brothers, and Adkins and Company, of Birmingham, the Metropolitan Alum Company, of Bow, and Messrs. Wilson and Son, Glasgow. From each of these firms I have received every assistance which I could desire, in specimens from different parts of the flues, and their entire stock of thalliferous flue dust, varying in quantity from one or two up to thirty cwts. Were I to mention those who have kindly forwarded me specimens—unfortunately containing no thallium—I should have to give a catalogue of half the chemical works in the kingdom. My thanks are particularly due to J. Lowthian Bell, Esq., Mayor of Newcastle, for the handsome present of an ingot of thallium, weighing half a pound, prepared at his aluminium works at Washington.

The flue dust upon which we have as yet operated amounts to about five tons, the whole of which has been treated by the method I am about to describe. Some of the gentlemen I see around me who are in the daily habit of dealing with much larger quantities of materials, may perhaps smile at the mention of difficulties of manipulating such an amount, and yet even in the well-appointed laboratory of Messrs. Hopkin and Williams, and with the valuable personal superintendence of these gentlemen, the difficulties have been very serious. In the first place, the whole of the material had to be boiled in water and then filtered. As a matter of course the filtrate is extremely acid, and notwithstanding the most careful watching, the filters would occasionally break, and a considerable loss of material ensue. Then again, when the liquor is left to deposit, so that the thallium solution may be decanted, the residue occasionally sets into a hard compact mass, which expands in cooling, and splits the vessel in which it is placed. In this way we had the misfortune to lose many pounds of metal; three twenty-gallon pans have been broken in one night. Further, the choice of a vessel in which the material could be boiled was a matter of some difficulty. Enamelled iron vessels, which seemed to offer the best means, were found to be very objectionable. The acid solution rapidly destroyed the enamel, and the thallium was then precipitated upon the exposed iron. These are a few of the difficulties which we had to encounter in the early stages of the proceedings ; but they have happily been surmounted, and the process I am about to detail is one by which any manufacturer, bearing in mind the facts I have just stated, may set about the extraction of thallium on as large a scale as he may deem desirable.

The process which is at present adopted at Messrs. Hopkin and Williams's laboratory is as follows :—The thalliferous dust is first treated in wooden tubs with an equal weight of boiling water, and is well stirred ; during this operation a considerable quantity of nitrous acid is evolved ; after which the mixture is allowed to rest for twenty-four hours for the undissolved residue to deposit. The liquid is then syphoned off, the residue is washed, and afterwards treated with a fresh quantity of boiling water. The collected liquors, which have been syphoned off from the deposit, are allowed to cool, precipitated by the addition of a considerable excess of strong hydrochloric acid, and the precipitate, consisting of very impure chloride of thallium, is allowed to subside. The chloride obtained in this way is then well washed on a calico filter, and afterwards squeezed dry. I may mention that from three tons of the dust I obtained 68 pounds of this rough chloride.

The next step in the process with this large quantity is necessarily a tedious one. It consists in treating the crude chloride in a platinum dish with an equal weight of strong sulphuric acid, and afterwards heating the mixture to expel the whole of the hydrochloric acid. To make sure of this, the heat must be continued until the greater part of the excess of sulphuric acid is volatilised. After this the mass of sulphate of thallium is dissolved in about twenty times its weight of water, and the solution filtered. On the addition of hydrochloric acid to this solution, nearly pure chloride of thallium is thrown down ; this is collected on a calico filter, well washed, and then squeezed dry.

The object of the process so far has been to obtain a tolerably pure chloride ; but as thallium is most easily reduced to the metallic state from the sulphate, it is now necessary to again convert the chloride into sulphate. For this purpose we add the dry chloride gradually to hot sulphuric acid, using four parts by weight of strong acid to six parts of the chloride. The mixture so obtained is heated strongly until all the hydrochloric acid is expelled, and the residue assumes the form of a dense liquid. This, being set aside, solidifies on cooling to white crystalline mass. When this is dissolved in water an immense amount of heat is evolved, and great care must be taken to avoid breakage of the vessels. The best way of dissolving it is to add it slowly to ten times its weight of hot water. A solution is thus obtained, which must be filtered, and on being concentrated and set aside to cool, crystals of sulphate of thallium will be obtained, which may be rendered quite pure by re-crystallisation, a little hydrosulphuric acid being previously added, if necessary, to separate arsenic, mercury, &c.

The final step in the process is the reduction of the metal from this sulphate. Many ways can be adopted for the reduction when only a few ounces are under experiment; but when the quantity of crystallised salt is from a quarter to half a hundredweight, a process must be devised which will admit of considerable quantities being reduced without too much expenditure of time or trouble. Experiments in the dry way were not very successful. No difficulty was experienced in partially reducing the metal by igniting the sulphate with black flux, or with cyanide of potassium, in a clay crucible; but I could not remove all the sulphur in this way. When sulphate of thallium is projected into a crucible containing fused cyanide of potassium there is an immediate reduction to the state of protosulphide, which forms a brittle, metallic-looking mass, of the lustre of plumbago, and fusing more readily than the metal.

A few cells of Groves' batteries offer a most ready means of reducing the sulphate, and in quantities less than half a pound nothing can be simplier than the electrolytic process.

For reducing the metal in quantity I found no plan so good as its precipitation with metallic zinc. Plates of pure zinc (which must leave no residue whatever when dissolved in sulphuric acid) are arranged vertically round the sides of a deep porcelain dish holding a gallon. About seven pounds of crystallised sulphate of thallium are then placed in the dish, and water poured over to cover the salt. Heat is applied, and in the course of a few hours the whole of the thallium will be reduced to the state of a metallic sponge, which readily separates from the plates of zinc on the slightest agitation. The liquid is poured off, the zincs removed, and the spongy thallium washed two or three times. It is then strongly compressed between the fingers, and preserved under water until it is ready for fusion. The fusion of the metal is readily effected. An iron crucible is placed over a gas-burner, and a tube is arranged so that a constant stream of coal gas may flow into the upper part of the crucible. Lumps of the compressed sponge are then introduced, one after the other as they melt, until the crucible is full of metal. It is then stirred up with an iron rod, and the thallium may either be poured into water and obtained in a granlated form, or cast into an ingot. Thirty or forty fusions have been performed in the same crucible without the iron being acted upon in the least by the melted thallium. The products of these fusions were ultimately melted together and cast in an iron mould. The result is the accompanying bar of thallium, weighing a quarter of a hundredweight.

Thallium contracts strongly on cooling. The coating of tarnish which it acquires while hot is instantly removed by water, which renders the surface perfectly bright. The liquid metal in the crucible, when protected by the stream of coal gas, can scarcely be distinguished from mercury. Thallium is not absolutely identical in color with any other metal, but approaches nearest to cadmium and tin. It has perfect metallic lustre. Its specific gravity is 11·9. It is very malleable, but not very ductile. It can only be drawn into wire with great difficulty, but by the operation technically known as squirting, thallium wire may be formed most readily. Thallium is very soft, being only exceeded in this property by the alkali metals. A point of lead will scratch thallium with the greatest readiness. Thallium possesses the property, in common with soft metals, of welding by pressure in the cold. Rubbed on paper, it gives a dark streak, having a yellow reflection, which in a short time nearly fades out, but may be restored with an alkaline sulphide. Thallium is strongly diamagnetic, being in this respect nearly, if not quite, equal to bismuth. It melts at 550° F., and distils at a red heat, evolving brown vapors into the air at a temperature little above its melting point. When a minute fragment of thallium, or of any of its salts, is introduced into the flame of a spirit lamp, it colors it of a most intense green, which, when examined by means of a spectrum apparatus, appears to be absolutely monochromatic, communicating one single green line to the spectrum. This property of the metal is now too well known to require further remarks; from it the name thallium was chosen.

A magnificent green fire for pyrotechnic purposes can be made with—

Chlorate of thallium 8 parts,
Calomel 2 parts,
Resin 1 part.

The chlorate of thallium is a beautiful crystalline, difficultly soluble salt, which may be prepared by dissolving the metal in chloric acid, or by mixing together saturated aqueous solutions of chlorate of potash and nitrate of thallium. It is anhydrous.

At the present price of thallium, its employment for pyrotechnic purposes would be out of the question; but a very little reduction in price would enable its magnificent green flame to be advantageously employed for ship signals, as the extraordinary intensity and monochromatic character of the light would enable it to penetrate a hazy atmosphere without the change of color suffered by the ordinary green lights in which baryta is used. The atomic weight of thallium is 203. This result, however, is not deduced from sufficiently accurate analyses to render it entirely trustworthy, and I am now engaged in determining the equivalent in a more accurate manner. The physiological action of thallium is a matter of some doubt. I cannot say that it has produced any particular effects upon me, although I have been much exposed to the action of its fumes during the last few months, and have occasionally swallowed a grain or two of its salts. The only effect which I have noticed, besides the staining of the hair and nails, is a corrosive action which the sulphate has on the skin, burning the hands and rendering the epidermis yellow and horny. In this respect it acts like mercury salts.

Several thallium salts are sensitive to light. The protochloride and double phosphate of thallium and ammonia are especially so.—*Chem. News, London, Oct. 3d,* 1863.

SCHEELE AND HIS DISCOVERIES.

(Translated and arranged from the Memoir of M. Cap.)

BY MR. JOSEPH INCE.

Certainly not in this Journal should the life and labours of Scheele be unnoticed. His career is a bright example of how far the mind may triumph over external difficulties, and of how little value are adventitious aids when genius is linked with perseverance. To us especially as Pharmaceutists must the record be of interest, teaching, as it does, that nothing is denied to patient industry, and that the loftiest results have been, and therefore may be again within the grasp of the man who has to earn his bread by the humblest plodding behind a Druggist's counter.

Charles William Scheele was born at Stralsund, December 9th, 1742. Stralsund is a town in Swedish Pomerania, and now belongs to Prussia. He was the son of a small tradesman, burdened with a numerous family. His father placed him with a M. Bauch, an old family friend, an apothecary at Gottenburg. Apprenticeship in Sweden lasted generally six years, at the expiration of which the apprentice took the title of "garçon," and later on, that of assistant (*aide-apothicaire*). Scheele's classical studies had been painfully limited, and his first essays in Pharmacy were more painstaking than successful. He was a laborious reader of works relating to his profession, especially those of Neumann, De Lemery, De Stahl, and one of Kunckel's, called "The Laboratory"; and he often worked out at night experiments that the day's study had suggested. One word will best describe him—diligent. After some years' stay with M. Bauch he went to Malmöe, in Scania, where he spent five years with another pharmacien, M. Kaelstroem. There, in silence and retirement, he devoted himself to the deep and serious study of Chemistry. In 1767 he went to Stockholm, became assistant to M. Scharenburg, superintendent of Pharmacy, and stopped there three years; after which he went to Upsal, where Bergmann was a celebrated professor. So great was Scheele's timidity that he had not the courage to present himself before the noted lecturer, though, with the zeal of a true chemist, he had set his heart upon the introduction. Circumstances, however, and the fame of some personal dexterity stood his friend; the student and the *savant* met, were mutually delighted with each other, and became sworn associates from that hour. A few months afterwards Scheele read a notice on Fluor Spar before the Academie des Sciences, and on the proposition of Bergmann, a simple student of Pharmacy, was elected an associate of the Academy. Such a distinction affected little the studious and retiring Scheele, who longed only for the quiet which would enable him in peace to pursue his studies. In vain Bergmann tried to keep so promising a man at Upsal by the temptation of a good position. In the name of the Government he offered him a Chair in the Faculty, and the direction of different manufactories. Scheele absolutely refused; but learning that there was a vacant pharmacy in a small and obscure country town, he set off for Kœping, on the Lake Malaren. He was then thirty-one years old, and while occupied in the routine duties of that seemingly unenviable position, he pondered over, and in his leisure moments successfully worked out, that series of discoveries that will forever be associated with his name. Two years from this date, (1777), the Royal College of Medicine received him gratuitously, and dispensed with all the usual formalities of introduction. Nine years he patiently worked on at Kœping. He found the business in a languishing condition, and he succeeded in its restoration; paid the debts of his defunct predecessor, as well as created a small fortune for the widow, whom, in his less abstract moments, he meant to marry. Bergmann was his unfailing herald in the world of Science. At his suggestion the Academies of Berlin, Erfurt, and Sardinia, and the Royal Society of Medicine at Paris admitted him amongst their ranks. Just when the present seemed to give promise of the brightest future, he was suddenly enfeebled in his health. He had wished, as a last point of honor, to have left his name and moderate savings to the widow, but the very day appointed for his marriage he was seized with fever, which proving fatal, he died at the early age of forty-three.

The first essay of Scheele was on Tartaric Acid. It was addressed to Bergmann, who returned it to the author without the slightest comment. Hurt by this strange indifference, Scheele sent his manuscript to Retzius, Professor at Lund, who inserted it in the *Transactions* of Stockholm for 1770, but with no acknowledgment of the author. In 1771 he published his "Examination of Fluor Spar and its Acid." Some years previous, Margraff was engaged on the same subject, and pointed out that Fluor Spar did not contain Sulphuric Acid. Scheele, on treating it with this powerful reagent, noticed certain white acid vapors which attacked the glass. He named this product Fluosilicic Acid. Remarking that the vessel filled with water in which it was collected was covered with a coating of Silica, he at first thought that Silica was composed of Water and Fluoric Acid; but in a second notice (1780) he recognized his mistake, and demonstrated that the Silica obtained came from the glass of the retort or else from the receiver. The ultimate result of this investigation was the admission of the radical called Fluor. In 1774 Scheele published his "Researches on Black Magnesia," otherwise called Manganese. He was then living at Upsal, for it was at the instigation of Bergmann that he undertook this inquiry—one of his best performances. This memoir contains no less than four discoveries, which would have sufficed to have established the reputation of a skilful chemist. In the first place, he discovered that this ore combined eagerly with metallic oxides and with some acids, whence he concluded that black Magnesia had a metallic base. On treating it successively with all the strong acids, he remarked (1) That with Sulphuric Acid he obtained a white pinkish salt (Sulphate of Manganese), and that there was liberated an elastic fluid which was not fixed air, the only gas then known, but which possessed the properties of *dephlogisticated* air, being evidently oxygen. (2) With Muriatic Acid he produced a gas of yellow color, having an odor of Aqua Regia. Having collected this gas in a bladder, it was colored yellow, from which he at first thought that it was Aqua Regia in a state of vapor. He then collected it in bottles filled with water, with Hale's apparatus, and he noticed that the gas corroded the corks and turned them yellow; that it bleached blue Litmus Paper as well as vegetable colors, and that during this action, in presence of water, the gas was converted into Muriatic Acid. He also established that plants once thus bleached did not recover their natural colors, neither on the addition of Acids or Alkalis; that this gas attacked all metals. In a word, he gave an exact and complete history of this new gas, which at first he called *Dephlogisticated Muriatic Acid*, which since has been termed *Oxygenated Muriatic Acid Gas*, and to which has been recently given the appellation of Chlorine.

A third discovery made by Scheele in studying Manganese was Baryta, with which it is nearly always associated. He showed that this new Earth, which he called *Terre pesante* (βαρὺς, heavy), is distinct from Lime and Silica; that it neutralizes acids, and forms with Sulphuric Acid and the Sulphates a neutral salt insoluble in water. Fused with Borax it forms a vitreous mass, which is colored brown on the addition of a little Sulphur, etc.

Lastly, he remarked that Ammonia, treated by Nitrate of Manganese, is decomposed, producing a gas differing from Carbonic Acid, namely, Nitrogen. Considering that this dissertation on Manganese was published in 1774, and that the experiments on which it is based went back for several years, Scheele may be regarded as having been the first to discover Nitrogen gas, which he for a long time called Vitiated or foul air (*Air vicié ou corrompu*).

Next year (1775) Scheele read before the Academy of Stockholm his *Remarks on the Salt of Benzoin.* Up to this time Flowers of Benzoin, already recognized as an acid, were obtained by means of sublimation. Scheele used the wet way, which gave a better and more abundant product. After boiling powdered Benzoin with quicklime, he filtered the solution and added Muriatic Acid. Benzoic Acid was precipitated in beautiful crystalline plates, of a strong odor when exposed to heat. This ingenious and convenient process has been followed ever since. [A most successful though unfortunately secret process was adopted by Mr. Fowler, of Bedford Street, Covent Garden. Since his death his method has apparently been lost. No Flowers of Benzoin with which I am acquainted are free from a certain empyreumatic odor, varying in different commercial samples, but always present.—J. I.]

The same year Scheele published one of his most important discoveries,—a paper on Arsenic Acid. He imagined that White Arsenic (*the Arsenious Acid* of Fourcroy) could take two degrees of acidity. He treated crude arsenic with Nitrous Acid, and obtained Arsenic Acid; he examined all its combinations with the alkalis and metals; he demonstrated that combustible bodies could bring it back to the state of White Arsenic, and even of Metallic Arsenic. On heating it in combination with Ammonia, he obtained a gas which extinguished flame, being neither fixed air nor Carbonic Acid. This was Nitrogen. Lavoisier and Berthollet repeated his experiments, and easily explained the various phenomena described by the principles of the new theory of Chemistry. Never weary of his labors, Scheele worked on Quartz, Silica, Clay, and Alum; then he commenced his Analysis of Benzoar, in which he discovered a particular acid, first called Lithic, and afterwards Uric Acid.

These researches paved the way for all the recent investigations of Urinary Calculi, and even of Urine itself.

The same year Scheele obtained Oxalic Acid by the action of Nitric Acid on Sugar. In 1777 appeared his treatise on Air and Fire, a work on which he had been long engaged. Whether or not he may claim to have been one of the original discoverers of Oxygen is uncertain, yet in this identical pamphlet occurs the capital experiment that when Manganese is exposed to a high degree of temperature and then heated with Sulphuric Acid, an elastic fluid is disengaged, which he named Air of Fire. Priestly had in truth announced the same fact in 1774, and Scheele, unfortunately for himself, only published his discovery when his work, which had been seven years in preparation, was complete. He established also the point that common air is composed of Air, of Fire and Foul Air (Nitrogen); that the process of combustion deprives common air of its purest part (Oxygen). The same work contains remarks of the greatest interest on Nitrous Gas, on Sulphuretted Hydrogen, on Fulminating Gold, and on the Radiation of Heat.

In the course of 1778 this wonderfully industrious man published four separate memoirs;—1. A process for preparing Calomel. 2. The preparation of the Oxychloride of Antimony. 3. The preparation of what is still called Scheele's Green, which was obtained on pouring a solution of Potash and white Arsenic in a solution of Sulphate of Copper. It is an Arsenite of Copper. 4. Molybdenum, whose ore was originally confounded with Plumbago; Scheele proved that it was a compound of Sulphur and a whitish powder (Molybdic Acid), from which more recently Hielm extracted Molybdenum in a state of Metal. In 1779 he continued the same subject, and showed in what manner Plumbago differed from Molybdic Acid, demonstrating that it was composed of fixed air and Carburet of Iron. This analysis was followed by *Experiments on the quantity of pure air contained in the atmosphere.* For a year he continued his observations and obtained the same results as Lavoisier, namely, that pure air (Oxygen) formed $\frac{9}{33}$d part of our atmosphere. About the same time appeared his "Experiments on the Decomposition of Neutral Salts by Quick Lime and Iron."

In the Annals of the Academy of Stockholm, are three published Memoirs belonging to 1780. A. Remarks on Fluor Spar, being chiefly an answer to objections to his previous paper. B. Examination of Milk and its Acid. After having stated the influence of Alkalis and Acids in determining its coagulation, he pointed out that caseine, when calcined, contained Phosphoric Acid and Lime. In order to obtain the Acid of Milk, he evaporated the Serum down to an eighth part, saturated it with quicklime, which he afterwards separated by Oxalic Acid; then he treated the Liquor with Alcohol, which dissolved the Lactic Acid without touching the Sugar of Milk. On distilling the Alcohol he obtained pure Lactic Acid. C. The examination of Sugar of Milk. On treating the concentrated Serum with Nitric Acid he obtained Saccho-lactic Acid in crystals, or in the form of a white powder, sparingly soluble in water, and forming, with alkalis, crystallizable salts. Each succeeding year is the record of some new and original observation; but we must not linger too long over details.

In 1781 appeared the Memoir on Tungsten and his discovery of Tungstic Acid. In 1782 three new memoirs saw the light, the first being *Observations on Ether*, and the second, *A Method for Preserving Vinegar*; the third, same date, is an *Essay on the Coloring Matter of Prussian Blue.* This is one of his most important dissertations, and probably his *chef d' œuvre.* It is divided into two parts. In the first, Scheele endeavors to discover the substance which, in Prussian Blue, is united with Iron and an alkali. The methods employed in this research are most ingenious, and show the utmost skill in the employment of reagents. By dint of repeated trial, he succeeded in discovering the coloring matter; his first description of it being that it possessed a peculiar odor, that of bitter almonds; that it had a burning taste, and produced coughing. It is strange that he did not at the same time remark its poisonous qualities. Possibly his very manipulations tended to shorten his life. In order to assure himself of its composition, he treated it successively with all the known alkalis and acids. When found he called it simply *The Coloring Matter.* Bergmann gave it the more ambitious title of *Acidum cœrulei Berolinensis,* afterwards styled Prussic Acid by Guyton de Morveau, and finally Hydrocyanic Acid by Gay Lussac. These experiments were subsequently followed up, Scheele continuing to study the action of this coloring matter on alkalis, acids, and metals.

He established that Prussiate of Ammonia might be entirely sublimed; that that of lime yielded its base to caustic alkalies and acids; that the coloring matter was capable of distillation. This product was used as a test for the presence of iron, and he then designated it as Precipant Liquor. In attempting the elementary analysis of Prussic Acid he at first supposed that it was formed of Ammonia and Oil. To convince himself of this, he tried every possible mixture of Ammonia and fatty bodies, but as no resulting product gave Prussian Blue with Sulphate of Iron, he was convinced that there was no oil in its composition. He put in a crucible carbon and potash, and kept them at a red-heat, then added Sal Ammoniac, and continued the heat until no more ammoniacal vapors were disengaged. He poured the whole into filtered water, and obtained a salt (Prussiate of Potash) which gave a dark-blue precipitate with Sulphate of Iron. By further experiments he came to the conclusion that this *coloring matter* was composed of Ammonia, Inflammable Air, and of a carbonaceous substance. These three bodies—Nitrogen, Hydrogen, and Carbon, are in fact the bases of Prussic Acid. The Annales de Chimie de Crell (1784) contain five memoirs, one being specially interesting to ourselves as Pharmaceutists—the discovery of a Sweet Principle obtained from Expressed Oils and Animal Fats. He obtained it by boiling one part of powdered Litharge in two parts of fat with a little water. This is the ordinary method for making Emplastrum Simplex. The supernatant liquor, separated by decantation, was evaporated to the consistence of a syrup. This substance, of a sweet taste, much like oil to the touch, was nevertheless not a fatty body, because it is soluble both in water and in Spirit of Wine. Exposed to a high temperature it burns, and is distilled at the same degree of heat as Sulphuric Acid. This product is not crystallizable, and does not undergo fermentation. It is needless to state that this was Glycerine, the name having been created for it by M. Chevreul. Since its discovery it has become most extensively applied in Pharmacy, though, like Chloroform, it remained for some time as a chemical curiosity.

The last research that we must notice was an attempt to obtain Citric Acid. Scheele had often been foiled in his endeavors to present it in a pure and crystallizable state. He imagined that the cause of his failure was the presence of a viscous matter in expressed lemon-juice which enveloped it. He tried at first to coagulate this matter by means of Spirit of Wine, but not being successful in obtaining crystals, he imagined that the Acid was masked by some foreign body, which he attempted to separate by mixing concentrated lemon-juice with Chalk. The filtered and washed precipitate was treated with Sulphuric Acid diluted with ten parts of water. The whole was boiled for some minutes, filtered, and concentrated; on cooling, a crop of beautiful crystals was obtained. Some of his last researches were on Acetic Ether, Benzoic Acid and on the Preparation of Prussiate of Potash. *Some* is the only fitting term, for his life was labor, and it is doubtful whether any one man ever crowded more into so short a life. Let it be remembered, to his honor, that he was simply a working Pharmaceutist, and that he passed nearly his whole life behind a druggist's counter. We must recollect, says M. Cap, that Scheele was not a professional Chemist, a *savant* whose sole mission was the advance of science, being able to give his whole time and abilities to that end. So far from it, the moments consecrated to study were never allowed to interfere with the routine of his occupation. In the midst of the dry and necessary duties of daily life, he had to ponder his experiments and to construct his simple apparatus. His fortune was too slender to let him wander into elaborate experiment, added to which, the character of his mind forbade any but the plainest and most direct methods of investigation. He seems to have thought intently, and then to have manipulated, for which reason the intermediate steps of his reasoning are seldom given in his writings. Nothing could be more bare and unpromising than his apparatus: a common furnace, a still, a sand-bath, a crucible, sundry phials, drinking-glasses, and bladders to receive his gases, constituted the whole wealth of his laboratory. With these simple elements he recognized acids, gases, metals, and elementary bodies, and worked at transcendental Chemistry in a back shop, with a few bottles and a retort.

Scheele, to his own great personal hindrance, had never received a single lesson or followed an academical course, and being also little familiar with any other language than his own—the German—he often was laboriously engaged in preliminary details which a knowledge of contemporary literature would have spared him, and he not unfrequently repeated experiments that had already been successfully attempted. He was thus forced to be profoundly original.

M. Dumas, no mean authority, declares:—"Whenever it is a question of facts, Scheele is infallible. Scheele rose to the highest rank he could attain by work, experience, and thought, without the aid of any scientific education. Whether he could have risen higher, I know not; still, when it is commonly said that in order to work for the advance of Science, it is necessary to live in the grand University centres and not in the atmosphere of provincial life, we cannot help turning our thoughts on Scheele and Kœping." Still, it must be allowed, that Pharmacy came somewhat to his aid. Had he not been a pharmaceutist his mind would not naturally have been led to the consideration of many subjects that came prominently under his notice. Thus, Cream of Tartar suggested his first essay on Tartaric Acid, and no sooner had he devised a method by which he could isolate this principle, than he applied it to the investigation of a great number of other acids and principles analogous. Once on the right track of analysis, he studied Benzoin, Gall-nut, Rhubarb, Orris, Asclepias, Turmeric, Ether, Milk, the fatty bodies, Salt of Sorrel, the Salts of Mercury, and many objects of Materia Medica, Indeed, he was led to his various discoveries by the exigencies of his daily life; his Pharmacy was the guide to his abstract Science.

The personal history of this great experimenter is almost whimsical in its simplicity, even when taking into consideration the plain and unostentatious living of the North. Scheele had but one passion—Science; for that he lived, and for that he had originally withdrawn himself from the stir and emoluments of city-life, that in its service he might die. It is almost impossible to match his marvellous devotion to one object, and the sincerity with which he despised wealth and honors. The King of Prussia in vain tried to have him at Berlin. The English Government offered him a post of distinction and £300 a year, both of which he refused. As we might expect, he was of a serious disposition, and spoke little. Never in a hurry, yet he was never idle, and he invariably pursued one study at a time.

In 1782 the President of Virly and M. d'Elluyart, a Spanish chemist, went on a pilgrimage to make the personal acquaintance of Bergmann and Scheele. After having seen Bergmann at Upsal, and from him obtained an introductory letter for Scheele, they went to Kœping, found the humble and learned apothecary in his shop, adorned with the traditional white apron (*revêtu du tablier traditionnel*), and busied with his ordinary work. Scheele received them most cordially, but kept at his business, and offered no excuse. He talked with them on the recent progress of Science, of his own researches, and of the discoveries of Bergmann. "He is the honor of Sweden," said Scheele to the two friends, who quite thought that he himself might share the compliment. The travellers invited him to dinner, but no sooner was it ended than he rose, went back to his laboratory, and let them follow at their leisure.

One last anecdote must not be omitted. The King of Sweden, Gustavus III., being on a tour in Italy, was present at a meeting of the Academy at Turin, of which Scheele had been elected a foreign member. Much was said of the important discoveries of the Swedish chemist, and some one asked the King (who piqued himself on knowing all the eminent men in his kingdom) how the illustrious Scheele was. "He is very well," replied the King, who, until that moment, had never heard his name. On his return to Sweden he hastened to gain information of this man, whose fame had penetrated Europe, and who was unknown in his own country. He learnt that the great chemist was a simple apothecary in the little town of Kœping. The King wished to ennoble him; the honor was refused; the order of knighthood was nevertheless transmitted; but being addressed to a namesake, Scheele remained with no other title than that of one of the greatest chemists of Sweden, and of his age.—*Lond. Pharm. Jour., Nov.*, 1863.

ON THE PREPARATION OF ACONITINE.

By MM. Liégeois and Hottot.

The process for preparing the valuable alkaloid aconitine, given by the authors above named, is, we believe, of English origin, and will, with a slight difference, be incorporated in the forthcoming British Pharmacopœia; we therefore extract it:—

"The bruised root of the *Aconitum napellus* is digested for eight days in alcohol slightly acidulated with sulphuric acid. The alcoholic solution is then pressed out, and the alcohol distilled off. A small quantity of green oil and an aqueous extract are thus obtained. The green oil is separated, and the extract further evaporated to the consistence of a syrup. It is now dissolved in water and neutralised with magnesia, and then shaken up with ether. The ethereal solution on evaporation yields the rough aconitine. This is again dissolved in water acidulated with sulphuric acid, and decolorised by means of animal charcoal. Ammonia is then added to precipitate the aconitine, and the mixture boiled, after which the alkaloid is collected on a filter and dried. This part of the process is repeated once, or twice if necessary, in order to obtain the alkaloid with as little color as possible. It is eventually precipitated with a very slight excess of ammonia, and dried at a low temperature."

Aconitine so obtained is of course completely soluble in ether, and possesses remarkable activity. The alkaloid received from the Continent, and commonly sold in England, is, as was recently shown by a correspondent of this Journal, of very inferior quality. Our correspondent administered three grains to a dog without producing the smallest discomfort to the animal. Two milligrammes, or little more than three hundredths of a grain, prepared by MM. Liégeois and Hottot by the above process, killed a frog in four minutes, while it required a grain and a-half of the most active they could find in commerce to produce the same effect.

What foreign aconitine is we have no means of knowing. It may be, as M. Barreswill supposes (*Répertoire de Chimie Appliquée*, September, 1863, p. 353), "some peculiar principle, such as asparagine, or perhaps, in some instances, for the most part, sulphate of lime." The latter was not the case with two samples we have examined, which possessed no more activity than that mentioned by our correspondent.

The British Pharmacopœia, we have been informed, makes considerable use of alkaloids, and as, in consequence of their greater cheapness, most of these will be imported from abroad, it will be incumbent on pharmaceutists to test their activity by experiments on living animals, or procure the alkaloids from reliable English sources.—*Chem. News, London*, Oct. 24, 1863, from *Journ. de Pharmacie*, August, 1863.

ON THE ESTIMATION OF CREAM OF TARTAR, TARTARIC ACID, AND POTASH CONTAINED IN WINE.

By MM. Berthelot & A. De Fleurieu.

1. In studying the acids contained in wines we have commenced with tartaric acid, being the most known among them. We first tried to find a process for estimating cream of tartar. After various attempts, we decided on the following process:—

Take ten cubic centimetres of wine, which introduce into a small flask, and add fifty cubic centimetres of a mixture of equal parts of alcohol and ether; shake and cork the flask, and leave it for twenty-four hours to the ordinary temperature. At the end of this time the cream of tartar will be precipitated, and will adhere to the sides of the vessels, while the acids, the water, and the rest of the matters contained in the wine remain in solution in the ethero-alcoholic mixture. This mixture retains besides about two milligrammes of cream of tartar, which must be taken into the account.

To effect the estimation, decant the liquid and throw it on a small filter; wash the precipitate, by decantation, in the same matrass with a little of the ethero-alcoholic mixture, which is thrown on the same filter. Place this filter on the matrass, break it, wash with water, put the filter in the matrass, heat it, and immediately afterwards determine the acid standard by means of normal baryta liquid.

We have arrived at this method by experiments made on an aqueous solution of cream of tartar, to which was added beforehand 10 per cent. of alcohol. Left for several days, we obtained a liquid similar to the majority of wines ; it contained three grammes of cream of tartar per litre. The baryta liquid was so adjusted that ten cubic centimetres of the above solution should require about fifty divisions of baryta. This process has been likewise verified for liquids containing either an excess of tartaric acid or small quantities of other organic acids. It is sufficiently correct, even in presence of a considerable proportion of foreign organic acids. Only in presence of a very large excess of these acids does this method fail. We will indicate further on, in treating of the estimation of potash, the means by which this exceptional excess can be ascertained.

II. By applying this process to the study of various wines, we found that—

1. In some wines the quantity of cream of tartar contained in solution was precisely the same as in the saturated solution of cream of tartar containing the same proportions of water and alcohol as the wine. This fact was ascertained especially with regard to the following wines, of which the total acid standard was about six times that of the cream of tartar ; Formichon, 1860 and 1862, (3 grammes per litre). This test is so much the more valuable, that these two wines contain no free tartaric acid, though they contain other free organic acids.

2. In most instances the proportion of cream of tartar is less than that of a saturated liquid. The difference amounts to one-half in the Formichon of 1860, in the Médoc of 1858, and ordinary Montpellier. The Savigny of 1859 and the Saint-Emilion of 1857 contain only about a-third of the cream of tartar necessary to saturate them. The smallest quantity was found in the Savigny wine of 1861, which had been frozen (less than a gramme per litre), and in Sautenay wine, 1858,

which had begun to change, and had undergone several changes (half a gramme per litre).

In no case was the proportion of cream of tartar greater than that corresponding to a saturated liquid.

Between the acidity of a wine and the amount of cream of tartar it contains there is no relation. In fact, in two wines of the same acid and alcoholic standards, such as Formichons of 1859—62, the cream of tartar varied from simple to double. The largest amount corresponds to a saturated solution of cream of tartar and to the newest wine. This fact is essential, for it shows that the variations do not seem due to a decomposing action exercised on the cream of tartar by the free acids contained in the wines examined.

We must add that Formichon of 1857, one portion bottled and another portion kept in a balloon—sealed, after inducing a vacuum, for the last three years—contained in each case exactly the same quantity of cream of tartar.

III. Supposing that the above method was applicable to the approximative estimation of the total amount of tartaric acid, and even of the whole quantity of potash contained in wines, we made the following experiments :—

1. Divide a weak solution of tartaric acid into two equal portions, neutralise one of the portions exactly by potash, and mix the two liquids. Add some of the ethero-alcoholic mixture before described, which will precipitate all the tartaric acid in the form of cream of tartar (except the trace of soluble cream of tartar in the mixture). Small quantities of organic acids may be added to the liquid without materially affecting the results.

2. According to these facts it suffices, to decide whether a wine contains free tartaric acid independently of cream of tartar, to take fifty cubic centimetres of the wine, to saturate ten cubic centimetres of it by potash, to add to them the forty others, to take one-fifth of the mixture and add to it fifty cubic centimetres of ethero-alcoholic mixture. If the wine contain free tartaric acid, a more abundant precipitate is produced than with the primitive liquid. The excess of acid in the precipitate corresponds nearly to half the weight of the free tartaric acid of the wine. The process has always been applicable to the wines we

have analysed, because their total acidity much exceeds that of the cream of tartar they contain. Now, the co-existence of neutral tartrate of potash and an organic acid is not admissible, for a solution of tartrate of potash, to which is added a trace of acetic or any other acid, then treated by the ethero-alcoholic mixture, gives a precipitate of cream of tartar.

We have, moreover, verified the exactness of the process by adding small quantities of tartaric acid to Formichon wine, and afterwards recovering it in the precipitate.

3. Applying this process to the examination of various wines, we found that most of them contain no free tartaric acid. We have ascertained this fact especially with regard to the follow-wines:—Formichon, 1860–61–62; Savigny, 1859–60–61, frozen; Savigny, 1862 (red and white Pinot); ordinary Montpellier; Mèdoc, 1858; Saint Emilion, 1857.

In a very few instances the addition of potash increases the precipitate, as with Formichon, 1858, and Brouilly, 1858 (free acid equal to half the acid contained in the cream of tartar), and with Formichon, 1859. In the latter wine the free tartaric acid was double that of the cream of tartar, and equal to 2·2 gr. per litre; the total tartaric acid, free and combined, =3·3 gr., the largest proportion of tartaric acid we have found in any wine. The smallest quantity was in frozen Savigny, 1861 (tartaric acid= 0·7gr. per litre), and in altered Sautenay, 1858 (0·4 gr.). In most instances the total weight of tartaric acid is given in that of the cream of tartar, of which it represents four-fifths.

The absence of free tartaric acid in most of the wines examined is a very important fact. Indeed, the acidity of the cream of tartar represents but a fraction of their total acidity. In the Formichon of 1858, for instance, the total acidity.* is equal to 7·4 gr. of tartaric acid per litre, while that of cream of tartar represents only 1·1 gr. of tartaric acid, and that of tartaric acid exceeds 0·5 gr.; there is then an acidity equivalent to 5·8 gr. resulting from other acids. Succinic acid makes at the most 1·5 gr., according to M. Pasteur's experiments, and acetic acid, a few decigrammes, according to those of M. Béchamp. There then remains an acidity equal to about 4

This acidity does not include carbonic acid, which we took care to eliminate, but which does not exist very abundantly in old wines.

grammes, representing fixed acids, little or not at all known (see M. Maumené's work, p. 104). To this amount must be further added the weight of acids combined with the bases contained in the wine. These facts indicate the need of further researches in the study of wines.—*Chem. News, London,* Oct. 10, 1863, from *Comptes-Rendus,* lvii., 394.

PRESERVATION OF GRAPES AND OTHER FRUITS.

By M. le Docteur Rauch.

Various means, more or less successful, have been suggested for preserving grapes,—a fruit most delicious and wholesome, but very difficult to keep.

One of the simplest ways is to dip the ends—the stalks of the bunches—in sealing-wax, and to suspend them from poles or cords in a cellar or cool room, where they will not be exposed to frost. By carefully removing any berries that may decay, grapes in this way may be preserved till the end of December. They generally preserve their freshness longer in a cellar than in a room, where the air is dryer; and this applies to nearly all other fruits. For this reason plums may be preserved for months in vessels filled with sand, hermetically sealed, and buried in the ground; exclusion of the air having the same effect in each case.

In the south of Russia there is another way of preserving grapes. They are gathered before they are quite ripe, put into large pots, and so filled with millet that each fruit is separate, and the pots are covered so as to render them air-tight. They are sent in this way to the markets of St. Petersburg. After remaining thus for a whole year, they are still very sweet, all their sugar being developed by the ripening process in the pots.

Recent experiments show that cotton possesses the useful property of preserving various substances. Meat-broth in a bottle, lightly closed with cotton, has been found to keep unaltered for more than a year. After this it was a natural course to try its preservative effect on various other substances, and in America cotton has long been successfully used for preserving grapes, in the following manner:—

The branches are left on the vine-stock as long as possible, even to the early frosts, provided they are but slight. The bunches are then cut with a sharp knife, all the damaged fruit removed with scissors, and then left for several days in a cool room. They are then put between layers of ordinary cotton, handling them very carefully, and placed in vessels such as tin boxes, or glass preserve pots, taking care not to put too many layers, so as to crush the lowermost. The receptacles are then covered and sealed. The latter precaution is certainly of use, though American farmers generally disregard it, and nevertheless have good grapes often as late as April. The fruit is kept in a cool place, but out of the reach of frosts.

Apples and pears are still more easily preserved in cotton, through it retards their ripening, which wool on the contrary, accelerates. American farmers therefore, a few days before they wish to eat the fruit, wrap it in wool, when it ought to take a beautiful golden color ; and pears ripened in this way are sold for almost double the price of those still a little unripe.

The most recent method was invented by a Frenchman, M. Charmeux, whose grapes, exhibited at several exhibitions, excited considerable attention. His method I have tried, and found it succeed very well. He attaches great importance to the maintenance of a certain degree of humidity. His directions are as follows :—

Leave the fruit on the vine as long as the season allows, cut off the bunches so as to leave a piece of the branch adhering to the stalk, comprising about two nodules above and three or four below. Carefully cement the upper end of the branch, and place the lower end in a phial filled with water, containing a little powdered charcoal, to prevent decomposition. Close the phial with wax, place the grapes in straw or cotton, in a cool room, but screened from frost. It might be better to hang them up, which could easily be done if the phials are well sealed. In this way, and by occasionally picking out any decayed grapes, I succeeded in preserving them from the autumn of 1859 to the beginning of April, 1860, and when I found the fruit excellent. They might, no doubt, be kept longer in a cellar, or in some place where the temperature is constantly at the same low degree, and darkness would probably be favorable to their preservation. —*Chem. News, London, Oct.* 31, 1863, *from Moniteur Scientifique*, v., 74.

ON THE DESTRUCTION OF NOXIOUS INSECTS BY MEANS OF THE PYRETHRUM.

By C. Willemot.

Of all substances hitherto proposed for the destruction of noxious insects, powders have been found the only ones that can be used to advantage, on account of their simple and easy method of application, All such powders, too, which have been employed, so far as known, are derived from the vegetable creation. It would occupy too great a space to enumerate here all the plants used in a form of powder for this purpose ; it will suffice to mention some which have been more particularly under observation. Among these are the straight-leaved pepperwort (*Lepidium ruderale*, Linn., and *Thlaspi ruderale*, Desfon.), found growing in uncultivated places and among rubbish around Paris. This is used in Southern Dalmatia, in the form of powder, almost exclusively for the destruction of fleas. In some parts of Southern Russia, especially in the Crimea, a plant very common in France, *Aristolochia Clematitis*, Linn. (common birthwort), is used exclusively to destroy bugs. Sawdust of aromatic wood, particularly American Cedar (*Cedrela odorata*, Linn.), is largely sold for the destruction of insects, and, according to some authorities, most of the powders sold in Paris for that purpose are composed of that substance. But after using and experimenting with them we have been fully convinced that the object cannot thus be perfectly attained. Their action is feeble, or they merely stupefy for a time the insect, which soon recovers its strength and sensibility to do injury.

The greater number of the plants which furnish the most satisfactory means for the destruction of insects are of the genus *Pyrethrum*. Many observers, considering the botanic resemblance (as well as similar properties of this genus) with kindred ones, as certain chamomiles, the *Anthemis Cotula* for instance, have pretended that such indigenous plants (chamomiles) may specifically furnish a powder for destroying insects equal in every respect to the *Pyrethrum*. But accurate and detailed experiments by ourselves and other competent observers refuse such assertion. All the efficacy of the *Anthemis Cotula* consists in rendering the insects insensible for a time, instead of destroying them. The inhabitants of the regions of Europe and Asia, near the Caucasian mountains, seem to have been the first to discover the properties of the *Pyrethrum*, and try on a large scale the powders obtained from these plants. The species employed differ according to the different localities.

It is easy to comprehend that the inhabitants of the Caucasus choose for their use that kind which is most abundant in their own country. Thus, in Armenia they prefer the red Pyrethrum (*P. roseum*, Biebers), commonly called "lowizachek," or flea plant.

The Persian powder, which appears most extensively used, is almost wholly composed of the flesh-colored Pyrethrum (*P. carneum*, Biebers.) Dr. Ch. Koch, in his "Travels in the East" gives very curious details respecting this precious species in the Caucasian regions. In the "Journal de la Société Impériale et Centrale d' Horticulture de la Seine," vol. iii., 1857, p. 756, also may be found an analysis of a note by Mr. Neumann, of Breslau, on the "Culture and Preparation of the Powder of the *Pyrethrum carneum*."

We may here remark, in passing, that in countries where the most frequent use has been made of these powders of *Pyrethrum*, they have only been applied to the destruction of those insects which are troublesome in dwellings. Our object has been to select from the different plants the one which presents the greatest range of efficacy; and we have been more exacting in this than heretofore has been the case in seeking a plant of incontestable efficacy for the destruction of insects, and which can be so applied, not only to vermin in the house, but also to those insects which every year commit such great ravages upon the cereals, fruit-trees, leguminous and ornamental plants, etc. A plant was desirable which can easily be acclimatized in France, the properties of which, in its wild state in its native regions, are neither destroyed nor weakened by cultivation, and which can be raised with but slight attention to its culture. We want, finally, a productive plant, to the end that the powder it furnishes may be sold at a very low price. Such a plant we are now fortunate enough to introduce for the public use. Its efficacy has been fully proved by a great number of persons, as will be seen hereafter; its acclimatization is very satisfactorily evinced: its culture is most simple; its properties are wholly retained; the production is very abundant; now nothing remains but its extensive propagation, which, however, is not without many difficulties. We will not disguise the fact that the great success so far attained by no means makes us suppose the task accomplished, but it nevertheless encourages us to continue our efforts with new perseverance. It was about 1850 when the first powder of Pyrethrum was introduced into France for the destruction of insects in houses. The powder came exclusively from provinces of the Caucasus, of Persia, and Dalmatia. Our researches have proved to us that that from the Caucasus is the best. For a number of years the inhabitants of those countries have successfully used the powder of the Pyrethrum to protect themselves against the ravages of numerous insects.

For a long period, a preparation was used throughout the Russian Caucasus for the destruction of injurious insects, and was regarded as a secret by the rest of the world, until its properties became known to Mr. Jumtikoff, an American merchant, while travelling through that country some forty years ago. He communicated his discovery to his son, who manufactured the article in 1828. This powder, or the plant from which it was obtained, was soon after introduced into Alexandropol, and subsequently the powder got into use in Germany and France, where its popularity is rapidly increasing. At present there are more than twenty villages in the district of Alexandropol engaged in cultivating the plant and collecting its flowers. The plants from which this powder is produced consist of small perennial shrubs, from twelve to fifteen inches in height, bearing flowers an inch and a half in diameter, and resembling those of the ox-eye daisy (*Chrysanthemum Leucanthemum*).

They grow on the mountains of the Caucasus, at an elevation of 5650 feet above the level of the sea, in a temperature of 68° Fahr. They are easy of cultivation in gardens, and since their hardiness has become known they have been introduced into Germany, Holland, and France, for the purposes of ornament, when they begin to flower in June. They will flourish in any ordinary garden soil, and may be propagated by layers as well as by seed.

The parts of the plants from which the powder is made are the dried flower-heads, gathered when ripe, on fine days, and usually dried by exposure to the sun; but they have been found to be more serviceable when dried in the shade, during which operation they are occasionally turned. In the process of desiccation they lose about 90 per cent. When perfectly dried, they are first comminuted with the hand, and then reduced to powder in a small mill.

A quantity of these plants grown upon eighteen square rods is estimated to furnish one hundred pounds of powder, which is best preserved in sealed vessels of glass. The application is made either as a powder or as an infusion, though in the latter form it is more beneficial, especially when intended for the destruction of insects on plants. The powder may be employed directly to the insects themselves, or in the places which they frequent. They are attracted by its smell, become stupefied, and immediately die. This substance may be employed without injury to the larger animals, or to man. It is intimated that the amount of this powder consumed annually in Russia alone is about 500 tons.

The inhabitants of the Caucasus and adjoining countries who used these powders had only a very limited knowledge of their plants, and did not suspect that one among them, the *Pyrethrum Willemoti*, Duchartre, would be called upon to render the most effective service to agriculture and horticulture, achieving the preservation of food, wool, furs, and the comfort of man and the domestic animals, etc.

These powders had been introduced into France for several years before a choice had been made among them, and the special importance of this particular species recognized. The high price, and the numerous adulterations they have undergone, diverted the public from this acquisition, and from a public appreciation of its efficacy. Submitted to a close analysis, these powders, as sold, have been found to be mixed with dangerous substances, which in due regard to public safety require to be vigorously excluded from sale. In them sumac powder is a common ingredient, from its close resemblance to the Pyrethrum powder; and also Jalap, cockle of Levant, nux vomica, and even arsenic, enter into the composition of the powders we have examined.

It was not till 1856, and after many efforts, that we could procure some good seeds of the Pyrethrum of the Caucasus. We were then able to extend our researches as to the culture of the plant. We had to proceed cautiously in determining the soil best adapted to it, to find out the best exposure, and to discover the care necessary to be bestowed on it. The first sown, on September 15, 1856, produced only a few shoots. A great point was to ascertain whether the plant was an annual or perennial. In order to determine this, several of the procured plants passed through the winter of 1856–57, and sustained from 8 to 12 degrees of cold without appearing to suffer.

The seeds gathered from this first culture were sown in February, 1858. In May, we communicated our experiments, and the success that had crowned them, to Messrs. Decaisne, Neumann, and Pepin. These gentlemen then examined the plant botanically, and their opinions are as follows:—(Here follows a botanical description of the genus *Pyrethrum*, and of the particular plant just referred to, from which it appears that the present species has not hitherto been described; hence M. Duchartre has named it *Pyrethrum Willemoti.*

Culture and Gathering.—The Pyrethrum, though a native of the Caucasus, where it grows abundantly and at a slight elevation above the level of the sea, under a latitude warmer than that of Paris, succeeds very well on good soil in France. It is very hardy, and can sustain without hazard the severe winter there. A few years' experience has taught the writer that it is little sensible to cold, and that it needs no shelter during the winter. It has been asserted that the kindred species which also grow in the Caucasus have rather suffered than benefited by the shelter given to them. The soil best adapted to the culture of the plant is a pure earth somewhat siliceous and dry. Moisture and the presence of dung is injurious, the plant being extremely sensitive to a mass of water, and would in such case immediately perish. A southern aspect is the most favorable. The best time for putting the seed in the ground is from March to April. It can be done even in the month of February if the weather will permit it. After the soil has been prepared and the seeds are sown, they are covered by a stratum of soil mixed with some vegetable mould, and the roller is slightly applied to it. Every five or six days the watering is to be renewed in order to facilitate the germination,

At the end of about thirty or forty days the young plants make their appearance, and as soon as they have gained strength enough they are transplanted. Three months after, they are transplanted again at wider distances, according to their strength, each time being of course watered, but only moderately.

The blossoming commences in the second year towards the end of May, and continues to the end of September. Within that period the heads from which the powder is made must be gathered. The most favorable time for gathering seems to be when the heads are about to open,—that is, when the florets of the circumference are yet standing erect. In this state the fecundation takes place, and the essential oil contained in the heads has reached its highest state of developement. The stalks and leaves, through having the properties in a less degree, may be used also for making powder, but they must be mixed with the flowers in the proportion of a third of their weight. The powder thus obtained will perfectly answer the destruction of insects. Toward the end of September, at which time the blossoming has ceased, the stalks are cut at about four inches from the ground. As the flowers are cut they are dried in a granary or shed, great care, however, being taken not to expose them to moisture or to the rays of the sun. When completely dried the flowers are to be hermetically closed up in sacks, so as to prevent too early pulverization. In pulverizing them it is better not to take a larger quantity than the wants of the moment may require. The volatilization, which is of course more rapid in the powdered form than in flowers, will thus be avoided. It has been suggested that the drying of the flowers for making the powder might be effected on sheet-iron plates, like tea-leaves are dried in China, but this operation is most injurious to the plant, dissipating the essential oil.

Pulverization.—Among the numerous methods which we have tried in order to simplify the pulverization of the dried flowers, that which appears the best is to pound the flowers in a mortar. The mortar should be covered with a piece of leather, through which the pestle moves, adjusting it in such a way as to prevent any contact from without, as is usually done in pulverizing drugs in a laboratory. The quantity to be pulverized should not exceed a pound at a time, thus avoiding too high a degree of heat, which would be injurious to the quality of the powder. The pulverization being deemed sufficient, the substance is sifted through a silk sieve, and the residue, with a new addition of flowers, is put into the mortar and pulverized again.

This method of preparation is so simple as to be within the reach of all; the pulverization by steam is more rapid and effectual, but necessarily more expensive. The best receptacles for holding the powder seem to be bottles; these, if well corked, will keep out moisture, which is so injurious to the properties of the powder. If the powder is not to be kept long, small boxes will do as well as bottles.

Insects destroyed by the Powder.—The principal insects to which the powder is destructive may be ranged under four classes:—first, insects injurious to agriculture and horticulture; second, insects obnoxious to man and his habitation; third, insects destructive to certain substances, as wool, furs, feathers; and, fourth, insects injurious to museums of animal and vegetable products, and collections of natural history. We do not pretend to enumerate all the insects to which the powder is destructive; it will suffice to mention a few instances, which will sufficiently show what applications may be made of it. Our domestic animals,—dogs, cats, fowls, pigeons, etc.,—are subject to annoyance from insects which cannot withstand the effects of this powder. Of the numerous insects injurious to agriculture and horticulture we may mention the following which have been destroyed by it:—the weevil, bark-beetle, wheat-fly, maggots, cocci, aphides, earwigs, spiders, ants, etc. It is evident that not only the perfectly developed insects are destroyed, but also the larvæ, which in some cases do greater injury than the insects themselves. Large depots where military stores or navy supplies are kept, and especially extensive bakeries, may use the powder with great advantage for the destruction of weevils, midges, crickets, cockroaches, etc., the great plague of those establishments. The powder is equally efficacious in destroying insects which are a constant source of annoyance to the inhabitants of cities and the country. Gnats and mosquitoes are banished;

bugs, fleas, and flies disappear from houses under its influence. As to manufactured articles, the powder is applied effectually to the following:—

1. Furs.—These require great care for their preservation. Numerous insects live upon them. Their propagation is rapid. The only remedy against their ravages hitherto has been pepper or camphor, but by using the powder of Pyrethrum the insects and their larvæ will be most effectually destroyed.

2. Feathers.—The same result will be arrived at by using this powder for the prevervation of the costly products of feather dealers. Most woollen products have also a number of insect enemies, especially in their undeveloped state, as larvæ. The powder of Pyrethrum, if applied in proper time, will effectually preserve all woollen articles. Natural history, too, has its share of the advantages afforded by this powder in the preservation of collections of mammalia, birds, fishes, reptiles, insects, and anatomical preparations.

Herbariums are very frequently devastated by insects gradually piercing the paper as well as the dried plants, reducing the latter almost to a powder, more especially if they have not been poisoned by chloride of mercury dissolved in alcohol—a substance both expensive and dangerous. By applying a pinch of the powder between the leaves of his herbarium, the botanist will soon get rid of the enemies of his collection. Finally, a most important advantage of this powder is that it is innocuous to man, and can be absorbed by the human subject without the slightest danger to his health. Some physicians of celebrity even assert that the powder can be advantageously sprinkled upon sores or open wounds that diffuse an unpleasant odor.

Mode of applying the Powder.—In using the powder it must be applied carefully and in sufficient quantity, otherwise the result will be unsatisfactory, especially if used against some of the hardy or very resisting species of insects. Occasionally the powder, by being exposed to the air or moisture, will have lost its destructive properties, so as to render the result doubtful and wholly inefficient; at others the result has been unsatisfactory, because the most favorable moment for the operation has been overlooked. A rainy or wet day, for instance, always lessens the destructive efficacy, because the powder, containing a very volatile essential oil, renders the conservation of this principle extremely difficult.

Of all the methods for applying the powder to plants attacked by insects, including the vine, the bellows will best accomplish the object. As there is only a small quantity of powder thrown at once, the loss will be very small, whilst in any other way a good deal of it will fall upon the ground. The powder should be directly applied to the parts operated on, and with care and precaution it may be made to penetrate into the most accessible part of a plant. If, for instance, a plant has been attacked by plant lice, which are often hidden or masked by thick foliage, it will become necessary to turn aside this foliage, so as to have the insects exposed, and the powder directly brought into contact with them.

In all cases these operations should take place on a warm day, the morning being always preferable. A slight moisture arising from the morning dew will make the powder more easily adhere to the spots where it is applied, and maintain its properties long enough to cause the death of the insects. The insufflation should be renewed several times, according to the nature and number of insects to be destroyed. The first operation generally stupifies them, while at the second or third application they lose their strength, fall to the ground, and die sooner or later.

In order to prevent the ravages of the wheat-midge, the powder is mixed with the grain to be sown, in the proportion of about two ounces to two or three bushels, which will save a year's crop.

For insects in dwellings the insufflation may be performed by bellows of a smaller size than those used in agriculture and horticulture. Proper care should be taken to make the powder penetrate to the recesses where the insects lodge. Household furniture ought to be scrupulously searched, and bedsteads and sofas sprinkled in the evening. By continuing this for several days, the premises will be thoroughly rid of insects.

For the preservation of furs, woollen garments, or patterns, it is necessary, at the approach of spring, to sprinkle the articles abundantly with the powder, the object in contemplation being, not the destruction of the insects, but the preventing their reappearance.—*Pharm. Jour. and Trans., Lond., Oct.,* 1863, from *the Technologist.*

PRACTICAL THOUGHTS ON LIGHT.

By James S. T. W. Smith.

Some time ago, while sitting at my desk, I observed that one of the show carboys in the window had focussed the sunlight on my coat-sleeve, and was burning it. It is quite possible that many fires may have taken place in this way when no satisfactory reason could be given for their occurrence. It would be well in arranging goods and show-glasses in druggists' shops, to bear in mind this fact, and to so place goods (especially any which would readily take fire) that focussed rays of light would never fall on them.

The circumstance caused me to reflect upon the general influence which light exerts upon pharmaceutical preparations stored in shops; and knowing the prejudicial effects of light upon chemicals, it is very natural to ask if it cannot to a great extent be prevented from doing so much injury.

In order that the subject may be made as plain as possible, it may not be amiss to give a general idea of the *nature* of light, and *how* it acts. To be as brief as possible, it may be remarked that a ray of light has been found to have three distinct properties at the least; namely, the property of giving *heat* and *light*, and the power of producing *chemical action*.

Men of science have demonstrated this for us by passing a ray of light through a prism, and then examining the spectrum produced. The spectrum, as first produced by Newton, appeared to him to consist of *seven* primitive colors; but since his time others have represented that there are only *three*, and that the seven are produced by the mixing of the edges of the colored bands in the spectrum. Thus assuming blue, red, and yellow to be the primitive or fundamental colors, the other colors of the spectrum are represented to be produced by the meeting and overlapping of the bands, blue and yellow, for instance, producing green. It has been found that the red ray contains the most heat, the yellow ray the most light, and the blue, or violet ray, exercises the greatest amount of chemical action. But while the heating effect of the ray of light extends beyond the visible part of the spectrum at its red extremity, so also the chemical effect, or *actinism* as it is called, extends beyond the visible part of the spectrum at the other or violet end. It has therefore been assumed that the heating and chemical effects are due to vibrations which, although they accompany those of light, are nevertheless distinct from them. For our present purpose, however, we may consider that the heating, luminous, and chemical effects of light are associated with the colored rays mentioned, and that the heating and actinic rays are those that do the greatest amount of damage to goods. Yellow glass completely prevents actinic action, and white opaque glass is the best adapted for keeping anything cool. It appears to be quite a mistake to keep wines and syrups in *dark* colored bottles, for dark colors absorb heat most readily; and opaque white glass would be cooler, on account of its reflecting the heat from its surface instead of absorbing it. It is quite evident that if the plate-glass in our shop windows was tinted with pale yellow, many things might be placed in the window without the risk of suffering so much damage as they many times do; and if all our bottles were tinted yellow, many chemicals would keep longer in good condition. It would be interesting to know the exact effects produced upon different substances by keeping them in bottles of various colors.* In some cases, such as in the preservation of salts of silver, the iodides, etc., yellow glass would appear to be the best, on account of its preventing chemical action. There might be instances where chemical action was not so intense in its effects; but where the *heating* rays of light do most harm by elevating the temperature and giving encouragement to fermentation, as in the case of syrups, or in causing too much evaporation, as with ethers, in the first instance yellow glass bottles would be the best antidote, and in the second, white opaque glass would be the best, because the

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* Some interesting and important information on the effects produced on vegetable colors by the different colored rays of light will be found in a paper by Sir J. Herschel, in the Philosophical Transactions for 1842. It appears that the vegetable colors are affected by the luminous rays rather than the chemical ray, and that the rays most effective in destroying a particular color are those which are complementary to it. Thus, vegetable blues are most affected by the red orange and yellow rays, purple and pinks by the yellow and green rays, and orange yellows by the blue rays. —ED. PHARM. JOURN.

coolest. When we wish to bleach oils in our windows, it would be well for us always to be particular what tint the glass bottle has into which we place the oil. *Colorless* glass, of course, would be the best. It is possible that light affects the brilliancy of our tinctures as much as the air. Take tincture of myrrh for example : when it becomes muddy, the remedy suggested is to make up (with more spirit) the deficiency lost in evaporation; but the addition of the spirit does not dissolve the deposit, nor yet brighten the tincture. The insoluble sediment is said to be *oxidized:* now this is questionable, for gums in the preparation of varnishes are said to be much more *easily* dissolved by being freely exposed in a powdered state to the action of the air, or, in other words, *oxidized.* May the light (in this case and many others) not be the cause of chemical action?

The use of yellow bottles on our shelves might change the appearance of shops; it would compel the use of a different kind of label, as the gold label would not contrast well with yellow bottles. Chevreul's principles would lead us to choose a label of a violet hue, or a color complementary to yellow, so that the harmony of colors might be preserved.

The objection to the use of the yellow glass in the *window* would be that it might interfere with the health of assistants by checking that portion of the light which is so essential to life. I remember having seen somewhere an account of some factory inspector who objected to yellow coloring in houses, as he always found the people most unhealthy in them. The subject may possibly be worthy the attention of those versed in such matters.—*Lond. Pharm. Journ., Nov.,* 1863.

Hexham, October 15, 1863.

POISONOUS PROPERTIES OF THALLIUM.

M. Lamy, through M. Dumas, tells the Academy of Sciences that thallium—one of the new bodies discovered through spectral analysis—has poisonous properties. A very small quantity suffices for the destruction of dogs, rabbits, and fowls. The chief symptoms are intestinal pains, tremblings, paralysis of lower extremities, and death. M. Lamy was led to consider thallium a poison, in consequence of having experienced, during his preparation of it, symptoms which were new to him, and amongst them, a remarkable feeling of weariness. Its presence in the body is readily shown. A portion of any part of the body poisoned by it, not bigger than a pea, is enough for the analyst. Its presence will be instantly disclosed by spectral analysis. We shall hear more of this, no doubt; for M. Lamy has presented M. Bernard with a quantity of thallium for experiment—the society for the protection of animals notwithstanding. We need hardly add, that thallium will be rapidly introduced into the practice of medicine. We shall now every day expect the announcement from some *confrère* of the wonderful "effects of thallium" in epilepsy or some other like incurable disease, with, of course, a list of cases distinctly illustrative of the statements and belief of the author.—*Med. News and Library*, *Dec.*, 1863, from *Brit. Med. Jour.*, Sept. 12, 1863.

RESULTS OF AN EXAMINATION OF THE PROCESS FOR MANUFACTURING PRUSSIATE OF POTASH.

By the late Mr. John Lee, and Dr. Richardson.

These experiments were made as far back as 1847, but the notes had been overlooked, and were only found when it became necessary to prepare an account of the manufacture of this salt for the new edition of the Chemical Technology.

The experiments were made in gun-barrels, and the same mixture of materials was employed in each case. Clean horn, carefully rasped, was mixed with the best potashes and iron filings. A small quantity of water was added, to assist in making an intimate mixture, which was carefully dried and reduced to a fine powder. This mixture was composed of,—

Horn,	16·00
Potashes,	17·72
Iron,	3·00
Moisture,	3·28
	40·00

A potash-charcoal was made by soaking 13 parts of wood-charcoal with a solution of 4 parts of potashes, and then perfectly dried.

A gun-barrel was partially filled with the mixture, and exposed to a red heat in a separate furnace. In the first and second series of experiments, the gases generated in the gun-barrel were passed through the potash-charcoal which was maintained at a red heat in an iron tube placed in another furnace. In the third series of experiments, the gases were passed through hydrochloric acid, and in the last experiments, the gases escaping from the iron tube containing the potash-charcoal, were conveyed through hydrochloric acid and then through a solution of potash. In the last series, the gases which escaped, were collected and analysed.

In each case, the prussiate was extracted and crystallised. The ammonia was determined in the usual way, but in the tabulated results which followed, the ammonia is given in its equivalent of crystallised prussiate of potash.

The theoretical yield of prussiate was 382·50, and the actual quantities obtained, were as follows :—

	I.	II.	III.	IV.
Retort .	101·97	135·46	146·93	141·08
Tube .	68·26	63·54	—	71·00
Acid .	—	—	140·24	58·80
Potash .	—	—	—	2·75
Total .	170·22	199·00	287·17	273·63
Loss .	212·28	183·50	95·33	108·87
Produce per cent.	44·5	52·2	75·1	71·5

The gases were not collected until the air had been expelled from the apparatus, and consisted of—

Hydrogen	46·00
Carburetted Hydrogen . . .	14·66
Carbonic Oxide	25·34
Nitrogen	14·00
	100·00

It would therefore appear that part of the nitrogen of the animal matters is eliminated in its ultimate form, and cannot be made available in this manufacture. It would also appear that a modification of the apparatus used by manufacturers would probably be followed by a much larger produce than is at present obtained.—*Chem. News, Lond., Oct.*10, 1863.

NOTE ON CASSIA MOSCHATA, H. B. K.

By Daniel Hanbury, Esq., F. L. S.*

Read June 18th, 1863.

The genus *Cassia,* as constituted by Linnæus, furnishes to medicine, as is well known, two drugs of some importance, namely *Senna leaves* and the pods called *Cassia fistula,* in connexion with the second of which I beg leave to submit to the Linnean Society the following observations.

Although the name *Cassia fistula,* which is the common commercial designation of the drug, is properly applied to the ripe legumes of *Cassia Fistula,* L., only, it sometimes designates those of *C. brasiliana,* Lam., and, as I shall presently show, those also of a third species of *Cassia.* The legumes of the first-named, which, on account of the laxative saccharine pulp contained between their transverse septa, find a place in many of the pharmacopœias of Europe, are familiar to most botanists; they are straight or slightly curved, cylindrical, smooth, indehiscent woody legumes, 1½ to 2 feet long by ¾ to 1 inch in diameter, and of a deep chocolate color. The legumes of *C. brasiliana,* which are seen in commerce but rarely, differ from those of *C. fistula* in being compressed and thicker, and in having two prominent ridges marking their ventral suture and one similar ridge their dorsal; from each suture ramify prominent nerves, giving a rough surface to the legume, which is increased by a cracking and exfoliation of the epidermis. The third form of the drug was distinguished several years ago by Professor Guibourt,of Paris, who described it under the name of *Petite Casse de l'Amérique,* observing that it differs from ordinary *Cassia fistula* in being of smaller size, in containing a pulp of pale color and austere, astringent, yet saccharine taste, in the seeds being separated by thinner septa, and in the extremities of the legumes being apiculate instead of rounded. M. Guibourt regarded these pods as derived from a variety of

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* [Communicated by the author.—Ed. Am. Jour. Pharm.].

Cassia fistula, L., or possibly from a different species. My friend Mr. Morson has also observed some *Cassia*-pods of unusually small size imported into the London market from New Granada, and which were apparently identical with M. Guibourt's drug. In some of them, which he was kind enough to give me, I could detect no differences which appeared sufficient to distinguish them from the legumes of *Cassia Fistula*, L., to which plant I referred them, attributing their slight variation to want of culture or a poor soil. A few months ago, however, Mr. Sutton Hayes, of Panama, (to whose kindness I am indebted for many interesting communications), sent me several pods marked *Cañafistola de purgar*, which I recognized as the small variety of *Cassia* of Messrs. Guibourt and Morson. In reply to my remark that they were derived from *Cassia Fistulà*, L., Mr. Hayes observed, "I think you are wrong as to the tree which produces the pods I sent you being a form of the true *C. Fistula.* I have often seen both trees; and the true *C. Fistula* is much less like the *Cañafistola de purgar* than many other species of *Cassia.* The flowers of *C. Fistula*, L., are of light yellow and in very long racemes, and the leaflets are different in shape and much larger. The flowers of the *Cañafistola de purgar* are yellow, becoming brick-red with age; the racemes are much shorter than those of *Cassia Fistula;* and the leaflets are altogether different, being much smaller and quite like those of *C. brasiliana;* in fact, the *Cañafistola de purgar* is much nearer *C. brasiliana* than it is to *C. Fistula.* The wood of the tree is very dark-colored, heavy, and compact, and is considered one of the best on the Isthmus: it makes excellent fuel. The tree is very common in open woods on hills, and is perfectly indigenous; whereas *C. Fistula* is to be found only about towns and in old cleared places, as if introduced. I have never seen *C. Fistula* in the virgin forests. *C. brasiliana* is very common about Panama."

Upon examining Mr. Hayes's plant and comparing it with the species of *Cassia* already described, I have found it to agree with the *Cassia moschata* of Humboldt, Bonpland, and Kunth, so far as the characters of that plant have been recorded; and M. Triana, who is now engaged on the Flora of New Granada, and has compared Mr. Hayes' specimens with the type specimens in Paris, has arrived at the same conclusion. As the notices of this plant hitherto published are quoted entirely from the 'Nova Genera et Species,' the authors of which had not seen the flowers, I have thought it desirable to draw up a complete description, which, with a drawing, I have now the honor of laying before the Society.

CASSIA. Sect. *Fistula*, DC. Subsect. *Ebracteatæ*.

C. MOSCHATA (H., B., K., Nova Genera et Species, vi. 338); arborea; foliolis multijugis, oblongis, apice rotundatis, utrinquepubescentibus deinde supra glabrescentibus, antheris glabris, leguminibus cylindricis.

DC. Prod. ii. 489; Vogel, Synopsis Generis Cassiæ, 11; Walp. Rep. i. 812; *Cathartocarpus moschatus*, Don, Syst. of Gard. and Bot. ii. 453.

Hab. Ad isthmum Panama, ubi ab incolis *Cañafistola de purgar* vocatur (*Sutton Hayes*, No. 58); ad fluvium Magdalena (*Humboldt et Bonpland*, *Triana*); ad ripam fluminis Casiquiare paulo infra ostium superius, arbor unicus ab Orinoco, ubi abundare dicitur, allatus (*Spruce*, No. 3300); ad pagum Villavicencio prope Bogota (*Trianá*, No. 4376).

Arbor 30–40-pedalis, ramulis novellis flavescenti-pubescentibus. *Folia* alterna, abrupte pinnata, petiolo communi 4–10 poll. longo, pubescente, supra pubescentia ampliore flavescente. *Foliola* 10–18-juga, subopposita vel alterna, oblonga, inæquilatera, basi utrinque rotundata, apice obtusa, interdum mucronulata, reticulato-venosa, 1½–2 poll. longa, 6–7 lineas lata, margine integerrimo, pubescente, nervo medio subtus prominente, pubescente, pagina foliolorum superiore nitida parce et breviter pilosa vel glabrescente, inferiore fuscescenti-pilosa vel puberula. *Stipulæ* triangulares, caducæ. *Racemi* laterales, 6–10-pollicares, simplices, graciles, puberuli. *Flores* flavi, mox rubescentes. *Pedicelli* ad 5 lineas longi, gracillimi, minute pubescentes. *Calyx* quinquesepalus, puberulus vel glabrescens, sepalis rotundatis, obtusis, concavis, reflexis. *Petala* quinque, concava, reticulato-venosa, flava, glabra, subæqualia, semipollicaria; superius ovale, longe unguiculatum, altera suborbiculata, breviter unguiculata. *Stamina* decem, inæqualia, glabra; quatuor inter se æqualia, corolla parum breviora; tria his triplo vel quadruplo longiora, curvata, basi geniculata; tria brevissima, quorum lateralia incurva, medium filamento crasso, dilatato. *Antheræ* staminum quatuor breviorum ellipticæ, bilobæ, basi et apice biporosæ, dorso medium versus affixæ; antheræ staminum trium longiorum late ellipticæ, birimosæ, introrsum dehiscentes, basi affixæ; antheræ staminum trium brevissimorum birimosæ, tribus supradescriptis haud dissimiles sed valde minores. *Ovarium* longe stipitatum, lineare, adscendens, falciforme, margine superiore basin versus parce pilosum, aliter glabrum. *Stigma* oblique truncatum. *Legumen* cylindricum, rectum, 1–1½-pedale, lignosum, durum, læve, corticatum, breviter apiculatum vel obtusum, septis transversis numerosis ut in *Cassiæ Fistulæ*, L. legumine (cui simillimum) instructum. *Semina* ovato-rotundata, compressa, nitida, durissima, 3 lineas longa, coloris cinnamomei, in succo saccharino adstringente immersa.

Cassia moschata, as remarked by the authors of the 'Nova Genera et Species,' as well as by Mr. Sutton Hayes, is nearly allied to *C. brasiliana*, Lam., but it is easily distinguished from that plant by its comparatively glabrous yellow flowers and its totally different legumes. These legumes are stated by both Mr. Hayes and M. Triana to be used in medicine in New Granada instead of those of *C. Fistula*, L.; so that their occasional appearance in European commerce is not surprising. They differ from the latter by their smaller size, less regularly straight and cylindrical form, and especially by their paler and less saccharine pulp, which, when fresh, is stated to have a slightly musky odor. These characters are of but little value botanically; the leaves, however, of *C. moschata*, its shorter racemes and nearly glabrous ovary, amply suffice to distinguish it from *C. Fistula*, L.—*Trans. Linnæus Society, vol. xxiv.*

DETECTION OF NITRIC ACID IN POTABLE WATER BY MEANS OF BRUCINE.

By R. Kersting.[*]

The author makes a solution of one part of brucine in 1000 parts of water. He pours a cubic centimetre of this solution into a glass, and adds a cubic centimetre of the water under examination for nitric acid; he then pours very slowly down the side of the glass a cubic centimetre of sulphuric acid, so that the acid may form a layer at the bottom of the glass. Then, if nitrates are present in water, a zone of rose-color appears on

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[*] *Annalen der Chem. und Pharm.*, bd., cxxv., s., 254.

the surface of the acid. The zone turns yellow on its lower surface, but remains without further change for some hours. By carefully shaking, the glass the rose color may be made to reappear above the yellow zone.

A cubic centimetre of water containing $\frac{1}{10000}$th of nitric acid shows the reaction very decidedly, but it may be seen when the amount of acid is ten times less.

As the sulphuric acid, the brucine, and water employed to dissolve it may contain nitric acid, this source of fallacy must be guarded against, and the author recommends that the water should be distilled from potash, the sulphuric acid distilled with about 5 per cent. of carbonate of ammonia collecting only three-fourths of the acid, and the brucine well washed with distilled water.—*Chem. News, London, Oct.* 17, 1863.

ON THE PRODUCTION OF CRYSTALLINE LIMESTONE BY HEAT.

In this *Journal*, vol xxxii. p. 112, an abstract is given of Rose's experiments on the deportment of carbonate of lime at a high temperature. Among other interesting conclusions drawn by Rose, he says that "chalk or compact limestone cannot be converted into crystalline limestone (or calc-spar) by exposure to a high temperature in closed vessels, and as a general fact, that rhombohedral carbonate of lime is not formed in the dry way." Further, "that the so-called crystalline marble, obtained by Sir James Hall in his experiments, was probably nothing more than a slightly coherent but otherwise unaltered mass, which Hall erroneously considered to be crystalline marble."

Rose states, in a recent communication to the Berlin Academy of Sciences, that he was not entirely satisfied with his former results, especially as Dr. Horner, President of the Geological Society of London, assured him that he had inspected the specimen of marble made by Sir James Hall, and that it differed entirely from the amorphous product obtained in the Berlin experiments. Rose, therefore, repeated his investigations on the subject, and has now obtained results which differ entirely from those he formerly published, and which fully confirm the correctness of Sir James Hall's conclusion, that marble can be produced by exposing massive carbonate of lime to a high temperature under great pressure. The experiments were made with aragonite from Bilin, in Bohemia, and with lithographic limestone. In one case, the mineral was heated in a wrought-iron cylinder, and in the other, in a porcelain bottle, special precautions being taken to exclude the air, and make the vessels as near air-tight as possible. These were exposed to a white heat for half an hour, and, on cooling, both the aragonite and the lithographic limestone were found to be converted into crystalline limestone, the former very much resembling Carrara marble, and the latter a grayish-white granular limestone. The change took place without any material decomposition, the resulting marble containing a trifle less carbonic acid than the lithographic limestone from which it was produced.—*Amer. Jour. Sci. and Arts, Sept.* 1863, from *Pogg. Ann.*, cxviii. 565. G. J. B.

ON PHLORIDZINE AND ITS USES.

By Dr. De. Ricci.

Phloridzine is a neutral principle existing in considerable quantities in the bark of the root of the apple, plum, and cherry trees, but principally in the root of the apple tree. It appears in the market in the form of a dirty-whitish powder, consisting of broken-up, silky needles, somewhat resembling quinine which has not been well bleached, and when rubbed between the fingers it has a soft, velvety feel, very like that of French chalk. When crystallized by slow cooling from a dilute solution, previously treated with freshly prepared animal charcoal, phloridzine may be obtained perfectly white, and in the form of long silk needles. Its taste is peculiar, being bitter at first, but afterwards somewhat sweetish, with a flavor of apples. Phloridzine differs from quinine by containing no nitrogen in its chemical composition, but in this respect it resembles salicine, to which it is much allied. Like salicine, it does not combine with acids, to form salts, is very soluble in alcohol, ether, or boiling water, but requires one thousand parts of cold water for solution.

The cases in which Dr. De Ricci has employed phloridzine with most success have been certain forms of atonic dyspepsia occurring in delicate females, to whom it was impossible to administer either bark, quinine, or salicine in any shape, without bringing on serious nervous excitement. He has also found it extremely well adapted for the treatment of young children of delicate constitutional habit, or when recovering from whooping-cough, infantine fever, or any other disease. The doses he has employed are five grains three or four times a day for adults, and proportionately smaller doses for young children. In prescribing phloridzine it must be borne in mind that it is almost insoluble in cold water, but the addition of a very small quantity of ammonia instantly dissolves it; thus, by adding to an eight ounce mixture, containing a drachm of phloridzine, a few drachms of aromatic spirit of ammonia, the fluid which was previously milky becomes perfectly clear, and the addition of the aromatic spirit rather improves the mixture than otherwise. Dr. De Ricci relates the case of a young lady of a strumous constitution, suffering from chlorosis, in which the effects of phloridzine were manifestly favorable. The patient was unable to take iron in any shape, and both quinine and salicine equally disagreed with her ; but phloridzine agreed perfectly well, and her constitution improved so much under its use that she was subsequently able to take citrate of iron and strychnia in grain doses which ultimately effected a perfect cure. Dr. De Ricci thus recapitulates the advantages of this drug; it is tolerated in cases where neither quinine, nor salicine, nor bark, can be administered with impunity; it is particularly adapted to young children, it is not expensive, and it is abundantly supplied in Great Britain, thus rendering us independent of the rapidly diminishing cinchona forests of South America.—*Dublin Quar. Jour. of Medical Science. August*, 1863.

PICONITRATE OF POTASH AS A VERMIFUGE.

Some months ago Dr. Friedrich, of Heidelberg, described, in Virchow's *Archiv*, the beneficial effects of piconitrate of potash in cases of trichnia. The remedy has also been employed in tænia. Dr. Walter, of Offenbach, relates the case of a woman aged 30, who had *tœnia solium* for several years. During fifteen months he had employed all known remedies for tapeworm, including the bark of the root of the pomegranate, considered by some as infallible. On November 15, 1862, he gave the patient five pills, each containing five *centigrammes* of piconitrate of potash.* On the 20th, an entire worm was expelled with the head. Four days after taking the medicine, the patient presented a jaundiced appearance.—*Dublin Med. Press,* May 27, 1863, from *Archiv fur Pathol. Anat. und Phys.*

ON THE COLORING PRINCIPLE OF VOLATILE OILS AND A NEW BODY, AZULENE.

By Septimus Piesse, F. C. S.

It is generally known that essential oils or ottoes of plants have peculiar and characteristic colors, they are either yellow, blue, green, brown, or white, *i. e.* colorless.

Having made some progress towards the discovery of the nature of the matters which impart these several colors, I now record the facts ascertained.

The principal interest rests with the blue substance which gives color to the otto of chamomile, because the same body is present in other volatile oils, and imparts to them a green color, being at the time under disguise by a yellow resin, which is also present in volatile oils of a green tint.

When blue otto of chamomile is subjected to fractional distillation, the white hydrocarbon anthemidine is easily separated from the blue coloring, because the latter requires a much higher temperature to vaporize it than the former.

By the fractional distillation of otto of wormwood, Absinthii, I obtain first a nearly colorless hydrocarbon, then at the third fractioning an oil having a brilliant green color, which at the fifth fractioning divides into a blue oil and a residuary yellow resin.

When otto of Patchouly, obtained by distilling with water the Indian herb *Pogostemon Patchouly,* is subjected to fractional distillation, I obtain in like manner, first a colorless hydrocarbon, then, but not till the eleventh fractioning, a beautiful blue oil and a brown-yellow residue; the great number of fractionings required to separate the blue oil in this case is caused by the closer boiling-points between the patchouly hydrocarbon, the blue oil, and the resin, all of which are exceedingly high. The

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[This is also known as picrate, nitropicrate and carbazotate of potassa. The acid is made from coal tar creosote, from Australian gum, and from oil of wine wintergreen. A short notice of it will be found in the appendix of the U. S. Disp. 11th Edition.—Ed. Am. J. Ph.]

otto of bergamot from the rind of the fruit, *Citrus bergamia*, as also otto of Ceylon Lemon-grass, *Andropogon Schœnanthus*, yield by the same treatment small portions of this blue coloring. By repeated rectification of the blue fluid, from whatever source derived, I at length render it free from extraneous matter and in a state of purity, it then has a fixed boiling-point of 576° F., its sp. gr. 0·910; when boiled, it produces a dense vapor of a blue color, having special optical* characters. I have named this substance Azulene, from azure—blue. The analysis of Azulene shows its formula to be:—

C 16	.	.	82·05	.	. 81·21
H 13	.	.	11·12	.	. 10·95
O	.	.	6·83	.	. 7·84
			100·00		100·00

Or, $C_{16}H_{12}+HO$.

The yellow coloring-matter which imparts its tint to the several ottoes, appears to be an oxidised portion of the otto so stained. In nearly all instances, ottoes which are colorless when first obtained from their source become yellow by age, *i. e.*, oxidation. This, however, is not universal, as the otto of nutmeg remains colorless for a lengthened period, even when air is drawn through it by an aspirator.

The oxidised portion of the yellow-colored oils, when separated from the pure otto in which it is dissolved, are true resins; the majority of ottoes oxidize during the act of distillation, hence from this cause they vary in color from pale-yellow to red-brown. When new, that is, freshly distilled, several essen-

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* Sir David Brewster has optically examined two blue ottoes which owe their color to the presence of azulene, namely *Matricaria Chamomilla* and *Achillea Millefolium*. "Without entering," says Sir David, "into details respecting the general action of these oils upon the different colored portions of the spectrum, I shall confine myself to a slight notice of their specific action in which they differ from all the various bodies which I have yet examined.

"Between the two lines A and B, of Fraunhofer's map of the spectrum, there are two groups of lines shown in that map. The two oils absorb the light in these portions more powerfully than in the portions adjacent to them. No other fluid or solid on which I have made experiments acts in a similar manner; but what is very remarkable, the earth's atmosphere exercises a similar action when the sunlight passes through its greatest thickness at sunrise and sunset."

tial oils are of a pale-green, but indicating the presence of azulene; but as oxidation proceeds, the yellow resin generated conceals the azulene. We have—

A. Ottoes which are colorless, containing neither azulene nor resin.

B. Ottoes which are yellow, containing resin only.

C. Ottoes which are blue, containing azulene only.

D. Ottoes which are brown-green and yellow-green, containing azulene and resin together, in proportions varying as optically indicated.

It is remarkable how little azulene gives color to an oil that contains no yellow resin: the otto of chamomile is familiarized to us by its blue color, but it does not contain one per cent. of azulene; Patchouly otto, which yields six per cent., and wormwood otto, which gives three per cent. of azulene, do not appear at all blue, owing to the presence of an excessive quantity of yellow resin.

At the third fractioning of wormwood, the yellow resin and the azulene are in due proportions to form a green solution, and such is probably the case with other ottoes known for their green color, such as Caguput, but which I have not yet examined.

Of the chemistry of azulene, and the part it plays in connection with odorous bodies, I hope soon to eliminate some fresh facts and to place them before the reader.—*London Pharm. Jour., Dec.,* 1863.

NEW FEATURES IN THE SUPPLY OF PERUVIAN BARK.

By John Eliot Howard, F. L. S.

A considerable quantity of medicinal bark has recently been introduced into the London market, coming by way of Pará, on the Amazon. It consists of flat and quill bark packed in serons, and imitating to a considerable extent the *primá facie* appearance of Calisaya bark. It is probable that, from this cause, it has excited high anticipations on the part of the importers, which are scarcely destined to be realized. The examination for alkaloids shows the same proportion to be contained in the flat and in the quill portions of the bark, evidently from the same tree; the chief difference in the chemical contents appearing in the greater abundance of chincho-tannic acid in the quills. The alkaloids weighed as first precipitated, gave in each case twenty-eight grains per 1000, the larger portion of which consisted of the quinidine of Pasteur, together with cinchonine, and a very small percentage of quinine.

The novel course which this bark has travelled suggests questions as to its origin, which can only be answered hypothetically. When Mr. Pritchett was in Huanuco in 1860, he says, "The expectations of the inhabitants were at the highest respecting the future prosperity of the city, *on account of a grand road, which was already commenced,* for connecting the province of Huanuco with the river Ucayali, the largest and most important of the southern tributaries of the Amazon." It is, then, not improbable that we have some of the first results in the present importations. It is not the first time that bark has been sent down this river-navigation of some thousand miles to the Atlantic.

The produce of the forest of Huanuco has often been attempted to be passed off for Calisaya (as I have described under the head *C. nitida* in my "Illustrations of Pavon's Quinologia.") I have specimens of this dated as far back as 1846. In MM. Delondre and Bouchardat's "Quinologie" will be found very full information on this subject, under the head Quinquina Huanco plat, p. 27, also pl. iv. M. Delondre says, "No species resembles more, at first sight, the bark of Bolivia, and for a long period those who collected it sold it as true Calisaya. It is, doubtless, the species described by Ruiz and Pavon as the *C. nitida,* and to which they attributed a very superior quality. The surface is of a tawny yellow, uniform with longitudinal marks, less distinct than the Calisaya. The texture of the inner surface is less compact than this last. The transverse fracture is of a more pink color, the fibres are shorter, but do not easily detach themselves. When chewed, the bitterness readily develops itself; the taste is slightly poignant without astringency." This description, together with M. Delondre's plate, accord sufficiently well with the present specimens (presented to the Pharmaceutical Museum)* to allow of its being produced by

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* These specimens were exhibited at the meeting, and their characteristics briefly alluded to by Professor Bentley.

the same tree, of which (*C. nitida*) Mr. Pritchett brought back a fine but perhaps varied specimen from Tingo, some thirty miles lower down the river than Huanuco, and possibly the site of the present gathering.

I think, therefore, that we must in all probability seek for the source of the present importation in the *nitida* barks of the Huanuco district. At the same time, it is not at all improbable that other species of bark may find their way, ultimately, down the numerous affluents of the mighty Marañon, even from the forests of Bolivia and of Cochabamba. The present will scarcely repay the importers. M. Delondre gives, as the result of some experience, the produce as fifteen to twenty grammes of sulphate of quinine, and eight to ten grammes of cinchonine per kilogramme; a produce which accords very well with that which I have found in the present parcel, bearing in mind that M. Delondre includes *quinidine* under the head *quinine*, as he himself tells us (pp. 30, 37),—a fact which detracts from the value of his otherwise very valuable work.—*Lond. Pharm. Journ., Dec.*, 1863.

Editorial Department.

Our Journal.—With the present number begins the thirty-sixth volume of this Journal, which has continued uninterruptedly since April, 1829. In its earlier days, when the material for supplying the pages of such periodicals was much less abundant than at present, the work was smaller, and involved less outlay of capital to carry it on; yet, from the sparsity of its subscribers, it was a burthen to the College. In process of time it became self-supporting, and at the commencement of the year 1860 was yielding a moderate surplus, which aided the Trustees of the College in reducing the debt on their building. Owing to the large reduction of the subscription list since the rebellion, the income of the Journal has ceased to meet its expenses, and has again become in part a burthen to the College. This condition need not to have occurred if all our subscribers had been faithful to their obligations in forwarding their dues within a reasonable time after they were justly due. Our books exhibit delinquencies of this kind to the amount of about $1600, independent of that due from Southern subscribers, varying in sums from six to thirty dollar or from two to ten years' subscriptions. It is therefore with earnestness that we appeal to this class of our subscribers, in the hope that they will come forward and square their accounts *now* that aid is needed. It has been our aim to make this Journal a record of the progress of pharmacy and pharmaceutical chemistry, without introducing much that merely caters to a taste for novelty or business fashion. There are some subscribers who value a pharmaceutical journal solely in proportion to the material it contains that is conducive to business. Hence they hail the appearance of recipes for preparations of various kinds with pleasure and approval. Without abandoning the plan upon which this Journal has been conducted for so long a series of years, it is intended to introduce, when such offer, notices of apparatus, processes, and preparations, under the name of Pharmaceutical Notices ; and we shall be pleased to receive contributions to this chapter from any of our readers or friends who may have something to communicate which may be deemed too little for a paper.

To the Editor of the American Journal of Pharmacy.

Sir,—An old subscriber, and constant reader of your excellent *Journal of Pharmacy* wants information on one or two points, and if you, or any of your readers, will furnish it in an early number, you will much oblige me and several professional friends.

Jeremie's Solution of Opium, p. 242, and Tincture of Sumbul, p. 244, are neither of them officinal, but are referred to in Braithwaite's Retrospect, part 47, July, 1863, but not known in Drug Stores. What are they? and where described ?

Farradism is now frequently spoken of as a new mode of applying Electricity to medical purposes; but no one seems to know the nature of it; likewise the nature of the machine for producing it, by Legendre and Morin. Is it made in this country? and where? Where can a general description be found, or can you furnish one? It will much oblige.—Page 243, Vol. above mentioned.

Since the invention of the Spectroscope in 1860, by Bunsen, in Germany, several new metals have been discovered. Information is wanted of the nature and operation of this instrument; where is it described? and how used? and if for sale in this country? &c.

We are not acquainted with "Jeremie's solution of Opium," and none of the authorities within our reach allude to its composition. "Tincture of Sumbul" is made of the strength of tincture of valerian, which it resembles. A formula for fluid extract of Sumbul (or musk-root) was published at page 233, vol. 3d, third series of this Journal, and articles on musk-root itself in vol. xvi. and xxiii. of the previous volumes.

The fluid extract is the form in which this singular product of Asia has been employed pharmaceutically in Philadelphia. Dose of the fluid extract 15 minims to half a fluid-drachm. This is equivalent to 7½ to 15 grs. of the root.

Farradism is a name given by M. Duchesne, of Boulogne, to the induced magneto-electric current applied as a therapeutic agent, and so called to distinguish it from the mechanical electrical current on the one hand, and the galvanic or chemical electrical current on the other. Our correspondent will find a full account of the apparatus, illustrated by a wood-cut, and its mode of application, together with the theory of its action, at page 507, vol. i., of Prof. Wood's Therapeutics and Pharmacology, ed. 1856, and Messrs. McAllister, Chestnut street, Philada., can give him the information of its cost, etc.

The *Spectroscope* of Bunsen was described and figured in this Journal for May, 1861, to which our correspondent is referred. We would also inform him that Prof. Robert Bridges, of the Philadelphia College of Pharmacy, has a good Spectroscope in working order at the Hall of the College, and would give our correspondent an opportunity to witness its wonderful powers if applied to. Dr. Bridges has specimens of salts of several of the new metals prepared for the Spectroscope. McAllister (as above) imports the instrument, and we believe some excellent instruments have been made in this country.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—We acknowledge the reception of a pamphlet of 36 pages, exhibiting the present condition and scope of this Institution, and embracing extracts from the Charter, Pharmacy Act, and By-Laws of the Society, and the regulations of the Board of Examiners of the School of Pharmacy, etc. We have not space to devote to an analysis of this pamphlet, but will say that it exhibits a prosperous condition of the Pharmaceutical Society, and an outline of the labors carried on under its auspices, in its School of Pharmacy, its Museum, its Laboratory, and the various examinations imposed on it by the Pharmacy Act, etc. With ample means, and a large and varied amount of talent in the ranks of its members, this Society has made great advances in the improvement of our scientific art, and has shed its light freely for the advantage of the profession at large.

The Medical Formulary: being a collection of prescriptions, derived from the writings and practice of many of the most eminent physicians in America and Europe, together with the usual dietetic preparations and antidotes for poisons. To which is added an appendix on the endermic use of medicines, and on the use of ether and chloroform. The whole accompanied by a few brief pharmaceutical and medical observations. By Benjamin Ellis, M. D. Eleventh edition, carefully revised and much extended, by Robert P. Thomas, M. D., Prof. Mat. Med. in the Philadelphia College of Pharmacy. Blanchard and Lea, 1864; pp. 341, octavo.

One of the best tests of the practical usefulness, or general merit of a formulary is, that it sells well, that it is sought for by medical men as suggestive of remedies in cases that are daily presented in practice, and that its suggestions have proved reliable and useful. Measured by this rule, "Ellis's Medical Formulary" must be considered one of the very best. A comparison of this edition with the previous one, and especially with the older editions, will exhibit marked changes, and many improvements. Obsolete or disused formulæ have been omitted, and many new recipes, from printed or private sources, introduced, the nomenclature corrected to correspond with the new Pharmacopœia, and the table of doses, first introduced by Dr. Thomas, carefully revised.

OBITUARY.

PROF. EILHARD MITSCHERLICH.—Prof. Mitscherlich has recently died at Berlin at the age of sixty-nine. He had long been known as one of the ablest philosophical chemists of the day, and the estimation in which he was held was exemplified by the numbers who attended his classes in the University of Berlin, and the Friedrich-Wilhelm's-Institut in that city. The mere titles of his writings would occupy nearly two columns of this journal; they embrace a wide range in chemical science, and may be found in the publications of the Academy of Sciences of Berlin, of which he was a member, and in German periodicals. Besides these, he was the author of a "Lehrbuch der Chemie," in two volumes, which has passed through two editions, and has been translated into French. Dr. Mitscherlich was elected a Foreign Member of the Royal Society in 1828; and in 1829 one of the Royal Medals was awarded to him for his "Discoveries relating to the Laws of Crystallization and the Properties of Crystals." It is, perhaps, by his researches into the phenomena of dimorphism that he will be best remembered.—*Am. Jour. Science and Arts, Nov.*, 1863, from *Athenæum*, No. 1876, p. 470.

PROF. THEODOR W. C. MARTIUS.—We have to announce with regret the death of this amiable and well-known man of science, which took place, after a long and suffering illness, on the 15th September. Dr. Martius held for many years the Professorship of Pharmacy and Pharmacognosy in the University of Erlangen; he was a Knight of the Royal Prussian Order of the Red Eagle, and member of many scientific societies, including the Pharmaceutical Society of Great Britain, to whose Museum and Journal he frequently contributed.—*London Pharm. Jour., Oct.* 1863.

Catalogue of the Class of the Philadelphia College of Pharmacy.

FOR THE FORTY THIRD SESSION, 1863-64.

With a List of their Preceptors and Localities.

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Hillary, John F.	“	“	Wm. Hillary.
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THE

AMERICAN JOURNAL OF PHARMACY.

MARCH, 1864.

PRACTICAL AND SCIENTIFIC NOTES.

By John M. Maisch.

Preservation of Gum and Starch Paste. The paste made by gum tragacanth and gum arabic, which is so extensively used by the apothecaries in this country, acquires, particularly during the warm season, a very unpleasant and even offensive odor in consequence of fermentation, which soon commences on exposure to the air. Oil of cloves, alum and other essential oils and salts are frequently added to counteract this tendency, with but partial success, the volatile oils merely hiding to a certain degree the offensive odor developed, and retarding the fermentation incompletely. For some time past I have availed myself of the antiseptic property of creasote, which may be added to these pastes recently made, until its odor is faintly apparent. The result is their perfect preservation, no offensive odor being disengaged, and their adhesiveness is not impaired by keeping them for months.

Fluid extract of Colchicum Seed. Before it had been adopted for the present Pharmacopœia, and while engaged with Dr. E. R. Squibb, of Brooklyn, N. Y., I have made considerable quantities of this fluid extract, and have found that the formula, as it now stands, is the best in its results. On examining the finished preparation, it will be observed that it is turbid, and it cannot be obtained clear by filtration through a dry or moistened filter. The only method to obtain it in a clear state, is to allow it to stand undisturbed for several days, when it will be found to have separated into two layers, the upper of which is of a greenish brown color, and oily in its nature. This is to be separated by syphoning off one stratum, and by means of a separatory funnel.

From 188 lbs. avoird., we obtained, at the U. S. Army Laboratory, six pints of this oil, which I intend to examine as soon I can find the necessary time for doing so. Meanwhile, I may state the result of a few experiments made with it.

Two pints were introduced into a glass retort with a thermometer inserted, and a carefully regulated heat was applied. The oil commenced to boil at 184° F., at which point the temperature was kept for some time; but when boiling had almost entirely ceased, the temperature was allowed to rise gradually. Boiling recommenced briskly at 186°, and the temperature rose within two and a half hours to 196°. During all this time alcohol distilled over; the concussions finally became so violent that the distillation had to be discontinued. The alcohol measured 10 fluidounces, had at 65° a specific gravity of .850, and was almost free from foreign odor. The remaining oil was of the original color, only a shade darker; its specific gravity at 60° is ·9069; it dissolves almost in all proportions in alcohol of ·850 and below, but is very sparingly soluble in diluted alcohol. From the manner in which it has been originally obtained, it is evident that it has the property of taking up some stronger alcohol when left in contact with diluted alcohol. When agitated with solution of ammonia, it forms a soft, pasty compound.

Veratrum viride. One hundred pounds of corms and roots of this plant were received, nearly every specimen of which had a portion of the dead stalk attached to it. I had the latter cut off, using only corms and rootlets in the preparation of the fluid extract. The stalks, weighing 11½ lbs., I intended to utilize by preparing veratria from them. I boiled them twice in water acidulated with sulphuric acid, expressing strongly each time. The liquid was concentrated by evaporation and treated with strong alcohol, when a copious precipitate was obtained, which contains a body analogous to saponin, if not identical with it; for its watery solution froths considerably. The alcoholic solution was treated with slacked lime, and a portion of the filtrate which ought to have contained the veratria was evaporated, the residue taken up with water acidulated with a little muriatic acid, and tested with phosphomolybdic acid and with iodohydrargyrate of potassium; both reagents had no effect. Astonished at the unexpected result, I exhausted some of the lime precipitate by boiling alcohol, and treated the filtrate in the same way; I likewise tested the solution of the precipitate caused by alcohol, but without any better result.

It is evident, therefore, that the dead stalks of Veratrum viride contain no alkaloid, and their careful removal previous to preparing the fluid extract is indispensable. If time permits, I shall try to isolate the saponaceous principle.

Solanum pseudocapsicum. During last fall I gathered from this shrub some berries, which are commonly known by the name of Jerusalem cherries. The following are the results of some preliminary experiments, instituted previous to an intended analysis, for which, however, I have not yet found the time. When the ripe berries are treated with water, a lemon-yellow, slightly turbid liquid is obtained, which has an acid reaction, and is not disturbed by iodohydrargyrate of potassium, except after considerable concentration. It was supersaturated with carbonate of soda and agitated with ether, which, on spontaneous evaporation, left a light orange-yellow mass, consisting, most probably, in part of coloring matter. A portion of it was dissolved in muriatic acid, and now gave evidence of the presence of an alkaloid by causing precipitates when treated with Mayer's and Sonnenschein's tests. The behaviour of this impure alkaloid towards some tests is as follows:—Nitric acid produces no alteration; sulphuric acid causes a brown, afterwards black color; bichromate of potassa and sulphuric acid develops gradually a green color in consequence of the reduction of chromic acid to the oxide.

Several cases of poisoning by Jerusalem cherries have been reported; it is to be presumed that this alkaloid is the poisonous principle.

The pulp, which had been exhausted by water, was treated with strong alcohol, which acquired a beautiful orange color; the treatment was continued as long as the alcohol was colored, but the epidermis of the berries retained its original red color. The residue was now digested with aqueous and with alcoholic solution of potassa, which, however, appeared to have no effect on the coloring matter.

Philada., January, 1864.

COMPOUND SANTONIN LOZENGES.

The following receipe has been furnished to us for publication as that used by Mr. Fougera, of New York, in making his "Dragées de Santonine Composées" used as a Vermifuge.

		Grammes.
℞.	Santonin,	25·00
	Jalapin,	10·00
	Pulv. Gum Arabic,	30·00
	Chocolate, pure,	60·00
	White Sugar,	160·00
	Water, q. s. about,	15·00

Make a pilular mass, divide into one thousand pills and coat with sugar. Latterly, jalapin has been replaced by the resin of gamboge, owing to the scarcity of the former.

IMPURITIES AND ADULTERATIONS.

Noticed at the U. S. Army Laboratory, Philadelphia.

By Jno. M. Maisch.

(Read at the Pharmaceutical Meeting of the College, Feb. 1, 1864.)

It is well known that stones and bullets are occasionally met with in crude opium; they are, however, so few in number, that their presence must be ascribed rather to accident than to design. Lately, we received from one of the medical purveying depots a parcel of opium mostly done up in half and one pound packages, and some in the original cakes evidently unbroken; one of the latter, previous to being rolled out to prepare it for drying, was broken and found to contain within the space of a few cubic inches, not less than sixteen lead bullets, weighing probably 7½ ounces. These have evidently been incorporated for the fraudulent purpose of increasing the weight. I have no means to ascertain whether other or all the cakes of the same case were rendered heavier by the same means.

Buchu may be occasionally found in commerce mixed with green portions of the stem, the flowers, and sometimes capsules of the Barosma. A bale of the short-leaved variety which I prefer for pharmaceutical preparations owing to the larger amount of volatile oil it contains, was found mixed with about five per cent. of the ripe capsules and seeds, but was free from stems and flowers; the capsules are nearly inodorous but have a hot aromatic taste; the seeds have but a very slight taste of buchu and are odorless. At another time, a bale of the medium sized leaves were found to contain in the centre some large stones weighing about ten pounds.

Simple Cerate. A large lot of simple cerate which had been furnished to one of the medical purveying depots previous to the establishment of the laboratory, had turned rancid in a short time. On examining it, I found it to be of a uniform texture, apparently of nearly the proper consistence, but becoming readily soft by the warmth of the hand; it had a somewhat diaphanous appearance and dissolved readily and completely in ether at the ordinary temperature. It was made from lard and Japan wax, which latter, it will be remembered, is a true fat consisting chiefly of palmitin, and consequently soluble in cold ether, while the same solvent takes up but traces from true beeswax.

Lard. In this connection I may mention our experience with lard, which was procured from a large manufacturer in this city. In the preparation on a large scale of the officinal Ceratum Adipis there was repeatedly obtained water amounting to from 12 to 15 per cent. of the weight of the lard employed. On remonstrating with the manufacturer, he freely acknowledged that he added one-eighth of water to render the lard white. I had on former occasions become acquainted with this practice; the water is kept in intimate mixture with the fat by the addition of a little carbonate of potassa or borax. But ever since that time we have had no difficulty in procuring excellent lard free from all water.

Copaiva. A small sample of copaiva was sent to the laboratory for examination. It was of about the consistence of olive oil, turbid in appearance and possessed an odor distinctly terebinthinate beside the copaiva. Treated with eight parts of 95 per cent. alcohol only a portion of it dissolved while an oily liquid gradually separated at the bottom of the test tube. This sediment was again treated with 200 times its volume of strong alcohol, with which it yielded a turbid mixture, gradually separating an oily layer, which produced upon paper a stain easily recognized as greasy and quite distinct from resinous. A portion of the so-called copaiva was slowly evaporated at a moderate heat; the odor developed at first was more like copaiva, but subsequently quite distinct and terebinthinate; the residue was perfectly transparent, liquid, had a bland, afterwards acrid taste, and formed with caustic potassa and ammonia a milky mixture. From these experiments, I pronounced the copavia adulterated with a fixed oil and probably some terebinthinate oleoresin.

Castile Soap. A sample of mottled Castile Soap had a somewhat suspicious appearance; the color of the body of soap was the of a dirtier brown than usual, the intermixed oxide of iron had a dull reddish brown color only on the outside of the bar, while the interior retained its black color for four weeks. 200 grains of it in its commercial state without previous desiccation, were incinerated; the ashes weighed 90 grains, which shows the enormous amount of 45 per cent. of inorganic constituents aside from the water. The ashes were but partly soluble in water, and the solution contained soda, a little potassa, carbonic and some muriatic acid; the solution was evaporated to dryness in the presence of muriatic acid and the residue taken up with acidulated water, when a trace of silica remained undissolved; it was entirely free from lime and sulphuric acid.

The undissolved portion was partly soluble in nitric acid and this solution afforded abundant evidence of the presence of lime; no sulphuric acid was found, but on supersaturating with ammonia, a dense white precipitate appeared again. I did not go any further for want of time to ascertain whether the portion dissolved by nitric acid was phosphate of lime or not.

That portion of the ashes which had not been taken up by water and cold nitric acid, was fused with pure carbonate of potassa, which combined with some silica, leaving a portion of lime and oxide of iron behind.

200 grs. of the soap was dissolved in boiling 85 per cent.

alcohol, the hot solution thrown upon a filter and the filter washed with hot alcohol; the undissolved portion after washing and drying weighed 47·5 grains, was of a brownish grey color and free from organic compounds. The alcoholic filtrate, measuring five fluidounces, solidified on cooling to a transparent mass like opodeldoc.

These experiments prove that this so-called Castile soap has been made of animal fat and was probably adulterated with some silicate of soda, which must have been decomposed again by the lime; but for what reason and in which form the lime had been added, I cannot conceive; it did, however, as will be seen from the foregoing experiments, not interfere with the detergent properties of the soap, acting merely as a diluent.

Philadelphia, January, 1861.

EXTRACTS FROM GERMAN JOURNALS.

By Geo. J. Scattergood.

On the detection of alcohol in volatile oils.—The employment of sodium as a means of detecting alcohol in chloroform has suggested to Dragendorff, the use of this reagent in ascertaining the presence of alcohol in volatile oils. Upon placing a small piece of sodium in perfectly pure non-oxygenated volatile oil, no other change takes place at first than the disengagement (in some cases only) of a few bubbles of gas, due probably to a small amount of water, which some of these oils may contain. After the lapse of some hours or of some days, exposed in an uncovered test tube, the sodium becomes covered with a brownish, resinous coating, while the oil retains its original color. When, however, the sodium is brought into contact with an oil containing but a few per cent. of absolute alcohol, a lively disengagement of gas is at once perceived; in the course of which the pieces of sodium are brought to the surface of the liquid. Upon the addition of the sodium a milkiness is almost immediately produced in the oil, which always disappears, and the oil sooner or later acquires a yellow color. After some hours, and often after some minutes, only the oil containing alcohol becomes brown, and much less fluid, and in some cases so thick as not to flow out of the tube when inverted. By these reactions, Dragendorff was able to detect in non-oxygenated oils a very small amount of absolute alcohol, (5 to 10 per cent.) The admixture of 3 to 5 per cent. of castor oil, poppy, or sweet oil, does not affect these reactions.

If the oil has previously become somewhat resinified, the oil may remain colorless, but the pieces of sodium will become covered sooner—in 5 to 10 minutes—with the resinous coating, which may be separated from the sodium by shaking. In unresinified oils this does not take place for 18 to 24 hours, and in many cases a method is thus furnished for ascertaining whether resinification has taken place. Even in volatile oils, containing oxygen, the behavior towards sodium affords a more or less accurate test for the presence of alcohol. Disengagement of gas, cloudiness, and subsequent browning and thickening being produced upon the addition of sodium to such oils contaminated with alcohol. In the pure oils this coloration is not produced for some hours. The author has applied this method of testing successfully to many of these substances, in ordinary use, among which are oil of turpentine, lavender, rosemary, caraway, bergamot, distilled and expressed lemon, peppermint, sassafras, cubebs, mace, origanum, cajeput, fennel, orange-peel, wintergreen, rose, anise, cassia, cloves, copaiba, savin, &c. &c.—(Pharm. Zeit. f. Russland, in Vierteljh. für prak. Ph. Bd. xiii. p. 26)

On Freezing Mixtures.—Joseph Hanamann (Vierteljahres. f. prak. Ph. B. xiii. p. 3,) gives a series of interesting results upon the degree of cold produced by the sulphates, chlorides and nitrates of the alkalies, upon solution in water. These salts, in a finely divided, crystalline, chemically pure state, were dissolved in equal weights of water, kept at an uniform temperature with the following results:

Name of salt.	*Temperature at Mixing.*	*Decrease of Temperature.*	*Time in Reaching Lowest Temperature.*
Sulphate Ammonia	62° Fahr.	14° Fahr.	45 seconds.
Chloride ammonium	62° "	25° "	40 "
Nitrate ammonia	62° "	45° "	30 "
Sulphate potassa	66° "	8° "	60 "
Chloride potassium	64° "	21° "	45 "
Nitrate potassa	62° "	18° "	45 "
Sulphate soda	64° "	13° "	30 "
Chloride sodium	62° "	7° "	
Nitrate soda	62° "	17° "	30 "

From this series, the average results of which only are given above, this observer concludes :

1st. The rapidity with which the temperature is lowered is in direct proportion to the solubility of the salt.

2d. The ammonia salts produce the greatest cold, next the potash salts, and then the soda salts.

3d. Reduction in temperature is greater when increased quantities of salt and water (in the same proportion) are employed,—in the ammonia salts ; is unaffected by the amounts used in the potash salts, and is less in the soda salts, as the weights of both salt and water are increased.

On mixing two of these salts together and performing another series of experiments, with a weight of water equal to the joint weight of the salts, the following results were obtained :

Sulphate of soda and nitrate of ammonia reduced the temperature	47°	Fahr.
Chloride of ammonium “ “ “	40°	“
Chloride of potassium “ “ “	36°	“
Nitrate of potassa and chloride of ammonium “	36°	“
Sulphate of soda “ “ “	34°	“
Nitrate of soda “ “ “	30°	“
Chloride of potassium and nitrate of soda “	20°	“
Sulphate of soda “ “ “	18°	“
Nitrate of potassa and chloride of sodium “	18°	“
Nitrate of ammonia and nitrate of potassa “	40°	“

A few experiments were likewise tried with a mixture of three salts, the latter being in equal amount, and, together, equal to the weight of the water they were dissolved in. Under the the most favorable circumstances, i. e. when the amounts used were largest, the results were as follows :

Sulphate soda, nitrate of ammonia and nitrate potassa, the temperature sank	47°	Fahr.
Chloride ammonium, sulphate soda, and nitrate potassa	41°	“
Nitrate potassa, nitrate soda, and nitrate ammonia	48°	“

Condensed from Wittstein's Viertiljh. f. prak. Pharm. Bd. xiii. p. 3.

Rendering Castor Oil tasteless.—It is stated by Stan. Martin that the disagreeable taste of this oil may be concealed, by beating it well up with the contents of an egg, and adding a little salt, or sugar, and a few drops of orange flower water.

Pencils of Sulphate of Copper.—These may readily be formed, according to K. Calmberg, by triturating briskly together four parts sulphate of copper, and one part borax. The water of crystallization given out unites the two into a plastic mass, which may be moulded as desired.

On the adulteration of spices.—Dr. H. Schröeder states that microscopical examination affords the best test for the adulteration of spices. It is necessary, however, in the first place to become acquainted with the appearance not only of the genuine articles, but also of the substances used in sophistication. Dr. S., has examined a number of samples of commercial spices, with the following results:

Black Pepper.—Of 42 specimens, 10 only were found to be entirely pure. Rape seed oil cake, burnt and ground acorns, dried and ground bread crusts made up a large part of the remainder. Under a power of 60 diameters, the thin brown seed coats of the rape seed were plainly seen: by a power of 200 diameters, the starch grains of the acorns and bread crusts were readily recognized by their size and shape.

Ground Cloves.—6 samples, out of 40 examined, were found to be unadulterated. Clove stems, sandal wood, brick-dust, pimento, ground acorns, bread crusts, oil cake, and cloves deprived of their oil, were found to be largely mixed with the cloves. 3 specimens contained no cloves at all, but owed their smell to a few drops of the oil. 10 specimens were mixed with some fixed oil, in order to give to a worthless powder an oily appearance. This adulteration may be readily detected by the permanent stain which such a mixture gives to paper on which it is rubbed. Clove stems and cloves, when triturated with iodine and iodide of potassium in solution, show under the microscope no starch grains at all—or at most—but a few scattered ones; on the other hand, in ground acorns and bread crusts they are readily seen. In pimento, they are enclosed for the most part in the cellular tissue. Under 200 diameters, the clove stems display a multitude of elongated cells, and spiral vessels; pure cloves contain neither these elonglated cells, nor spiral vessels. Brick-dust and sandal wood under a power of 60 diameters may be directly observed.

Ground Pimento.—Of 35 samples, 12 were pronounced pure. The foreign material in the others, appeared to be clove stems, sandal wood, other colored woods, oil cake, and perhaps chicory coffee.

Ground Cinnamon.—This spice seems to be adulterated with many kinds of wood; mahogany and cedar wood have been recognized in the commercial article, though the substitution of inferior kinds, in the place of the finer varieties of this bark appears to be the most common method of sophistication. 15 samples out of 42 examined, proved to be genuine Chinese cinnamon.

Ground Ginger.—9 samples out of 32 examined, were composed of pure bleached ginger. 13 specimens contained the flour of peas, lentils or beans. 2 lots consisted entirely of turmeric. By the aid of polarized light and a magnifying power of 200 to 500 diameters, the starch grains of the peas, lentils and beans were readily distinguished from those of the ginger. By a power of 200 diameters the yellow colored cells of the turmeric may plainly be recognized.—Polyt. Centrallehalle, Vierteljh. Ph. Bd. xiii. p. 85.

GLEANINGS FROM GERMAN JOURNALS.

By John M. Maisch.

Nitrates in Marsh's Apparatus.—Dr. Rieckher found that metallic bismuth is separated in the apparatus if nitrate of bismuth, zinc and chlorhydric acid react upon each other, and that scarcely any hydrogen is evolved which reduces the oxide of bismuth and the nitric acid; the latter is found in the contents of the flask as ammonia. The author believes this to be a good method for the direct estimation of nitric acid in nitrates, nitrous ether, &c.—(N. Jahrb. 1863, July 3.)

Carbonate of Potassa, nearly pure, is prepared by O. Wirsching by deflagration of a mixture of two parts pure nitrate of potassa and one of charcoal. Hager recommended some years ago to purify charcoal by washing it with dilute muriatic acid and then use one part of it to 3 of pure saltpetre.—(Neues Jahrb. f. Ph. xx. 17.)

Analysis of Canary Seed.—Jos. Hanamann found in the dry seed of Phalaris canariensis fat 5·30, resin and extractive 5·42, dextrin and sugar 2·44, starch 54·45, protein compounds 18·75, cellulose 9·65, mineral constituents 5·19 and traces of citric and oxalic acids. The air dry seeds contained 11·5 per cent. moisture. The ashes yielded 61·63 silicic acid, 24·304 phosphoric acid, traces of sulphuric acid and chlorine, 4·793 potassa, 3·043 soda, 3·749 magnesia, 1·459 lime, ·144 alumina, ·273 ferric oxide and a trace of manganium.—(Wittst. Viert. Schr. 1864, 517—522.)

Persian Insect Powder.—Heller and Kletzinsky stated in 1856, that the floral heads of Pyrethrum carneum, (roseum caucasicum,) which had been collected on Caucasus, contained a volatile oil and santonin as active principles, but no narcotic poison or alkaloid. Jos. Hanamann, corroborates this statement except for santonin which he could not detect; the volatile oil, separated from the distillate by means of ether, is of a pale yellow color, faint aromatic taste, but strong penetrating odor resembling fresh chamomile flowers, it stupefies and kills insects.—(Ibid. 522—525.)

Solubility of Alumina in Ammonia.—Jos. Hanamann has observed that 18752 parts of ammoniawater of 3·93 per cent. dissolves one part of alumina recently precipitated, but that the presence of chloride of ammonium decreases this solubility materially.—(Ibid. 527.)

The berries of Viburnum Lantana, have been subjected to a proximate analysis by J. B. Enz, who obtained tannin coloring ferric salts dark green, valerianic, acetic and tartaric acids, yellow amorphous and hygroscopic bitter principle, acrid principle, red coloring matter, sugar, gum, fixed oil, wax, and chlorophyll.—(Ibid. 528—535.)

Thallium.—The so-called "ice-salt" from Nauheim, Hessia, is a mixture of salts, obtained during the winter from the residuary motherliquor of table salt, and is frequently employed by confectioners for refrigerating mixtures. Professor R. Boettger's analysis proves it to consist chiefly of the chlorides of potassium and magnesium, intermixed with some chloride of sodium, also with thallium, cæsium and rubidium in the form of chlorides; it is the cheapest material for the preparation of compounds of the last two metals. The oxide of thallium is readily soluble and caustic, its carbonate soluble and of an alkaline reaction, its double salt with bichloride of platinum sparingly soluble in water; the thallium-alum crystallizes in octohedrons; all these facts, as well as its being a frequent companion of potassium, sodium, rubidium and cæsium give it a place among the alkaline metals.—(Ibid. 535—536.)

The leaves of Zostera marina, Najadeæ, known in commerce under the name of seagrass, yield according to E. Baudrimont, after drying at 212 of, 23·28 per cent. ashes, consisting of 24·20 silicic acid, 20·45 free lime, 20·41 chloride of sodium, 9·54 phosphate, 5·38 carbonate, 2·07 sulphate of lime, 4·21 chloride and 0·83 iodide of potassium, 3·81 sulphate of potassa, 1·79 ferric oxide, 1·54 magnesia, ·26 alumina, and traces of bromide, sulphides and cyanides, the balance was charcoal and loss.—(Ibid. 543, from Journ. de Ph. et de Chim. xlii. 388.)

Cauterizing sticks of sulphate of copper, may be formed, according to A. Calmberg of Darmstadt, by triturating 4 parts of this salt with one part of borax. By the water of crystallization the mixture forms a paste which can be rolled out to sticks of any desired length. If it should become too dry, the addition of a few drops of water will reproduce the requisite consistence.—(Ibid. 543.)

The volatile oil of German Chamomile flowers, Matricaria chamomila, has again been examined by G. Bizio, (Berichte d. Wien. Acad. xliii. 292.) It is of a beautiful blue color, congeals at —20° C. (—4 F.), turns green with diluted muriatic and nitric acid, reddish-yellow with concentrated sulphuric acid, yellowish white and tough with chlorine, red-brown and thick with iodine, and brown and elastic with bromine. The boiling point rises from 240 to 300° C., at which temperature it decomposes leaving a resinous residue. It is little altered by fusing potassa, distilled with anhydrous phosphoric acid, a nearly colorless oil is obtained having the odor of petroleum, and the composition $C_{20} H_{16}$; the composition of the original oil is $5C_{20} H_{16} + 6$ HO.—(Ibid. 550.)

The hydrates of chromic oxide have been again examined by

Siewert (Zeitschr. f. d. ges. Naturwiss. xviii.) The light blue precipitate obtained hot or cold from a dilute solution of chromic oxide by ammonia, is after drying $Cr_2 O_3 + 7$ aq.; dried in vacuo it retains 4 aq., and after heating to 200 or 220°C., with the entire exclusion of oxygen, it is $Cr_2 O_3 +$ aq., of a bluer color, with a tint of grey, and insoluble in boiling dilute muriatic acid. Heated to the same temperature in contact with the air, a black powder is obtained, being a mixture of several compounds and of variable composition. The pure hydrate is insoluble in ammonia ; a compound of the two, however, may enter into combination with a salt of ammonia, and is then soluble in ammonia water. Fremy's so-called metachromic oxide still contains ammonia and ammoniacal salt. A green modification of chromic oxide does not exist ; the precipitate retains soda or potassa.—(Ibid. 553).

Crystals in Vegetable Tissues.—Dr. Flückiger (Schweiz. Wochenschr. f. Ph. 1862. Nos. 8 and 9) agrees with Kindt, that the crystals in quillay bark are oxalate of lime ; the bark contains also some tartrate of lime. The crystals in guaiac bark are likewise oxalate of lime. Tamarinds are free from oxalic acid, but contain some starch ; the crystals which are met with, consist of tartrate of lime.—(Ibid. 569).

Castor oil may be given, according to Stan. Martin, with eggs to persons who cannot take it in the usual forms. The necessary quantity of the oil is mixed in a flat pan with one or two eggs, and then heated with constant stirring. The Chinese use castor oil in the preparation of their victuals; it has no purgative action on them, they having become accustomed to its use from childhood.—(Ibid 572).

The reduction of salicylous acid to saligenin may be effected, according to A. Reineke and Beilstein, by treating the acid with a little water and sodium amalgam. After several days, hydrogen commenced to be evolved and the salicylous acid had disappeared from the alkaline liquid. It was neutralized with sulphuric acid, carefully evaporated, and the residue treated with alcohol, which, on evaporation, left saligenin, recognized as such, by its reactions and by ultimate analysis. The following equation shows its formation ; $C_{14} H_6 O_4 + H_2 = C_{14} H \ O_4$. If saligenin is regarded as the alcohol of salicylic acid, the above reaction agrees with the well known cases of reduction of the aldehydes.—(Ann. d. Chem. und Ph. 1863, No. 179).

Decompositian of chloride of ammonium by boiling.— R. Fittig has instituted a series of experiments, taking all due precautions with regard to the purity of the materials and apparatus, and comes to the conclusion that at the boiling point, a solution of chloride of ammonium becomes acid by the decomposition of this salt and the elimination of ammonia, and that the amount of ammonia evolved decreases with the duration of the experiment, most probably in consequence of the contiguous evaporation of some muriatic acid, which combines again over the surface of the liquid with an equivalent portion of ammonia, so that the distillate is free from chloride.—(Ibid. 189—193).

Preparation of Bromides.—Liebig's well known method of preparing iodides with the aid of phosphorus (see Am. Jour. Ph., p. 289 and 437), has been employed by Dr. F. Klein for bromides with favorable success.—(Ibid. 237—240).

Expressed oil of Nutmegs. A. Ricker obtained from four pounds of nutmegs, by two expressions between heated plates, sixteen and a half ounces of oil, the residue yielded now only half a drachm of volatile oil, and very little fat. The expressed oil is pale yellow, not yellowish red like the commercial article, possesses a much stronger odor, less fatty to the touch, with greater difficulty absorbed by paper, and solidifies much quicker after fusion, forming warty excrescenses upon the surface. The specific gravity of the former is ·998, of the latter, ·995; the fusing point is 45° C., while the commercial oil liquifies at 41.25°; the saturated solution of the former in boiling ether solidifies to a solid crust, while the solution of the latter remains soft on cooling; the former solution mixed with absolute alcohol and spontaneously evaporated, left microscopic crystals of the form of a cross; the latter did not crystallize. The author believes that the commercial oil is either mixed with another fat, or else nutmegs, previously deprived of the volatile oil, are used in its preparation. He recommends its preparation by the apothecary, not only because a pure, better, and more active product is gained, but likewise on account of economy, the saving being at that time 14 per cent.—(N. Jahrb. d. Pharm. xix. 19).

Test for Atropia.—Gulielmo states that a little atropia dissolved in a few drops of concentrated sulphuric acid, and heated, acquires a brown color, emitting at the same time an intense odor, resembling the flowers of oranges and Prunus spinosa. The odor is particularly evident, if a few drops of distilled water are added, as soon as the brown color and vapors appear.—(Kühtze's Notizen, 1863, Oct. from Schweiz. Wochenschr).

Honey.—C. Kraut induced Dr. Kemper to feed bees with commercial grape-sugar, and he obtained a hard yellowish white honey, less sweet than ordinary honey, which Roeders found to contain nothing but dextrogrape sugar. Wild honey (Heidhonig) contained only invert sugar, that is dextrogrape—and lævo-fruit sugar in equal equivalents. Cuba honey was invert sugar with some dextrogrape sugar in excess. All three were free from cane sugar. It appears, therefore, that the bees are incapable of altering the nature of the sugar, which they convert into honey, unless indeed cane sugar should be split into dextrogrape, and lævo-fruit sugar.—(Ibid. from Zeitschr. f. Chem. und Ph. 1863, 359).

An excellent refrigerating mixture, reducing the temperature to –30°R. (–35.5°F) is obtained according to Reissig, by mixing sulphocyanide of potassium with ice. The salt is reobtained by evaporation.—(Ibid. from Polytechn. Centralhalle).

Solid hydruret of Arsenic.—Dr. Wiederhold obtains this compound, discovered by Davy, by dissolving a compound of five equivalents of zinc and one of arsenic in diluted muriatic acid, when it remains behind in a pure state, retaining only a little charcoal from the metallic arsenic. It is a light voluminous powder of a red-brown color, resembling binoxide of lead, yellowish when finely divided, turning dark-brown in the direct sunlight, insoluble in all simple solvents, decomposed at 200° C. Ignited in the air, it burns like spunk with a yellow color; the residue contains metallic arsenic, arsenious acid, and a little of a black body, containing some, very probably, unknown oxide of arsenic. It burns in fuming nitric acid to arsenious and arsenic acids; cold nitric acid of 1.20 sp. gr. dissolves it, forming the same acids. Other diluted acids are without action. The average of three analyses gave 0.484 per cent. hydrogen.—(Poggend. Annalen, 1863, May, 615).

GLEANINGS FROM THE FRENCH JOURNALS.

By the Editor.

On Tincture of Mustard.—It is well known that a solution of volatile oil of mustard in alcohol is a good rubefacient. This may be procured, more economically, according to M. Barbet, by macerating, during two hours, 250 parts of black mustard flour in 500 parts of cold water, and adding afterwards, 125 parts of alcohol of 86°C., and distil 125 parts of distillate, which will be found to possess a decided rubefacient action.—*Jour. de Pharm. de Bordeaux.*

Jelly of Codliver Oil.—M. Dufourmantle proposes the following recipe for preparing a jelly of this disagreeable medicine. Take of codliver oil, 30 grammes, isinglass, 2 grammes, water, a sufficient quantity to dissolve the isinglass. When the latter is dissolved, add the oil gradually, stirring constantly, aromatizing it at the same time with anise or other oil, four drops. A large table spoonful of this jelly is a dose.—*Jour. de Pharm.*, Janv., 1864.

Anti-asthmatic paper.—Take of leaves of Belladonna, stramonium, digitalis and sage, each five grammes, tincture of Benzoin, forty grammes, nitrate of potassa, seventy-five grammes, water, one thousand grammes. Make a decoction or infusion with the plants, and water, dissolve in this the nitrate of potassa, add the tincture of Benzoin, and mix them. Into this plunge the paper, which, should be unsized and spongy, like filtering paper, sheet by sheet, until a quire is introduced, which, after twenty-four hours' contact, removed, dried, and cut into squares four inches long and two and three-fourths wide, which should be enclosed in boxes, each containing one hundred leaves. Of course it is understood that this paper is to be used by burning it so as to charge the asmosphere breathed by an asthmatic patient with the products of its combustion and volatilization. This paper is sometimes made into tubes by rolling upon a mandril and fixing the edge with paste.—*Bull. de la Société de Pharm. de Bordeaux.*

On the Preparation of Rose water.—M. Monthus states that the petals of the hundred-leaved rose are more odorous as the centre of the flower is approached, and that it might be inferred from this that the rejection of the calyx and exterior petals would improve the product distilled from the remainder. On the contrary, M. Monthus finds that the presence of this organ not only does not injure the quality of the product, but insures its preservation. When thus prepared, rose water is less subject to be filled by mucilaginous matter, which is the source of the alteration of this liquid.

M. Monthus attributes this effect to the astringent principle contained in the calyx which has a coagulating influence on the matter, which prevents it from being carried over in distillation.—*Rep. de Pharm.*

Coriamyrtin.—This is the active principle of Coriaria myrtifolia, as, according to M. J. Ribau, it produces in doses of 0·2 gr., given to a dog, vomiting and horrible convulsions, followed by death in less than two hours. The same effects are caused by subcutaneous injection. The principal phenomena produced by Coriamyrtin, are violent agitation of the head, communicating with all the members, clonic and tetanic convulsions, contraction of the pupil, trismus, and frothing at the mouth. After death the large vessels are found gorged with brown coagulated blood. Coriamyrtin does not irritate the mucous membrane of the intestines.—*Rep. de Pharm.*

ON BREAST PLASTERS.

By Edward Parrish.

There is a frequent demand in practice for suitable emollient, sedative and stimulant plasters, for treating the various stages of phlegmonous inflammation of the mammæ of females, and few prescriptions are more closely scrutinized, by patient and nurse, than those designed for the treatment of this very painful and weakening form of disease.

The old remedy, known as Logan's Plaster, which for many years was almost overlooked, has recently assumed importance in this connection. It is made according to a formula published in my work on Pharmacy, third edition, page 778, by boiling together pure Castile soap, oxide and carbonate of lead, olive oil and butter (without salt) till the proper consistence of a plaster is attained, and then adding a little powdered mastich. Though similar to the simple Diachylon or lead plaster, this is of a more emollient character, free from the tendency to become dry and brittle upon the surface and by its consistence adapted, to be spread and applied without the application of more than a very moderate heat—Logan's Plaster is, moreover, not liable to adhere so tightly as to cause pain in removing it.

In Dr. Dewees' Breast Plaster this is one of the ingredients; a modified formula for this now nearly obsolete remedy is as follows:—

Dewees' Breast Plaster.

Take of Lead plaster, three ounces;
Ammoniac plaster, half an ounce;
Logan's plaster, one and a half ounces;
Spermaceti, } of each two drachms.
Camphor, }

Melt the plasters together, then add the spermaceti and camphor and remove from the fire.

The application of ointments and cerates to the breast as substitutes for plasters is rather objectionable, from the fact that the tissue or skin upon which they are spread so rapidly absorbs the unctuous ingredients, yet Deshler's salve, Ceratum Resinæ Compositum of the Pharmacopœia, is one of the most popular of stimulating applications and is especially recommended by nurses, who acquire considerable familiarity with the treatment of these troubles.

A very favorite stimulating and anodyne application for this purpose is made by the following formula, furnished me by Wm. J. Allinson, of Burlington, N. J., and was formerly much prescribed by my brother, Dr. Joseph Parrish:—

Improved Tobacco Ointment.

Take of Tobacco leaves, five ounces;
Vinegar, a quart.

Digest the leaves in the vinegar till evaporated to half a pint;

strain and express the liquid, then evaporate by moderate heat to about three fluidounces; triturate this with—

Extract of Belladonna, one ounce.

Then take of—

Camphor, in powder, six drachms and a half;
Resin cerate, six ounces and a half.

Mix these by fusion at a moderate heat and incorporate them with the mixed extracts of tobacco and belladonna.*

The following formula is that formerly much in use by Prof. Samuel Jackson, under the name of

Dissolving Salve for Breasts.

Take of—

Extract of belladonna, } of each half a drachm;
Extract of conium, }
Tannin, one drachm;
Soap, } of each three drachms.
Simple cerate, }

Mix together the cerate and tannin; dissolve the soap in a little water, by a gentle heat, add to this the extract previously rubbed down with a little water; then mix rapidly on a warm slab the two parts together.

Of the applications I have had occasion to dispense during several years past, that prescribed by Dr. Ellwood Wilson, consisting of equal parts of Logan's plaster and the officinal Belladonna plaster, seems the best adapted to rank as a standard remedy in mammary abscess, and I have made it the basis of a plaster which I have supplied to physicians for the requirements of country practice.

The proper shape of mammary abscess plasters for general use is a subject requiring some thought, and I have, I think, made an improvement, in explaining which the accompanying cut, from the new edition of my work, will aid. Such plasters are usually made round, varying from seven to eight and a half inches in diameter, with a hole in the middle for the nipple, they then require to be incised at least half way in from the outer edge, so as by lapping the edges to accommodate it to the convex shape of the breast, a method which causes such inequalities

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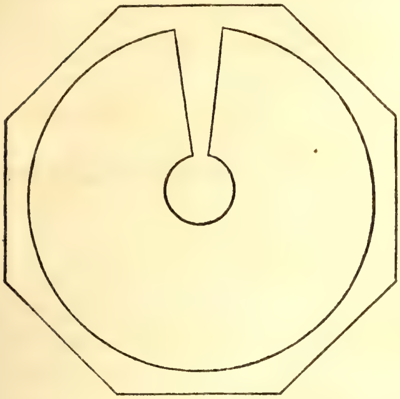
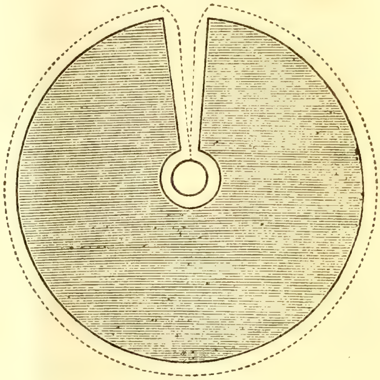
* [See Amer. Journ. Pharm. vol. xxii. page 21.]

as to interfere somewhat with the emollient effect of the plaster.

No. 1.



No. 2.



Of the two figures, No. 1 represents a pattern which may be cut out of stiff glazed paper or preferably made of tinned iron; No. 2, a breast plaster as spread by the use of the pattern. The diameter of the plaster is seven inches, the margin one inch; the orifice for the nipple is placed rather nearer one side than the other, so as to apply the larger portion on the under, swagging portion of the mamma; the strip remaining unspread is designed to be cut open on the dotted lines, No. 2; by opening or closing or overlapping the edges, on applying it the plaster may be made smaller or larger at pleasure, and may be adapted to the convex shape of the breast without nicking it all around as is usually done.

In regard to the material for spreading these plasters upon, I should decidedly prefer chamois skin over any other prepared skin; its softness and flexibility render it greatly preferable to glazed sheep skin. For cerates, thick and highly glazed muslin will serve a good purpose, but it may be required to be nicked to adapt the plaster to the convexity of the mamma. In using a paper pattern to adjust the shape of the plaster it should have a good deal of paste spread on its under surface so as to continue moist till the operation is completed; a paste of gum Arabic will dry too quickly; plaster may be melted in a ladle and poured upon the skin and spread by the aid of a moderately warm spatula; if melted till very fluid the plaster will "strike through" the skin, which will become brittle; if not melted enough it may be too thick and uneven; in no case should it smoke or give off much odor in being melted and spread, this being a sure indication of its deterioration.—*Med. and Surg. Reporter, Feb.* 6, 1864.

ON A NEW KIND OF MATICO, WITH SOME REMARKS ON OFFICINAL MATICO.

By Proefssor Bentley, M.R.C.S. Eng., F.L.S., etc.

Professor of Materia Medica and Botany to the Pharmaceutical Society of Great Britain, etc.

History.—Under the name of *matico, matecô, or matica,* the leaves of several plants are employed by the inhabitants of Central and South America, for arresting both external and internal hæmorrhages, and for other purposes. A nearly similar story is told throughout America, as to the discovery of the styptic property of each kind of matico. It is said, that a Spanish soldier named Matico, when desperately wounded, dragged himself into the shade of the plants near him, and in his agony plucked some of their leaves, and applied them accidentally to his wound, when, to his great surprise and delight, he found in a short time that the bleeding was arrested, and the wound soon healed. From this circumstance Matico has received the Spanish names of "Yerba soldado," and "Palo del soldado," signifying "Soldiers' herb," and "Soldiers' tree." Three plants have been especially mentioned by authors as having received the name of Matico, or Soldier's herb, namely, *Artanthe elongata,* Miq.; *Eupatorium glutinosum,* Kunth;* and *Walteria glomerata,* Presl.† The latter has not as yet been noticed in Materia Medica works, and I have seen no specimens of it; indeed, was unacquainted with it until my attention was recently directed to this kind by Dr. Seemann. Specimens of the two other varieties of matico may be seen in the museum of the Pharmaceutical Society, and are now on the table. The first, namely, that which consists of the leaves of

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* Lindley's 'Medical and Economic Botany,' p. 227.

† Seeman's 'Botany of the Voyage of H. M. S. Herald,' p. 85.

Artanthe elongata, Miq., is the only one that has received any special attention, or the action of which has been tested, beyond its native country. This kind of matico is a native of Peru, where it is very highly extolled as a vulnerary, and for its aphrodisiac and other properties.* It was introduced to the notice of the medical profession in England, as far back as 1839, by Dr. Thomas Jeffreys, of Liverpool,† and it is noticed in a paper by Mr. Morson, entitled "Observations on certain Plants of the genus Piper," which was published, and the plant well figured, in the third volume of the 'Pharmaceutical Journal.'‡ It was subsequently introduced into the Dublin Pharmacopœia in 1850, and formulæ therein given for the preparation of "Tincture" and "infusion of matico." In England it has not been generally much esteemed as a medicinal agent for internal administration, and its action even when locally employed to arrest bleeding, has been regarded by some writers of eminence, as simply mechanical,—the peculiar structure of the leaves of which it is composed, being supposed to divide the blood, and thus promote its coagulation.§ The committee appointed by the Medical Council to frame the forthcoming "British Pharmacopœia" have, however, and as I think properly so, thought matico of sufficient importance to be introduced into the list of Materia Medica to be published in that volume, and have also given a formula for the preparation of "Tincture of Matico." In the States of North America, matico has been much employed of late years, and highly extolled for its power of arresting internal hæmorrhage;‖ and has been introduced into the Primary List of the Materia Medica of the new United States Pharmacopœia, which has been just issued. The fact of matico having thus been, or about to be, introduced into the new United States and British Pharmacopœias, makes everything relating to it of especial importance

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* 'Pharmaceutical Journal,' vol. ii. p. 660.

† 'Lancet,' Jan. 5, 1839, p. 567.

‡ 'Pharmaceutical Journal, vol. iii. pp. 472 and 525.

§ Pereira's 'Materia Medica and Therapeutics,' 4th edit. vol. ii. part 1 p. 397, and Wood & Bache's 'United States Dispensatory,' 11th ed. p. 494

‖ Carson's American Edition of Pereira's 'Materia Medica.'

at the present time, and hence, I have thought it a desirable subject to be introduced to the notice of this meeting.

From the great demand for matico which has recently arisen, in consequence principally of its extensive use in the States of North America, through the war which is now unfortunately desolating that enormous tract of country, it has become scarce and of high price; and indeed, at the present time, true matico—that which is to be officinal in the new British Pharmacopœia—is scarcely to be obtained in any quantity in this country. This scarcity of true matico, and the impossibility of immediately supplying the demand, has probably led to the recent large importation of the leaves of another plant under the same name; and the object of this paper is, more especially, to direct attention to, and to describe that substance.

My attention was at first called to this matico about six weeks since, in consequence of receiving from a well-known herbalist, in extensive business in London, a sample of a drug which had been recently imported, and which consisted of dried broken leaves, some small pieces of branches and a few spikes of flowers. I was requested to inform him as to its nature, and the name of the plant which yielded it. Upon examination, I saw directly, from the odor and botanical characteristics of the drug that it had been derived from a plant of the Order PIPERACEÆ, and most probably from a species of the same genus as that yielding the officinal *matico*. Further examination clearly exhibited that my first conjecture was correct, and that it had been obtained from a species of *Artanthe*. Upon further inquiry I found that some genuine matico, and some of the present drug also under the name of matico, had recently arrived in the 'St. Thomas,' from Colon, a port situated at the terminus of the Panama railroad, on the Atlantic side. The drug had been consigned to a merchant in this city, and was afterwards offered for sale as matico, by a highly respectable firm of brokers. The respectability of all the parties concerned in this country, and elsewhere, who had knowledge of the transaction, and the public manner in which the drug had been offered for sale, showed that no fraud was inended, but that it was supposed to be, either true matico, or a substance allied to, and analogous in its properties to that drug, and probably known in the district from whence it had been forwarded under the same name.

Having now got a clue to the botanical and geographical source of the new drug, I went to the British Museum, where every opportunity was kindly afforded me by Mr. Carruthers of consulting the necessary books upon, and the dried specimens of, the different species of Artanthe which were preserved in the Museum collections. As there are nearly two hundred species of this genus, natives of the West Indies, and of Central and South America, described by Miquel, the standard authority of the order *Piperaceæ*;* and from the fact of my only having some broken leaves, and a few small pieces of the branches and flower-spikes, for examination and identification, the task, as may be supposed, was by no means an easy one. At first, I thought from its having arrived with some genuine matico, and also from the resemblance it bore to a specimen in the Museum collection, marked *Artanthe elongata*, Miq., which was stated to be derived from South America, and obtained from Pavon's Herbarium, that it might be like true matico, also obtained from *Artanthe elongata*. Its marked difference from ordinary commercial matico, however, and a more minute examination, were opposed to this supposition. I then carefully compared my specimen with the other dried specimens of *Artanthe* in the Museum, and after a minute critical examination and comparison with them, I came to the conclusion that it corresponded most nearly with that marked *Artanthe adunca*, Miq. Further examination of Miquel's 'Systema Piperacearum,' as well as the works of Jacquin, Ruiz et Pavon, and of other authors which refer to the botanical characters and geographical sources of *Artanthe adunca*, have satisfied me, so far as it is possible for me to be so, from the examination of the imperfect specimens in my possession, that this new kind of matico is derived either from one of Miquel's varieties of *Artanthe adunca*, or from a species very nearly allied to it, and which can only be determined satisfactorily by the examination of more perfect specimens than

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* Miquel's 'Systema Piperacearum.'

those in my possession. I believe, however, that the species yielding it will turn out to be *Artanthe adunca.*

Since my examination of the above sample, I have had an opportunity of inspecting other samples at the same broker's from which it had been obtained, and I found that all of them consisted essentially of the leaves of the same plant as that just mentioned, but in some there was a little genuine matico, and the leaves, etc., of apparently some other species besides those already alluded to, mixed with them in varying proportions. The following are the synonyms, botanical characters, and geographical sources of *Artanthe adunca,* Miq.:—

SYNONYMS.—*Artanthe odunca,* Miq.; is the *Piper aduncum,* Linn.; *Piper arborescens,* Mil. Dict.; *P. scabrum,* Lam. Ill.; *P. lanceolatum,* Salzmann; *Steffensia adunca,* Kunth; and the *Piper longum, folio nervoso pallide viridi humilius,* of Sloane. The first name is that now generally employed by botanists. In common language it is known under the names of Hooked-spiked Pepper, and Spanish Elder.

Etymology.—The generic name of *Piper* appears to have been derived from *pippul,* the Bengalese name of the Long Pepper, although some authors ascribe it to πεπτω, πεπερι, to digest; that of *Artanthe* is from αρτυμα, seasoning, spice, and ανθος, a flower. The specific name *aduncum,* refers to its curved or hooked spike of flowers. The origin of the common name of Hooked-spiked Pepper is at once manifest; that of Spanish Elder, by which it is known in Jamaica, is derived from its protuberant jointed stems somewhat resembling those of the common Elder.

BOTANY.—The genus *Artanthe* is now universally placed in the Natural Order *Piperaceæ.*

Generic Character.—*Spikes* solitary, opposite the leaves. *Flowers* hermaphrodite. *Style* none. *Bracts* peltate or cucullate.*

Specific Character.—The following description is taken from Miquel:—†

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* Miquel's 'Systema Piperacearum;' and Lindley's 'Medical and Economic Botany,' page 133.

† Miquel's 'Systema Piperacearum,' page 449. Figures of the plant may be seen in Sloane's 'Natural History of Jamaica,' vol. i. p. 135, tab. 87, fig. 2; and Jacquins 'Icones Plantarum Rariores,' vol. ii. tab. 210.

"Ramis ramulisque striatis aspero-verruculoso-punctulatis, junioribus appresse hispidulis, foliis breviter petiolatis, regido-membranaceis pellucido-punctulatis, supra opacis scabriusculis, subtus pallidis puberulis, lato-oblongis vel (summa) sublanceolato-oblongis, plus minus inæquilateris, acuminatis, basi leviter inæquali rotundatis, lineatomulti-(6-7)-costatis, amentis erectiusculis folio brevioribus, falcatim curvatis, pedunculo petiorum quater vel quinquies superante, bracteis peltatis, ciliato-fimbriatis, baccis obovato-tetragonis, vertice subrotundatis, semine conformi leviter areolato."

Miquel also enumerates the following four varieties:—*Forma foliis omnibus lanceolato-oblongis,* from Jamaica; *Forma foliis angustioribus*, from French Guiana; *Forma caule ramisque glabris,* from Porto Rico, etc.; and *Forma foliis rugosioribus et magis scabris,* from Brazil and Bahia. Hence it is evident that the species varies much according to its geographical source, which renders it more probable that, although the new matico differs in some minor details from Miquel's description as given above, as it agrees in the main with it, we are correct in referring it to *Artanthe adunca,* Miq.

Habitat.—Artanthe adunca has a wide geographical distribution throughout the tropical regions of America. It has been found in Jamaica, Barbadoes, San Domingo, Porto Rico, the Caraccas, Surinam, Bahia, Valencia, Guiana, and the Brazils. Its wide geographical distribution is an additional argument in favor of the present kind of matico being derived from it.

GENERAL CHARACTERISTICS.—As imported, this new kind of matico consists chiefly of dried, more or less broken, loosely aggregated or somewhat compressed fibrous leaves; together with a very few flower-spikes; and small fragments of branches. It has a greenish color; a strong, agreeably aromatic, and somewhat pungent odor, in some respects resembling that of true matico; and an aromatic, somewhat spicy, pungent taste.

More minutely examined, the *leaves,* (of which some may be found nearly entire) are then seen to be four, five, or more inches in length, and from one and a half to two and a half inches in breadth. They are oblong, oblong-lanceolate, or oblong-ovate in form, entire at the margins, acuminate-pointed, and somewhat unequal, and more or less rounded at the base. They have short petioles, which are channelled above, rounded beneath, and enlarged at the base, or part by which they were originally attached to the stem, and are commonly somewhat rough, or more or less hairy or pubescent. They have a somewhat membranous texture. Their upper surface is dark-green, opaque, and commonly more or less rough, although in some specimens they are nearly smooth; they are without hairs, and have from four to six somewhat sunken veins, arising alternately on each side of the midrib, and passing upwards parallel to, and approaching each other above, and ultimately terminating at the margins. Towards the base are several other smaller veins, which pass at once to the margins of the leaf. The under surface is pale-green, with prominent light-colored veins, which in number and direction correspond to the veins above; these divide more or less, and give a corresponding, more or less reticulated character to the surface. There are commonly no hairs between the ramifications of the veins (although in some leaves these may be found); but the veins themselves are usually more or less pubescent, and in some cases very evidently so.

The *stalks* are striated, more or less compressed, somewhat rough from the presence of minute tuberosities on the surface, and are furnished at intervals with prominent nodes.

The *flower-spikes* are slender, of a cylindrical shape, yellowish or brownish in color, closely covered with minute flowers, more or less hooked, curved, or twisted, and three or more inches in length.

It will be seen from the above characteristics, that the new kind of matico may be at once distinguished from the officinal and old kind of matico, by the leaves, etc., being in a less compressed state than in it; by their more fibrous nature, which makes them more difficult to reduce to powder; by their upper surface not being so tessellated or rough; and, generally, by the almost entire absence on the under surface of pubescence, and in all cases, far less pubescent character. Hence the tessellated upper surface, and very pubescent character of the lower surface of the leaves constituting true matico, are at once sufficient to distinguish them from the leaves of the new kind of matico.—*Lond. Pharm. Journ.*, Jan., 1864.

ON THE USES OF HYPOSULPHITE OF SODA.

By W. A. Froehde.

The author has found this salt to be a very delicate test for cyanides. In all cases sulphocyanide, sulphuret and sulphate are formed. With cyanide of potassium the reaction is as follows: $2KCy+4(NaO,S_2O_2)=2\ NaCyS_2+2(KO,SO_3)+NaO,SO_3+NaS$. The following shows the decomposition of ferrocyanide of potassium: $2K_2FeCy_3 + 12(NaO,S_2O_2) = 6NaCyS_2 + 4(KO,SO_3) + 5(NaO,SO_3) + NaS + 2FeS$. With an insufficient quantity of the soda salt, cyanate is formed which is decomposed by the heat, carbonic acid being evolved and ammonia found in the residue. With ferridcyanide of potassium, after the previous desiccation of the salts, the result is similar, some sulphurous acid being evolved; otherwise sulphur and sulphurous acid are liberated, and sulphate and ferrocyanide formed according to the following equation: $K_3Fe_2Cy_6 + 2NaO,S_2O_2 = K_2FeCy_3 + Na_2FeCy_3 + KO,SO_3 + S_2 + SO_2$. Prussian blue and Turnbull's blue yield with the hyposulphite sulphuret of iron and sulphocyanide of sodium.

For detecting cyanogen in the solid cyanides, the operation is as follows: a little hyposulphite of soda is fused to a bead; after the desiccation of the salt, a minute quantity of suspected cyanide is added, and heat applied. If the bead of the platinum wire is now placed in a few drops of ferric chloride, an intense blood-red coloration will be produced around the wire, which gradually spreads over the whole liquid. If not heated long enough, some hyposulphurous acid may remain undecomposed and produce with the ferric chloride the well known violet color, which, however, disappears, the ferric salt being deoxidized to ferrous chloride. On the other hand, too long continued a heat will decompose and burn sulphocyanide with a peculiar red flashing flame. This process allows to distinguish cyanide of silver from chloride, bromide and iodide, or to detect it when mixed with the latter.

The above reaction furnishes a ready means for preparing sulphocyanides. One part of ferrocyanide of potassium is mixed with 3·5 parts crystallized hyposulphite of soda, the mixture desiccated and then heated to the complete decomposition of the hyposulphite; hot alcohol dissolves from the residue sulphocyanide of sodium.

Sulphocyanide of potassium is prepared in the same manner from one part desiccated ferrocyanide of potassium and 3 parts anhydrous hyposulphite of potassa.—*Poggend. Annal.* 1863, *Juli*, 317. *Chem. Centralbl.*, 1863, 698. J. M. M.

THE ABSORBENT POWER OF STARCH FOR THE COAL-TAR COLORS.

By W. J. Young.

By adding wheaten starch to a dilute, cold, aqueous solution of mauve, magenta, azuline, &c., the coloring matter is absorbed, and the supernatent liquor rendered nearly colorless, when left in contact for a few hours, with occasional agitation to ensure an equal absorption of the coloring matter by the starch.

In the case of azuline, a moderately strong solution was prepared, and treated with starch as above; every trace of blue was absorbed, and the supernatent liquor had a reddish tinge, due to the red coloring matter which generally accompanies solutions of azuline. When a more dilute solution of azuline was used, every trace of color was absorbed, and the liquor on filtration was clear and perfectly colorless.

The most of the coloring matter may be removed from the starch again by solution in alcohol.

By this process almost every variety of color may be procured —yellow, pink, various shades of red, blue, mauve, &c.—*Lond. Chem. News, Jan.* 23, 1863.

A VOLATILE ALKALOID IN DIGITALIS PURPUREA.

By treating the fresh leaves of foxglove in the same manner by which conia is extracted from hemlock, they yield a volatile alkaloid, which the discoverer, W. Englehardt (Zeitschrift für Chemie u. Pharm. 1862, December, p. 722) has named *Digitalium fluidum*, and which from the experiments made with it on animals appears to be the real bearer of the physiological action of this plant.

This alkaloid is exceedingly volatile, of an oily consistence, an alkaline reaction, difficultly soluble in water, readily so in alcohol, little soluble in chloroform, and soluble in absolute ether. Its odor is very penetrating, intermediate between that of conia and nicotina: when diluted it is not so unpleasant, (Neues Jahrb. f. Pharm. Januar, 1863. xix. p. 29.) F. F. M.

NOTE ON THE ROOT BARK OF CINCHONA CALISAYA.

By John Eliot Howard, F. L. S.

In almost every recent importation of the finest Calisaya bark from Bolivia, I have noticed an unprecedented amount of admixture of the *root bark*, which is easily distinguished by its peculiar characteristics, shown by the specimen I have sent to the Society. The *curly* shape in which it is found would strike the eye of every observer. It is imported in serons, along with the best quality, but often distinguished from these by an X branded on the hide. It will probably find its way into consumption for the manufacture of decoctions and tinctures, as it is not likely to be taken, except at an extremely low price by the manufacturers of sulphate of quinine. I have selected a very favorable specimen for examination, which yielded me in hydrated alkaloids of the first rough precipitation, 10 parts in 1,000, but from this very low percentage a still further deduction must be made, as the purified alkaloids gave only 8·14 parts in 1,000. Of this not more than 3·06 parts were obtained as a crystalline salt of quinine, and the remainder consisted almost entirely of the quinidine of Pasteur (crystallizing as a hydriodate). The substitution which thus appears to have taken place in the descent of the sap to the roots of quinidine for quinine demands further investigation, and if confirmed by other observations is not a little curious. According to Gerhardt the atomic constitution of quinine is $C_{40}H_{24}N_2O_4 + n$ aq., and of quinidine (of Pasteur), $C_{40}H_{24}N_2O_4 + 4$ aq. One would be ready to belive in the conversion of one alkaloid into another in this case, were it not that the remarkably different and contrasted mode in which they respectively act on the ray of polarized light seems to indicate some more remarkable difference in the real structure than is manifested by ultimate analysis. It is certainly in the leaves that the first formation of the alkaloids takes place in the plant, and as some of the other constituents accompany the alkaloids unchanged (for example, kinate of lime and kinovic acid) through the whole course of the downward descent of the sap, it becomes an interesting inquiry whence so great a change as the substitution of one alkaloid for another could arise. The mother substance which is found in the heartwood of *Cinchona succirubra*, (as I have described under that head) is split into two or three substances in the bark, giving rise evidently to the cinchona red and also (as I think), under the influence of the *ammonia* which it is easy to detect in the external portions of the plant, to the formation of alkaloids. Patient investigation may hereafter lead to our ascertaining the mode of all these changes, which are at present sufficiently obscure.

In reference to the commercial value of the root bark of Calisaya, I have only to remark that the importers are greatly disappointed at the low estimation in which the article is held in Europe. The collectors in Bolivia had succeeded in passing this root-bark off as genuine Calisaya, which it (in one sense) undoubtedly is, and having hit upon the wasteful method of extirpating the finest species of Cinchona from the forests of Bolivia for the sake of a present profit, are now much annoyed to find that in "killing the goose which laid the golden egg" they have not even the consolation of selling the bird to advantage.—*Lond. Pharm. Jour. Feb.*, 1864.

ANTIDOTES FOR STRYCHNIA.

Professor R. Bellini, after conducting a long series of experiments on poisoning by strychnia and its salts, arrives at the opinion, that the best antidotes are tannic acid and tannin, chlorine and the tinctures of iodine and bromine. Chlorine, he maintains, attacks the strychnia even when it is diffused through the system, for he found that in rabbits poisoned with the sulphate of the alkaloid, on being made to inhale chlorine gas in quantity, such as was not sufficient in itself to kill, the convulsions were retarded, and were milder when they occurred; death also was less rapid. The author further observed, that when strychnia was exhibited with pyrogallic acid, the convulsion was retarded for the space of half an hour, by comparison with other experiments in which the alkaloid was given by itself. Professor Bellini believes that this arrest in symptoms is not dependent on the acid acting chemically on the strychnia, but only through the astringent effects produced by the acid on the mucous membrane of the stomach, whereby the absorption of the poison is rendered difficult. The same author, dwelling on the frog-test for strychnia, asserts that this test is not to be trusted, inasmuch as other poisons produce the tetanic symptoms, although in a lesser degree.—*Brit. Med. Jour.*

ON THE COMPARATIVE VALUES OF THE COMMERCIAL VARIETIES OF BUCHU LEAVES.

By P. W. Bedford.

"What are the actual values of the commercial varieties of Buchu Leaves, based on the proportion of volatile oil they will yield?"

There are found in commerce, three varieties of Buchu, known as long, medium, and short. Their monetary value is in the same order, the long Buchu (at the present time) being worth 80 cents per lb., while the short Buchu can be had for 30 cents. The second commercial variety, known as medium, has not been in the market in this city for several months. Owing to this fact, my experiments have been confined to the two varieties, long and short.

The long Buchu, known as Barosma serratifolia (Willdenow), is the variety most highly esteemed, but my experiments show that it contains much less volatile oil than the Barosma crenulata or short-leaved Buchu. These experiments have been made on quantities varying from 9000 to 15,000 grains of the leaves. My experiments with the long-leaved Buchu gave respectively 0·62, 0·68, 0·64, and 0·71 per cent., being an average of 0·66 or two-thirds of one per cent.

Similar experiments with the short-leaved Buchu gave respectively 1·60, 1·16, 1·07, and 1·02 per cent., being an average of 1·21, or one and one-fifth per cent.

The only recorded analyses of Buchu leaves I have met with are those of Brandes, made in 1827, and another made the same year by Cadet de Gassincourt.

Brandes' analysis sets the amount of volatile oil at 0·88 per cent., that of Cadet de Gassincourt at 0·665 per cent. The variety of Buchu is not stated.

In Stillé's Materia Medica and Therapeutics, vol. 2, p. 673, it is stated that Buchu yields seven per cent. of volatile oil, which statement is evidently an oversight or misprint.

New York, August, 1863.

Proc. Amer. Pharm. Association, 1863.

ON THE PRESERVATION OF VOLATILE OILS.

By Alfred B. Taylor.

While the importance and the difficulty of preserving the volatile oils from the deterioration to which they are all so prone are universally recognized by the pharmaceutist, the two great destructive agencies by which they are beset are so universally diffused, that there seems to be little that can be suggested beyond what is familiarly known, calculated to secure the great desideratum. So far as we are at present aware, the only decomposing influences to which they are usually exposed, and by which they are likely to be attacked, are atmospheric oxygen and light, (to which latter might be added its natural analogue—heat.)

Whether these agents are merely co-operative, or whether they are indpendent,—that is, whether heat and light merely present more favorable conditions, whereby the affinities of the air for the oils are enhanced and accelerated,—or whether they are capable of exerting their own specific action in disturbing the primitive structure of the oils themselves, has not been definitely established, and would require a course of tedious and difficult experiment certainly to determine.

Inasmuch as the bottles from which the apothecary must dispense these oils are necesarily uncovered very frequently, and exposed to the air almost constantly, it is evidently of the first importance that this evil should be reduced to a minimum by using bottles of the smallest practicable size, containing not more than the retail supply for a week or so, and that these should be very closely stopped; or, in others words, that the bulk of any one of the said oils in store should be distributed among a number of small receptacles, so that each one may be exposed to opening for but a short period, and at the same time may expose, within the receptacle, but a small surface, to a small volume of inclosed air. If this expedient of division were more generally resorted to, there can be no doubt that the apothecary would have the satisfaction generally of dispensing a much "fresher" article, and would in that satisfaction be fully compensated for the increased trouble or expense attendant on the multiplication of containing vessels, and their storage bulk. It would perhaps facilitate, and

Fig 1

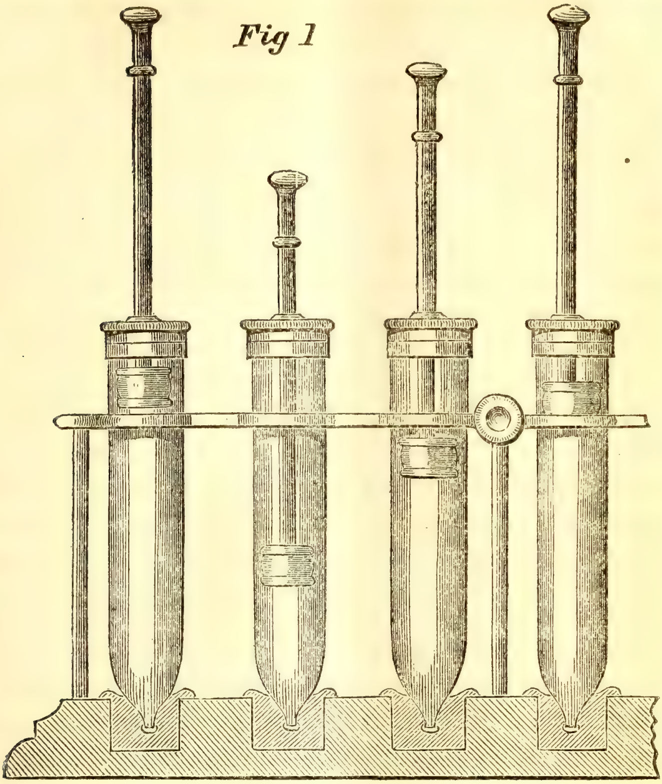


Fig. 2.

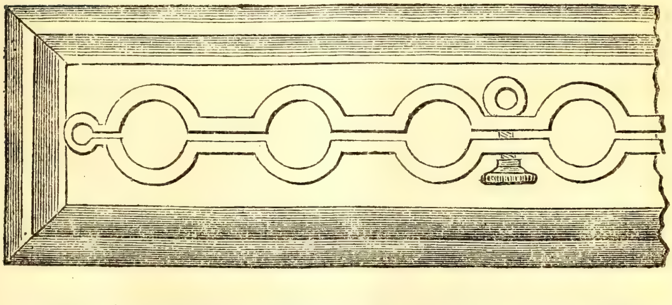


Fig. 1. VIEW OF SYRINGE BOTTLES IN POSITION, WITH THE BASE OR PEDESTAL SHOWN IN SECTION.

Fig. 2. TOP VIEW OF PEDESTAL AND SUPPORTING FRAME.

more certainly ensure, this desirable result, if the wholesale druggists, importer, or manufacturer, should originally put up the various oils in packages of bottles of small capacity, instead of those of larger bulk.

The only method that suggests itself of entirely excluding air from the dispensing vessel, would be to employ glass syringe bottles as the containing vessels; the points of the syringes to rest in conical seats of glass (forming the base or pedestal,) and to which they should be accurately fitted by grinding. By this arrangement, moreover, the first tendencies to form sediment would be checked or removed, by the lower portion of the oils being the earliest used. How far this device presents a practicable expedient, could perhaps be satisfactorily determined only by actual trial. It is hardly necessary to remark that, in any case, the bottles should be perfectly dry, as water appears to oxidise the oils quite as readily as air. An incidental advantage of the use of syringe bottles is the facility presented for graduation, whereby the quantity on hand is directly indicated, and the necessity of as intermediate measure entirely avoided.

In regard to the action of light, it has long been recognized that the volatile oils are much better preserved by being kept in a dark as well as in a cool place. As an obvious expedient, blackened or opaque bottles have been used, and with very decided advantage. One inconvenience, however, attending the use of non-transparent vessels, is the impossibility of observing the condition of the contained oil or other fluid,—a matter sometimes very desirable.

Inasmuch as the orange rays of light (or those of the least refrangible end of the solar spectrum,) have been found to exert no actinic action, it is thought that the employment of glass bottles of this color would present the desideratum of entirely protecting the oils from the chemical influence of light, and at the same time of allowing their amount and appearance to be distinctly perceived. Of course, all those preparations of the essential oils liable to change, such as orange-flower water, rose water, &c., would be equally well shielded, and would, indeed, be better preserved than by the means usually employed to exclude light. The means here suggested would be equally advantageous for the preservation of all those chemicals particularly prone to deterioration from exposure to light.

It will perhaps be considered unnecessary to advise that, (in the absence of bottles of the above description, all essential oils should be kept in a dark closet,—as it is only saying what everybody knows,—still, since everybody does not at all times practise what he knows to be best, it is earnestly recommended to every apothecary, who wishes to satisfy himself or his customers, to try the expedient, and he will be amply repaid for any trouble or inconvenience resulting therefrom.

Proc. Amer. Pharm. Association, 1863.

PREPARATION OF CHLOROPICRIN.

By Samuel Priestley.

This substancce, which has usually been prepared by distilling picric acid with hypochlorite of lime, may be prepared from methylic alchohol directly—a fact which establishes beyond doubt the connection of chloropicrin with the methyl series.

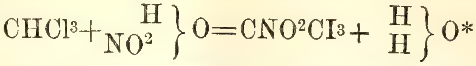
I succeeded in obtaining the substance in the following manner:—

Bleaching powder is introduced into a flask, with as much methylalchohol as will form a paste. After mixing the materials, the flask must be placed in a shallow basin of cold water, in order to prevent the volatilisation of the spirit by the heat disengaged.

When the chemical action has subsided, nitric acid is added carefully and by small portions at a time, allowing the action to subside each time, the flask remaining still in the water.

The whole, when dissolved, is submitted to distillation. During the distillation a gas is evolved, which burns with a green flame, and may be collected over water. It is probably chloride of methyl, but I have not examined it further. This product which collects in the receiver appears to be a mixture of chloroform, chloropicrin and wood-spirit. These substances are afterwards separated by distillation; the chloropicrin, having a higher boiling point, remains behind.

In actual reaction it is very probable that chloroform is first produced, and that the nitric acid reacts according to the following equation:—



$$CHCl^3 + \left.\begin{matrix}H\\NO^2\end{matrix}\right\}O = CNO^2Cl^3 + \left.\begin{matrix}H\\H\end{matrix}\right\}O^*$$

The odor and oily appearance of the substance leave no doubt as to its true chemical nature.—*Chem. News, London, Jan.* 2, 1864.

ON THE THERAPEUTICAL PROPERTIES OF SANGUINARINA, AND ITS ACETATE AND SULPHATE.

By Robert P. Thomas, M. D.,
Professor of Materia Medica in the Philadelphia College of Pharmacy.

Having been requested by the Association to prepare "an essay on the actual merits of Sanguinaria as a therapeutic agent based on trials with Sanguinarina and its salts, and its claims to a prominent position in the Materia Medica," I submit the following as the results of a large number of observations made by myself, or by other gentlemen at my request. Before stating my own experience, however, it is manifestly proper that a brief notice should be given of the recorded labors of others, in order that a just estimate may be formed of the true characters of this valuable drug.

In 1803, Dr. Wm. Downey, of Maryland, presented an inaugural thesis on the Blood-root, the root of which he designates as a powerful emetic in doses of twenty grains, causing much irritation of the fauces, then warmth in the stomach, increased force and frequency of the pulse, followed by nausea and vomiting. Two to four grains may occasion nausea. A small quantity snuffed up the nose produces violent irritation.

Dr. Smith, of Wilkesbarre, Penna., used for some years, with great success, the powdered root in jaundice. He administered it in doses of fifteen or twenty grains. (Philad. Med. Museum, vol. ii. p. 160, 1806).

In 1824, Dr. James F. Dana, of N. Y., discovered the active principle, and his assistant, Mr. Augustus A. Hayes, of Windsor, Vt., gave the following process for its preparation:

Thoroughly exhaust the contused root by successive macerations in water acidulated with sulphuric acid: filter, add water

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* Carbon = 12. Oxygen = 16.

of ammonia as long as a precipitate falls; decant and wash on a filter, first in water containing a little ammonia, and then in pure water, to get rid of the ammonia. Macerate the precipitate in alcohol, filter, distil off three-fourths of the alcohol, and pour the remainder into eight times its bulk of water. Collect and wash the precipitated sanguinarina.

The late Dr. William Tully carefully investigated the therapeutical properties of the blood-root. His first paper was published in the New England Jour. of Medicine and Surgery, vol. viii. p. 106, 1819. His second paper, or "Prize Essay," on the same subject, is an elaborate and exhaustive article, detailing the observations of himself and others on its effects in different diseases. (See Amer, Med. Recorder, vol. xiii. p. 23, 1828.)

In a third article, (see Boston Med. and Surg. Jour. p. 247, 1832), treating of the active principle, he says, that sanguinarina or its tartrate, given in large doses, causes vertigo, dilatation of the pupils, staring and protuberance of the eyes, a haggard expression, nausea, coldness of the extremities, cold sweats and diminution of the frequency and irregularity of the pulse.

Another ardent investigator of the properties of our indigenous plants, Dr. W. Zollickoffer, of Maryland, had his attention directed, about the same time as Dr. Tully, to the Sanguinaria Canadensis. He used a saturated tincture of the root as a tonic, in doses of eight or ten drops three times a day. In acute rheumatism he gave beneficially thirty drops of this tincture combined with eight drops of laudanum every three hours until nausea was induced. (Philad. Jour. of Medical and Physical Sciences, vol. vi. p. 295, 1823).

That it is poisonous in large doses is painfully proved by the following fact: In July, 1841, four persons, while engaged in cleaning the Apothecary Department of Bellevue Hospital, N. Y. found a demijohn containing the tincture, of which they drank freely, mistaking it for liquor. They were all seized with racking and burning pains in the mouth, throat, stomach and bowels, and a tormenting thirst. Having concealed from the physician what they had done, restorative measures were not resorted to until too late, and death ensued in each case on the following day. (Amer. Jour. of Med. Sci. p. 506, Oct., 1841.)

In consequence of its local action, bloodroot has been much employed as a resolvent. Thus, Dr. R. G. Jennings, of Va., asserts that a weak vinegar (℥½ macerated for a few hours in Oj. of vinegar) is superior to any gargle he has ever used in the sore throat of scarlet fever, especially when the larynx appears to be seriously implicated. (Stethoscope, vol. ii. p. 183, Richmond, 1852.)

Dr. Brice, of Newark, Ohio, reports three cases of nasal polypus cured by the direct application of bloodroot in powder and decoction. (West. Jour. of Med. and Surg. vol. ii. p. 237, Louisville, 1840).

Dr. Lewis Shanks also reports a case of the same disease cured by similar means. (Amer. Jour. Med. Sci. p. 368, Oct., 1842.)

As an emetic, Dr. Henry West thinks the bloodroot ranks intermediately between ipecacuanha and tartar emetic, being more nauseating than the former and less prostrating than the latter. He gives ten grains of the powder, or two fluidrachms of the tincture, every twenty minutes, until vomiting is produced. He considers it highly beneficial in croup and laryngismus stridulus. (Western Lancet, vol. xi. p. 441, 1850.)

Most of the writers already quoted, and many others that might be named, speak in terms of commendation of an alterative or deobstruent property of bloodroot, and therefore recommend its employment in jaundice. But they generally use it as an adjuvant rather than as the principle remedy. Dr. J. L. Mothershead, of Indianapolis, is an exception to this remark. He sums up ten years' experience by asserting strongly its alterative properties. In jaundice, after giving a portion or two of calomel, he exhibits from thirty to sixty drops of the tincture three times daily in compound syrup of sarsaparilla. In a few days the yellow tint leaves the skin. (N. West. Med. and Surg. Jour. p. 369, 1849.)

Another property of great value is thus described by Dr. Isaac Thorn, of Yellow Springs, Ohio, after a large experience with the drug. "It is a sedative of no ordinary powers. For reducing the force and frequency of the pulse at the same time without prostrating the system, it is one of our most efficient remedies. Its sedative effects are exerted slowly, not being perceived until after the medicine has been administered 24 to 48 hours, and then come on very gradually." (Western Jour. of Med. and Surg. p. 397, 1847.)

The foregoing extracts, illustrating the observation and experience of practical physicians whose attention had been directed to the plant under consideration, show conclusively that it is entitled to a more extended trial, with a view to determine "its claims to a prominent position in the Materia Medica."

In order to resolve the question referred to me, concerning the actual value of the alkaloid existing in bloodroot, and the salts formed from it, I obtained from Messrs. W. S. Merrill & Co., of Cincinnati, a portion of the sulphate of sanguinarina, and I had the pure alkaloid and the acetate prepared therefrom by Mr. W. R. Warner, of this city, whose well-known accuracy as a chemist is a sufficient guaranty of the genuineness and purity of the specimens subjected to therapeutical investigation.

Sanguinarina, as procured from the sulphate, is a yellowish-gray powder without odor, and almost without taste. A slight acrimonious impression is developed after a time upon the tongue from the partial solubility of the alkaloid in saliva. Snuffed into the nostrils it causes, after a few minutes, a burning sensation followed by sneezing. It is nearly insoluble in water, sparingly soluble in glycerin, and soluble in chloroform and ether, and in a large quantity of alcohol.

Sulphate of Sanguinarina is a granular powder, of a bright vermillion-red color, without odor, but having an extremely acrimonious taste. The acrimony is particularly manifested in the throat. It is freely soluble in water, soluble in glycerin, and in a large quantity of alcohol and syrup; but nearly insoluble in chloroform and ether. Ammonia precipitates it from a watery solution. The precipitate is not redissolved by an excess of ammonia.

Acetate of Sanguinarina is in dark brownish-red scales. It has no odor. The taste is less acrimonious and more slowly developed than with the sulphate. It is slightly soluble in water, ether, and alcohol, but freely soluble in chloroform.

Therapeutical experiments with Sanguinarina (*the pure alkaloid.*)

I. Being in good health and engaged in my usual avocation, I took one-twentieth of a grain of the alkaloid at 9 A.M., and at 1, 6, and 10 P.M., daily, for seven successive days. This experiment was instituted to ascertain the proper dose, as also the effects when continued for several days.

At the beginning of the experiment the pulse was 60, and continued about that rate for two days. Upon each of the five following days it stood at 60 in the morning, and at 52 or 53 in the evening. In health the pulse is usually rather more frequent in the afternoon, from exercise or labor. Here, however, the order was reversed. For in the afternoon, when affected by the remedy, the pulse fell to 53, but the influence of the sanguinarina being diminished or lost at night in the long interval from 10 P.M. to 9 A.M., the pulse rose to its ordinary rate in the morning.

The medicine was taken in the pill form. It occasioned no distress in the stomach, no action on the bowels (there having been but the usual daily evacuation), and no change in the character of the evacuation. The kidneys and skin were not influenced in any appreciable degree. There was no flow of saliva or uneasiness in the mouth, and there was no vomiting or even nausea for the first five days, but on the sixth and seventh days I was conscious of gastric discomfort.

II. In this experiment the quantity of the alkaloid was increased to one-tenth of a grain, which was taken four times a day for two successive days. The pulse at the commencement was 60, and at the close of the experiment it was reduced to 52. On the second day I experienced a feeling of warmth and uneasiness in the stomach about half an hour after each dose. I was not conscious of any other action on the system, excepting a slight sensation of fulness in the temples.

III. I administered to a girl, aged twelve, who had a hard, dry, racking cough, one-thirtieth of a grain every four hours for four days. Her usual pulse is 85. At the beginning of the experiment it was 104, and at the close of the fourth day it had fallen to 88. The cough in the meanwhile had become a little more loose, but, as the change was not very evident, I was obliged to discontinue the remedy to gratify the parents. The reduction of the pulse was the only apparent action of the medicine.

IV. One-fifth of a grain was administered to two patients every four hours for a day. Both patients complained of uneasiness in the stomach after the second dose, which increased to nausea after the third and fourth doses. In each case the pulse was reduced, but the reduction appeared to be owing quite as much to the nausea as to any positive sedative effect of the remedy upon the heart.

Experiments with the Sulphate of Sanguinarina.

Having obtained by the previous trials a knowledge of the proper quantity to be administered, I placed in the hands of Mr. B. L. Bird, one of the Resident Physicians of the Episcopal Hospital, some of the sulphate, which he gave to a number of the patients, carefully watching the results.

He exhibited the remedy in doses ranging from one-tenth to one-half of a grain every three hours. In no case had we reason to think that it acted on the bowels, kidneys, or skin.

When given in doses of one-tenth to one-sixth of a grain, nearly all of the patients could take it every three hours for one or two days without experiencing nausea or much gastric uneasiness; and in every case but two the pulse was reduced five to ten beats in the minute, after the patient had taken it 36 to 48 hours.

In one case, three doses of a quarter of a grain each were given at intervals of two hours. After each dose the patient experienced warmth in the stomach and nausea. The last dose was followed by vomiting. The reduction of a few beats in the pulse, in this case, was probably occasioned by the sickness of the stomach.

In another case a single dose of a quarter of a grain produced nausea and slight vomiting. Half a grain was administered to another patient as an emetic, and the dose was repeated in fifteen minutes. Prompt and free vomiting occurred soon after the second dose, without undue retching or distress.

The following is a convenient mode of exhibiting the sulphate in solution as an expectorant:

℞. Sanguinarinæ sulphatis, gr. j.:
Aquæ, fʒj.
Solve et adde
Syrupi, fʒxv.
M.
Signa. Dose, a teaspoonful.

Experiments with the Impure Acetate.

I determined to try the acetate in an impure form, for the purpose of ascertaining whether the other principles associated with the alkaloid in the plant modify to an appreciable extent its action on the system. To effect this object, four ounces of the contused root were macerated in a pint of diluted acetic acid, then placed in a percolator, and a pint of percolate drawn off. This preparation is so acrid to the taste that a fluidounce of syrup will scarcely obtund the acrimony of a fluidrachm. This circumstance, after a trial of the medicine in ten or twelve cases of chronic bronchitis, induced me to have the remedy prepared in a more palatable form, as follows:—

Syrup of Sanguinaria.

℞. Contused bloodroot, ℥ij.
Diluted acetic acid. Oj.
Sugar, lbs. ij.

Moisten the root with a portion of the acid, place in a percolator, add the remainder of the acid, exhaust by percolation, and to the clear liquid add the sugar, and dissolve by a gentle heat.

The strength of this preparation is one ounce to a pint of syrup, and the dose is a teaspoonful.

The syrup was extensively used at the Episcopal Hospital during last winter and spring, having been given in more than an hundred cases of diseases of the throat and lungs. It was generally administered in combination with an equal quantity of syrup of Tolu.

The results of the trials with the syrup may be briefly stated thus:—When given regularly at short intervals for three days or longer, the patient would speak of an uneasiness in the stomach, or nausea, and, as a consequence, of impaired appetite. The pulse remained at about its previous average, or was slightly diminished in frequency. The bowels were not relaxed, nor did constipation follow its employment.

The syrup is a good expectorant. During its use the patient could separate and raise the mucus with less difficulty, and the secretion of mucus appeared to be diminished.

The condition of the brain was carefully observed, but no evidences of a narcotic action were manifested. It is true that several of the patients slept better at night, but this seemed to be due more to the relief of the cough than to a specific narcotic action of the drug.

As the result of the various experiments above alluded to, and partly described, I think the following conclusions may be considered established, viz. :—That Sanguinaria and its salts, when given in doses ranging from one-twelfth to one-eighth of a grain, act as an expectorant, promoting the discharge of the mucus from the lungs without disordering the stomach to any considerable extent.

When given in quantities of one-sixth to one-fourth of a grain at intervals of two or three hours, most persons experience nausea after each dose, and some actually vomit.

If half a grain be given in solution every ten minutes, vomiting will almost certainly ensue after the second or third dose.

If the eighth or the sixth of a grain be given every three hours for two or more days, the pulse will generally be reduced from five to fifteen beats in a minute, thus showing a decided sedative impression on the heart, which impression, however, is slowly developed, and ceases soon after the medicine is discontinued. The reputed effects of bloodroot upon the liver, and as an alterative, have not been produced by sanguinarina or its salts upon myself or others subjected to experiment. The alkaloid sanguinarina is certainly the most valuable principle existing in the bloodroot, but I am persuaded it is not the sole agent, as some trials made with the impure resin show that the latter also possesses nauseant and emetic properties.

Proc. Am. Pharm. Assoc., 1864.

SOURCE OF SULPHUR.

Until within the last few years Sicilian sulphur was almost exclusively employed in this district for the manufacture of sulphuric acid—the pyrites from Wicklow being the only other source of supply. This latter, however, was not sufficiently abundant to render the manufacturer independent of the great fluctuations which have recently taken place in the price of sulphur, on account of the demand consequent on the vine disease. During the last few years the following additional sources of sup ply have become available:—1st, Belgian; 2d, Norwegian; 3d, Spanish or Portuguese; 4th, Italian; 5th, Westphalian pyrites. 1. The Belgian pyrites has the advantage of being shipped at Antwerp at a moderate freight to the Tyne. It is a very hard, compact material, containing about 50 per cent. of sulphur, and therefore nearly approaches a pure bi-sulphuret of iron. The burnt residue from one manufactory on the Tyne (the Walker Alkali Works), after being roasted in a lime-kiln to burn off the small remaining portion of sulphur, is regularly used as an iron ore at the adjoining iron works. It contains no copper, and from 3 to 5 per cent. of arsenic. 2. The Norwegian pyrites is shipped at Levanger. It contains 44 per cent. of sulphur, is easily broken, and does not readily flux in the kiln. The quantity of copper it contains being less than ten per cent., the burned residue cannot be profitably smelted for copper. 3. The most extensively used pyrites is shipped from Huelva, in Spain, and Pomeron, in Portugal. The mines are situated on each side of the boundary between the two countries. They were most extensively worked in ancient times, but their recent development has arisen from the use of the ore as a source of sulphur. Containing only two to four per cent. of copper, it was unable to compete with the richer ores which from time to time became available in different parts of the world, but the mining is now rendered profitable by the value of the sulphur being realisable as well as that of the copper. The percentage of sulphur varies from 46 to 50. The practical difficulty of burning this ore, namely, its great fusibility at the point where the combustion of the sulphur gives rise to considerable heat, has been overcome by the adoption of kilns, first used in Lancashire, in which the area of the surface is large in proportion to the weight of the charged pyrites. The use of cupreous pyrites has led to the introduction of the manufacture of copper on the Tyne, which will this year amount to between 700 and 800 tons. The ordinary process of smelting is employed, —but the moist method is also being tried, the advantage being that, by this method, all the ingredients of the mineral are utilised, the oxide of iron making an ore of similar quality to hematite. The smelting process, however, is still preferred in the large manufactories. In 1860 several cargoes of an ore containing free sulphur imbedded in gypsum were imported from the Island of Milo, in the Archipelago. From the small quantity of sulphur contained in it (19 up to 24 per cent.) there was great difficulty found in burning it, except the large masses. Subjoined is an analysis of one parcel of it:—Sulphur, 24·00; gypsum, 62·20; sand, &c., 6·00; water, 7·00. Still more recently, Professor Anstead has discovered a deposit of free sulphur in Corfu, of which he has been kind enough to forward a sample, but we believe it has not been used in commerce. When sulphuric acid is wanted quite free from arsenic, Sicilian sulphur must be used. So largely has pyrites displaced sulphur in the production of sulphuric acid, that in 1862 only 2030 tons of sulphur were consumed, against 72,800 tons of pyrites; and, reckoning the above quantity of sulphur as equivalent to 4500 tons, it appears that 77,300 tons of pyrites are annually used for the manufacture of sulphuric acid, along with 2500 tons of nitrate of soda. Assuming a produce of 120 per cent. on the pyrites, this is equal to a production of 92,760 tons of sulphuric acid, calculated as concentrated. This quantity of sulphuric acid is nearly all consumed where it is made, for the manufacture of other chemicals, such as soda and manures, the quantity sold being 64·40 tons; but this might be more correctly described as consumed in other works, for the quantity sent to a distance is very small. Four-fifths of the sulphuric acid is used for the decomposition of common salt. —*Chem. News*, *Sept.* 12, 1863.

NOTE ON THE GUM-RESIN OF THE BALSAM OF PERU TREE.

By Dr. Attfield.

The naturally-exuded resin of the *Myroxylon Pereiræ*, as furnished to me by Mr. Hanbury, consists of

	In 100 parts
Resin	77·4
Gum	17·1
Woody fibre	1·5
Water and a small quantity of volatile oil, about	4·0

The *resin* is an acid, its alcoholic solution feebly reddening litmus-paper, and is uncrystallizable. The *gum* is similar to that of gum arabic. The *volatile oil* is limpid, colorless and fragrant.

Submitted to destructive distillation the exudation yields an acid water, empyreumatic oils gradually darkening in color, and a pitchy residue which ultimately chars to a cinder. It contains no cinnamic acid.

This exudation is obviously therefore a gum-resin similar, for instance, to that of ammoniacum, and though found on the bark of the tree yielding the black fluid Balsam of Peru is apparently quite distinct from the latter substance, the one having no apparent relation to the other.—*Pharm. Journ.* Dec., 1863.

ON THE SOLUBILITY OF SOME THALLIUM SALTS.

By William Crookes, F. R. S.

The following table is the result of many careful experiments. The figures may be relied upon as accurate:—

One part of Thallium		Water at 60° F.		Boiling water.	
Protochloride	dissolves in	283·4	parts.	52·5	parts.
Sesquichloride	"	380·1	"	52·9	"
Iodide	"	4453·0	"	842·4	"
Plantinochloride	"	15585·0	"	1948·0	"
Sulphate	"	21·1	"	5·4	"
Nitrate	"	9·4	"	—	"
Carbonate	"	24·8	"	3·6	"
Oxalate	"	69·3	"	11·0	"
Binoxalate	"	18·7	"	—	"
Phosphate	"	201·2	"	149·0	"
Terchromate	"	2814·0	"	438·7	"

The nitrate and binoxalate dissolve in considerably less than their own bulk of boiling water, forming a syrupy solution.

The insolubility of the platinochloride is remarkable. It may be of interest to compare it with the corresponding potassium, ammonium, rubidium, and cæsium salts:—

One part of Plantinochloride of		Water at 60° F.		Boiling water.	
Potassium	dissolves in	108·	parts.	19·	parts.
Ammonium	"	150·	"	80·	"
Rubidium	"	740·	"	157·	"
Cæsium	"	1308·	"	261·	"
Thallium	"	15585·	"	1948·	"

Chem. News, Jan., 1864.

ON THE MANUFACTURE OF BALSAM OF PERU.

By Daniel Hanbury, F. L. S.*

It is now thirteen years since the late Dr. Pereira laid before the Pharmaceutical Society of Great Britain some account of the process by which the liquid known as *Balsam of Peru*, is prepared in the State of Salvador in Central America, and at the same time described, so far as the imperfect materials at his disposal would allow, the tree from which the Balsam is obtained. Subsequently to this, namely in the year 1860, Dr. Charles Dorat of Sonsonate in the State of Salvador communicated to the *American Journal of Pharmacy* a notice of the manufacture of Balsam of Peru completely confirmatory of that given by Dr. Pereira, which account was republished in the *Pharmaceutical Journal.*

The Balsam-tree, which Pereira at first regarded as *Myroxylon pubescens* HBK, was afterwards called by him provisionally (until materials for a complete botanical description should be obtained) the *Myrospermum of Sonsonate.* Upon the death of Pereira, the late Dr. Royle drew up in botanical terms a description of the tree, upon which he conferred the name of *Myrospermum Pereiræ*, which in 1857 was changed by Klotzsch of Berlin to *Myroxylon Pereiræ*, he maintaining the distinctness of the two genera *Myrospermum* and *Myroxylon*†.

The question of the origin of Balsam of Peru having been thus elucidated, there may seem little reason for again bringing it before the Society ; but having received within the last fortnight, through the kindness of Dr. C. Dorat, somewhat ampler information upon certain points, accompanied by some excellent original sketches representing the collection of the balsam at Juisnagua, near Sonsonate, I think the subject sufficiently interesting and important to deserve further attention. I am the more strongly of this opinion because I find that continental pharmacologists are by no means agreed as to the botanical origin and place of production of the balsam, or even as to the mode of its manufacture, one of the most recent wri-

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* Communicated by the author.—Ed. Am. Ph. Jour.

† *Bonplandia*, 15 Sept. 1857, p. 274.

ters describing it to be obtained by boiling the bark and branches, or else by destructive distillation like tar, and two others naming four species of *Myroxylon* as being probably employed to yield it.

Dr. Dorat, with whom I have interchanged letters occasionally for some years, and from whom I recently requested information upon certain points connected with the history of Balsam of Peru, thus replies to the inquiries contained in my last letter.

"As I presume that you are writing a description of the Balsam-tree, I send you by return steamer the required answers to your questions, together with a specimen of the naturally-exuded resin, and a few beetles which are invariably found under any part of the decayed bark of the *Myrospermum.** That no possible mistake might exist on my part, I rode to Juisnagua, it being still the collecting season, and took a sketch of the process, which, with a verbal description. will, I trust make all clear to you.

Now to answer your questions:—as to the *natural* or *spontaneous exudation.* In young trees, say, until the sixth or eighth year I have never seen any. After that age a greenish resin is frequently found during the summer months on the northern side of the trees when they are at rest, that is from December to May. It is at first frothy and of a pale yellow color, but as it becomes hard it changes to green. It occurs in small quantities and is difficult to get clean, as it is very sticky. It has a slightly bitter taste, but no aroma. The Indians consider that the trees which produce much of it yield an inferior balsam. This, however, is only one of their many superstitions concerning these trees. The largest quantity I have myself seen was upon a very old tree ; it appeared in large tears lying one over the other, almost like grapes.

Early in the months of November or December, or after the last rains, the balsam-trees are beaten on four sides of their stems with the back of an axe, a hammer, or other blunt instrument until the bark is loosened, four intermediate strips being left untouched that the tree may not be injured for the next year. Five or six days after, men with resinous torches, or bundles of lighted wood apply heat to the beaten bark, which becomes charred. It is left eight days, during which the burnt pieces of bark either fall or are taken off. As soon as they perceive that the bare places are moist with the exuding balsam, which takes place in a few days, pieces of rag (of any kind of color) are placed so as entirely to cover the bare wood. As these become saturated with the balsam, which is of a light yellowish color, they are collected and thrown into an earthenware

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* Mr. Francis Walker, who has been good enough to examine this insect, considers it identical with the *Passalus interstitialis* of Percheron.

boiler, three-quarters filled with water, and stirred and boiled gently until the rags appear nearly clean, and the now dark and heavy balsam sinks to the bottom. Fresh rags belonging to the same owner are continually being put into the boiler until sun-down, when the fire is extinguished; when cold the water in the boiler is poured off, and the impure balsam set aside. During this process the rags that appear to have been cleared of balsam are taken out of the boiler at different times and given to a man to be pressed, by which means much balsam is still obtained. The press consists of a small open bag about fourteen inches long, made of stout rope fixed together with twine, open at the middle and looped at both ends to receive two sticks. The rags are placed inside, and the whole is twisted round by means of the sticks and the balsam thus squeezed out. A washer-woman wringing out a wet cloth, fairly represents the process. The balsam thus procured is added to that in the boiler. The next day, the cold balsam is weighed and put into *tecomates* or gourds of different sizes and sent to market:—its price at present is 5 reals per pound. If it is wished to purify it, the boiler is left standing for several days, when the impurities float to the surface and are skimmed off. A little water is also left to float at the mouth of the tecomate when brought for sale. These *tecomates* are tied up in plantain leaves, with a stopper of the same.

A very fine quality of balsam is collected from the broken pods in the same manner as above.* It requires more trouble and care to collect, and there being no demand for it, it is scarcely ever met with. I believe it is known as *Balsamo blanco.* From the flowers there is distilled a most delicious and fragrant *aguardiente*, far superior to any brandy.

A healthy tree will produce balsam well for about thirty years, after which, if allowed to remain untouched for five or six years, it will again produce. The collecting begins shortly after the last rains, that is, some time in November, and is supposed to be finished in May. During the rains none is collected. In the dog-days, that is from the 15 July to the 15 August, there being scarcely any rain here, a small quantity is collected by a few enterprising Indians.

The beating, and application of rags is only made during four days of each week, that is four *cosechas* (harvests) per month. Should the flow of resin decrease, fresh heating and rags are applied, and after eight days the boiling is resumed, and so on as long as the dry season permits. It was formerly the practice to apply fire to cuts made in the bark and to allow the exuding resin to burn for a short time: now after a good beating the bark is only heated by torches or burning wood.

I believe I mentioned to you that before the conquest and for a short time after, balsam formed a part of the tribute paid to the chiefs of Cus

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* It is more probably made by simple expression, and not by boiling.—D. H.

catlan, the chief department of the State (now S. Salvador), and was brought from the coast in earthenware jars representing the *pajuil* or Mexican pheasant (*Crax globicera*). Many of these old jars are now found in the mounds and excavations of the ancient *pueblos* on the coast. I send you a copy of a broken one in the possession of our worthy Bishop. It is one-fourth the original size. The *pajuil* feeds on the young nuts; and is found in great numbers on these trees during the season.

The small *pueblos* scattered over the so-called *Balsam Coast* are numerous. The principal ones are:—

Juisnagua, a moderate-sized pueblo, about six leagues from Sonsonate, formerly rich in cacao, but at present of small account. It is the first town where balsam is produced ; there are in the vicinity about 400 balsam-trees.

Tepecoyo, or Coyo, (Indian *Mount of Wolves*), on an elevated ridge, the valleys on either side being well watered, is situated twelve leagues S. E. of Sonsonate. About a league south of the town their is a gold mine, which was opened in 1832, and the ore sold in Guatemala. Owing to the depravity of the Spanish miners, the Indians rose against the owner and expelled him, since which they will not allow any one even to visit it. The produce of this pueblo in balsam is small, having been last year only sixty arobas of twenty-five pounds.

Tàmanique, situated in a circular valley, surrounded by very high and heavily timbered mountains, among which are numerous tigers, wild hogs, lions (puma), and four-fingered green monkeys. Vanilla is plentiful, but not of the finest quality. There are at present worked 1400 balsam-trees, producing about 160 arobas yearly. In the vicinity are 1500 cacao-trees of fine quality producing seventy arobas of cacao-beans. The Indians are a drunken and superstitious race.

Chiltiuapan, near the sea, on an elevated and extensive plateau, between two rivers, the Sonto and Sonsapuapa, running to the sea, with fine fish, and numerous caymans. The dense forests surrounding this pretty pueblo, contain 2569 balsam-trees, producing 450 arobas of balsam, value about $3500. The next article of value is cacao, of which there are 1700 trees, value of produce this year $830. The Indians of this pueblo are honest and very industrious, as besides the balsam and cacao they have now coffee plantations, and grow much Indian corn. The dress of the women consists only of a small petticoat, crimson, with a black stripe. They speak the Nahuat idiom.

Talnique, at the foot of the Cerro del Tamagas, or Snake-hill, situated on a most extensive and fertile plain, six leagues from Sonsonate, S. E. There are not above 500 balsam-trees about this pueblo. It is more noted for its fine qualities of timber, vanilla and cacao. It is from this vicinity that the best *mora* (fustic) is obtained, and also the finest grained rosewood (Grenadilla). The streams, of which there are several, abound in leeches, which are often sold in Sonsonate at four reals each. The Indians being in constant communication with Sonsonate are a vicious and lazy race. As in most of these pueblos, the wild animals commit great ravages among the cattle.

Jicalapa, situated on a small plain, about three leagues from the beach, intersected by deep gulleys, (*barrancas*), heavily wooded, principally with large cedars. The Indians are an idle race, and only cultivate about 1200 balsam-trees although many more exist in the dense woods, which remain uncleared. The heat is very great, and the climate most unhealthy. Maize is mostly cultivated, and plantains are numerous. The animals are tigers, pumas, warris, ant-eaters (two varieties), armadilloes and large black monkeys, which form a great portion of Indian delicacies.

Teotepeque, a small pueblo, situated on a beautiful eminence sixteen leagues from Sonsonate and one league from the sea. The climate is very hot, often 105° F. in the shade, but from its elevation very healthy. The men wear a scanty breech cloth, and the women only an apology for a petticoat. They are the most debased of all the Indians of the coast, plant a little corn and live principally on fish and every kind of animal, including their favorite dish the Iguana. There are plenty of balsam trees on the slopes of the mountains, but not above 300 are worked. They sell their balsam to the neighboring pueblos in exchange for *manta*. The hills also produce sarsaparilla, and several gums, incense, etc.

Comasagua.—This town, although producing a little balsam, does not belong really to the balsam coast, being nearer San Vicente. There are about 1000 trees, but their cultivation has been nearly abandoned for that of coffee, the climate being cool and appropriate to that plant. The balsam is sold in San Salvador. They have vanilla, maize, wheat, rice, potatoes, peaches, and a variety of fruit to supply the market of San Salvador. The inhabitants are mostly Ladinos, very steady, brave, and industrious. The dress of the women changes here to red and blue checkered.

Jayaque.—This town, which from records has existed for 260 years, is situated on the fertile declivity of a mountain called La Cumbre, a few leagues from Izalco, and near the hot river Cachal. There are about 1000 balsam-trees under cultivation. Sugar, however, is the principal branch of industry, value this year in *panela* or moist sugar $4000. The forests abound in fine woods, mahogany, cedar, rosewood, fustic and laurel, copalchi and a few quina trees, with sarsaparilla. About the year 1780, this town, then very large, was nearly destroyed by a flood of liquid mud, that issued suddenly from a small hill opposite ; a great portion of the inhabitants fled to the upper lands, and settled the present pueblo of Ateos, on the main road to San Salvador. The whole of these lands are volcanic, and form part of the volcanic group of Santa Ana and Izalco.

These are the principal towns trading in balsam, there are, however, many small villages and *chacras* or farms, having trees and working them, with whose names I have not become acquainted. The Indian name of he balsam is *Hoo shi-it*, or *Oo sheet;* in Spanish it is called *Balsamo negro*."

In addition to the sketches here referred to, and which are reproduced in the wood-cuts of this paper, Dr. Dorat has favored me with specimens of the Balsam-tree, *Myroxylon Pereiræ* Kl.; and as I have also received it from three other independent collectors, I do not feel the least hesitation in regarding it as the source of the whole of the Balsam of Peru of commerce. Dr. Dorat is himself of this opinion; and the late Mr. Sutton Hayes who was an excellent botanical observer, and who gathered specimens of the tree at Cuisnagua and in other places, assured me that so far as he knew, no other species of *Myroxylon* occurs on the Balsam Coast or in Guatemala.

Although there is some evidence to show that the balsamic exudations of one or two other species of *Myroxylon* or *Myrospermum* were formerly collected in other parts of tropical America and sent to Europe as *Balsam of Peru*, it is hardly on that account the less certain that for nearly three centuries the great bulk of the drug imported has had the same origin as that of the present day. At the period of the Spanish conquest, the balsam was an important production of the very region where it is still obtained, as is evidenced by it forming part of the tribute carried by the aborigines of the coast to the chiefs in the interior. It appears moreover, that the estimation in which it was held by the Indians was soon shared by their invaders; for in consequence of the representations of missionary ecclesiastics, Pope Pius V. was induced to issue a bill under date 1571, authorizing the use of the balsam produced in the country for the preparation of the Holy Chrism of the Roman Catholic Church. A copy of this curious document is still preserved among the archive of Guatemala (of which state Salvador was formerly a part), as well as in the Vatican at Rome.* Father Joseph de Acosta in his *Historia Natural y Moral de las Indias*, published at Seville in 1590, after referring to this fact, remarks that balsam is brought from New Spain and the provinces of Guatemala and Chiapas and others in those parts where

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* *Vide* also *Pharm. Journ. and Trans.*, vol. ii. (1861) p. 446.

it most abounds, but that the balsam which is most prized, is that of Tolu.*

As to the balsam having acquired the name of Peru, a country so remote from its place of production, the circumstance is intelligible when we know that during the early period of the Spanish dominion, the productions of Central America were shipped to Calao, the port of Lima, the capital of Peru, and great emporium of its trade, and thence transmitted to Spain. From this cause the drug acquired the name of the country from which it was shipped to Europe, exactly in the same manner as *Turkey* Gum Arabic, *Turkey* Myrrh, *East India* Rhubarb, *Bombay* Senna, etc. having acquired and still bear designations very little indicative of their real origin. In proof of this I may quote an interesting passage occurring in De la Martinière's *Dictionnaire Géographique* (Paris, 1768), where under the head *Callao*, the author enumerating its imports, mentions as coming fron Sonsonate, Realejo and Guatemala, the *Balsam which bears the name of Peru*, but which, says he, *comes in reality almost entirely from Guatemala.* He adds that there are two kinds of it, the *white* and the *brown*, the latter being the most esteemed.†—*Lond. Pharm. Jour.*, *Dec.*, 1863.

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* . . . . Lo que mas importa es, que para la substancia de hazer Chrisma, que tan necessario es en la sancta Iglesia, y de tanta veneracion, ha declarado la Sede Apostolica, que con este Balsamo de Indias se haga Chrisma en Indias, y con el se de el Sacramento de Confirmacion, y los de mas, donde la Iglesia lo usa. Traese a España el Balsamo de la neuva España, y la provincia de Guatimala, y de Chiapa, y otras por alli es donde mas abunda, aunque el mas preciado es, el que viene de la Isla de Tolu, que es en Tierrafirme no lexos de Cartagena."—lib. iv. c. 28.

† " . . . Dans la même rue du côté du nord, sont les magasins des merchandises que les vaisseaux Espagnols apportent du Chili, du Pèrou et du Mexique.

Du Chili viennent les cordages, les cuirs, les suifs . .

Du Mexique, comme de *Sonsonate, Realejo, Guatemala*, de la bray et du gaudron qui n'est bon que pour le bois, parce qu'il brûle les cordages; des bois pour les teintures, du souffre et du baume qui porte le nom de Pérou, mais qui vient effectivement presque tout de Guatemala. Il y en a de deux sortes, de blanc et de brun ; ce dernier est plus estime; on le met dans des cocos quand il a la consistance de la bray, mais communément il vient dans des pots de terre en liqueur, alors il est sujet à êtré falsifié et mêlé d'huile pour en augmenter la quantité."—De la Martinière, *Dictionnaire Géographique*, (Paris, 1758, fol.) Tome 2, p. 48.

WOOD SPIRIT AND ITS DETECTION.

By Emerson J. Reynolds.

(*Read before the Royal Dublin Society.*)

The products of the destructive distillation of various vegetable matters, in addition to those of primitive organic origin, have received more than ordinary attention and careful study at the hands of the chemist within the last ten or twelve years. Numerous highly complex acids, neutral substances, and bases, have rewarded the time and labor expended on their investigation, by the acquirement of both fame and riches for the discoverer—fame, owing to the great scientific value of the results, and riches in consequence of their practical application. The number and complexity of the compounds formed during the destructive process cease to surprise us, when we consider the ever-changing circumstances under which they are produced. To take an instance intimately connected with the subject of the present paper; let us suppose a block of wood placed in a close cylinder, and submitted to a gradually increasing temperature. The essential constituents of this block are carbon, hydrogen, oxygen, and nitrogen, all in different states of combination both on the surface and in the interior of the mass. On the first application of heat, the strictly organic structures are broken up superficially, their elements entering into new combinations, in which state they are volatilized. On the still further increase of temperature, the next succeeding layers undergo a similar process; but now, owing to the alteration of temperature, and probably in consequence of the different proportions and arrangements of the proximate constituents, another set of affinities come into play: the result of this is, as might be anticipated, the production of many new compounds, materially different from those preceding them. Thus the process continues, the products altering in character as the temperature fluctuates. Such being the case, it ceases to be a matter of wonder that the compounds formed should be both numerous and variable, or that the examination of these should open an almost inexhaustible field of research to the scientific explorer.

My object in laying the present communication before the

Society is to bring forward a new and reliable test for the detection of pyroxylic spirit, and likewise to give a brief preliminary notice of some experimental results which I have obtained in the course of an investigation undertaken with a view to the complete separation of the more volatile constituents of wood naphtha.

As pyroxylic spirit in its purest commercial form has been the subject of most of my experiments, it may be interesting to describe briefly the process by which it is manufactured on the large scale.

When wood is distilled in close vessels, and at high temperature, it yields a variety of products, which may be classed under three heads—solid, liquid, and gaseous. The solid and gaseous products, not being connected with our present subject, may be dismissed without further comment, our attention being solely confined to the liquid portions. The tarry mixture which is the result of the first operation is rectified, and the more volatile portions redistilled from lime or chalk, by which means the acetic acid, which is present in large quantity in the crude liquor, is got rid of. The distillate then constitutes the rough wood-naphtha of commerce. When required for medicinal use, this is further purified as follows ;—The crude material is largely diluted with water, by which means the oily hydrocarbons always present are precipitated, the last trace of these being afterwards removed by the action of oxidizing agents. The very weak methylic spirit thus produced is then frequently rectified *per se*, and finally over quick-lime until the specific gravity is reduced to about 800. It then constitutes medicinal naphtha.

The spirituous liquid thus produced is far from pure, since it consists of a mixture of acetate methyl, of acetone, methylic alcohol, and other bodies, which have been as yet but very imperfectly examined. Were we to attempt to separate these impurities by fractional distillation alone, failure could only attend our efforts, as a comparison of the boiling points of the three bodies already mentioned will show.

Acetate of methyl	boils at	133° F.
Acetone	" "	133° F.
Methylic alcohol	"	149° F.

The separation of methylic alcohol can be easily effected by means of chloride of calcium, but other methods must be adopted for the purpose of investigating the remaining constituents of the spirit.

When studying the deportment of various metallic salts with the purified naphtha, I observed the following reaction :—When a little solution of chloride of mercury was mixed with a few drops of the spirit, and then excess of potash added, the oxide of mercury first thrown down was speedily redissolved with the production of a clear solution. This result can be obtained in the cold, but it is more rapidly brought about by the aid of a gentle heat. When acetic acid was added to the alkaline solution a yellowish-white gelatinous precipitate was formed, but slightly soluble in dilute acetic, nitric, or sulphuric acids, though readily dissolved by hydrochloric, which appeared at the same time to decompose it. The deportment of this precipitate, on the application of heat, when taken in connection with other considerations hereafter to be mentioned, necessarily led me to conclude that I had obtained a definite compound of mercury with one of the constituents of pyroxylic spirit.

A considerable quantity of the naphtha was now submitted to careful distillation, and the portions which came over up to and at 176° F. were collected. After remaining steady at this temperature for some time, the boiling point rapidly rose to 182° F., and this distillate was likewise collected apart from the rest. On testing the two portions with chloride of mercury and potash, as before described, the first distillate gave the reaction very strongly, and the second not at all. The more volatile liquid was now rectified repeatedly from lime, and afterwards saturated with chloride of calcium. The impurities were then distilled off with the aid of a water-bath ; and the liquid which collected in the receiver, when tested as before, exhibited the reaction remarkably well. The results of these experiments indicate, in the first instance, that pure methylic alcohol is not connected with the production of the mercurial compound ; and, secondly, that the body whose presence is essential to the resolution of the oxide of mercury has a low boiling-point.

From this time I commenced the investigation of the mercurial compound, and have since succeeded in tracing it to its origin, and making out its history to some extent, as well as its more important chemical relations. As this is a matter not essentially connected with the practical application of the test, I will reserve it for the subject of a future communication, merely stating here, that *acetone* is principally concerned in the production of the reaction already described.

I will now give the results of some experiments with the mercurial solution above referred to, which may serve to illustrate its more distinctive characters; I will then pass on to the description of a method for the detection of "methylated spirits."

EXPERIMENTS WITH MERCURIAL SOLUTION.—A portion of the liquid was evaporated *in vacuo;* after a few days, it had solidified to a firm, opaque jelly; after a little time longer, crystals commenced to sprout out from the edges, and continued increasing daily, until what was formerly a jelly had become covered with beautifully formed acicular crystals, many of the delicate reed-like tufts reaching far above the edges of the capsule, and growing as it were, out of a resinoid amorphous mass. Analysis proved that these crystals consisted merely of chloride of potassium, the difference in crystalline form from that usually observed being due, as is well known, to the modifying influence of organic matter. The gummy residue remaining in the capsule after separating the crystals was then examined with a microscope, and found to be totally destitute of crystalline structure, the detached pieces being smooth and rounded, very brittle, and semi transparent. When heated to a temperature of about 450° F., it swelled up considerably, at the same time evolving a quantity of mercurial and empyreumatic vapor, and leaving a voluminous residue of carbon. When the original solution was boiled violently, a white gelatinous precipitate was formed, readily soluble in dilute hydrochloric acid, though apparently but slightly acted on by the dilute acetic, nitric, or sulphuric acids.

Excess of acetic acid was now added to another portion of the alkaline solution, and the resulting precipitate thoroughly washed, and then transferred to a retort; some hydrochloric acid was now added, and the mixture distilled. The distillate, when tested with chloride of mercury and potash in the usual manner, gave the reaction very strongly. Some solution of chloride of mercury and a few drops of the naphtha were mixed, and then excess of potash added, which caused the resolution of the oxide of mercury without the aid of heat. A portion of this solution, on the cautious addition of an acid, did not give any precipitate. The mixture was now gently warmed, and afterwards acetic acid added, upon which a precipitate was immediately formed.

From the results of these experiments, the following information may be gleaned:—1st. That the compound in question is somewhat resinoid in character and destitute of crystalline structure; 2ndly. It is precipitated by boiling, or on the addition of an acid; 3rdly. It is easily decomposed by hydrochloric acid, the organic body passing off unchanged; and 4thly. It is always necessary to employ heat previous to the addition of an acid, otherwise no precipitate will be produced immediately. A consideration of the first of these points, viz., the want of crystalline structure, the gelatinous appearance, and, in fact, the *colloidal* nature of the compound in question, led me to resort to the beautiful principle of "dialysis," as a means of freeing its solution from all saline impurities. In order to put this idea to the test of experiment, some of the mercurial solution was placed on a dialyser, floating on a considerable bulk of distilled water. After twenty-four hours, the diffusate contained a large quantity of chlorine, and but a very small proportion of mercury. The diffusion was then allowed to continue for eight days, during which time the water was changed twice a day. On the ninth day a mere trace of chlorine could be detected in the diffusate, and but little mercury. The liquid on the dialyser was almost odorless and colorless, and of high specific gravity; it was neutral to test-papers, and gave a copious precipitate both on boiling and the addition of acetic acid, thus demonstrating that the original compound was still present in the solution, apparently unchanged.

In my subsequent experiments I have found this method of separation most valuable, since it enables me to easily purify the colloidal mercurial compound from the crystalloids which accompany it in solution. The recapitulation of these, my earliest experiments, is sufficient to show the more important relations of this peculiar compound, and likewise enables me to point out how this particular reaction may be made available for the detection of "methylated spirits."

Detection of Wood Spirit.—It is a well-known fact that the liquid sold under the name of "methylated spirits" is a mixture of ten per cent. wood-naphtha, and ninety of spirit of wine. The addition of the former communicates a very disagreeable taste and odor to the latter, thus rendering it unpotable, and, it is said, unfit for internal use. This mixed spirit, though easily recognized by its odor when alone, yet, if used in the preparation of many strong-smelling tinctures or essences, cannot be thus detected, and we are then obliged to resort to chemical means to aid us in the discovery of the adulteration. Up to the present time, but one test has been proposed for the detection of wood-spirit; this is generally known as "Ure's test," having been first mentioned by the eminent chemist of that name. This test simply consists in adding powdered hydrate of potash to the suspected liquid; if wood-spirit be present, the mixture becomes brown in about half an hour. That this is a simple, easy, and correct test when the spirit is unmixed with vegetable principles, I do not deny; but there is one serious source of error, which, I think, prevents it from being generally applicable to the detection of wood-spirit in alcoholic tinctures, and this I will now endeavor to make evident. In commencing the examination of a sample of any tincture, it is, of course, necessary to distil it, and apply the test to the distillate. We all know that most tinctures contain some volatile principles extracted from the plants used in their preparation; when these are distilled, the volatile oil, though generally of a high boiling-point, is dissolved in the vapor of the spirit, and thus contaminates even the first portions of the distillate. If to this we add caustic potash in powder, in many cases the liquid will assume a brown tint, even though wood-spirit is not present, owing to the well-known action of the alkali on many essential oils—thus indicating an adulteration which did not really exist.

The method which I adopt in testing for wood-spirit is as follows:—A small quantity of the suspected spirit is placed in a tube retort, and distilled over into a cooled test-tube; two or three drops of a very dilute solution of chloride of mercury are now added to the distillate, and then excess of solution of caustic potash, and the whole well shaken. If the precipitated oxide of mercury does not redissolve even on warming the liquid, wood spirit is not present; should complete solution be effected, however, the mixture is warmed, and divided into two portions; to one acetic acid is added, which causes the formation of a yellowish-white bulky precipitate; the remaining portion is boiled, and a similar precipitate is thrown down, thus proving with certainty that wood naphtha is present. In applying this test, it is necessary to be careful not to add too much of the mercurial solution, as in that case an insoluble compound would be formed, and, as a consequence, a negative result arrived at.* When practised as I have now described, I look upon this test as being safe and reliable; at least, so far as my experience with it goes, I have always found its indications to be correct, and not liable to the ambiguity occasionally occurring with the potash test. I make this statement not on merely theoretical grounds, but from information gleaned in the course of a series of comparative experiments with pure tinctures, and those purposely adulterated with wood spirit. I trust that this reaction may prove useful as a means for the detection of an adulteration which, I am sorry to say, numerous analyses have shown me is practised to some extent in this city.†—*Lond. Pharm. Journ., Dec.*, 1863.

ON THE PREPARATION OF BITTER ALMOND WATER.

The preparation of bitter almond water of a uniform strength is a matter of some importance. A number of lamentable accidents, caused by the variation and uncertainty of the strength of this preparation, has caused a useful and agreeable medicine to be almost entirely disused in this country. Many accidents

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* It must not be forgotten that oxide of mercury is soluble to a slight extent in potash; but such a solution would not yield a precipitate on boiling, or on the addition of an acid.

† I may mention that "cleaned spirit" is capable of reacting with the mercurial salt in a manner precisely similar to the ordinary "methylated spirit."

have also occurred in France, where it is still largely prescribed, and the preparation of a water of uniform strength has been made the subject of some investigations by MM. Hepp and Schlagdenhauffen.* The experiments of M. Hepp have proved that a water of a constant strength, containing 1 per cent. of Majendie's hydrocyanic acid,† is obtained when from a given weight of bitter almonds an equal weight of water is distilled. Out of fifty-two estimations forty-seven gave exactly 1 per cent. of the acid, or very near to it.

In order to obtain the whole of the hydrocyanic acid which bitter almonds are capable of furnishing, it is important to facilitate the solution of the amygdalin, and submit it to the action of the emulsine under conditions the most favorable to the fermentation. The proportion of water necessary to promote the action of the emulsine on the amygdalin is not less than ten times the weight of the almonds employed. The almonds deprived of their fatty oil must be finely powdered, and allowed to ferment for three days, before the mixture is submitted to distillation. Three days are necessary for the production of the whole of the hydrocyanic acid, and the hydruret of benzule which accompanies it after three days.

M. Schlagdenhauffen has assured himself by experiment that no more hydrocyanic acid is produced, but beyond this lapse of time a period arrives when the amount of acid begins to diminish.

The still employed must be furnished with a false bottom perforated, and should not be more than half filled. The heat must be applied very gradually. Any amygdalin which may have escaped the action of the emulsine during the maceration will now be acted on, and after the distillation it will be found that the residue has been deprived of all bitterness, and will give no more hydrocyanic acid by the addition of an emulsion of sweet almonds.

After ebullition has commenced, the fire may be quickened and the distillation hastened, taking care, however, to cool the worm well, and collect the product in a vessel carefully joined to the end of the worm.

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* Reportoire de Chemie Pure et Appliquee, October, 1863, p. 379.

† Majendie's acid, we believe, contains 4 per cent. of real acid.—Ed. C. N.

The work from which the foregoing is quoted contains some statements of much importance. Among other things the author alleges that the amount of hydrocyanic acid is larger when the water is prepared with a hard well water than when distilled water is employed.—*Chem. News,* Nov. 14, 1863.

NOTE ON VEGETABLE IVORY.

By Dr. Phipson, F. C. S., &c.

Vegetable ivory is the fruit of *Phytelephas macrocarpa*, a plant allied to the palm-trees, common in South America. At the period of maturity the grain forms a hard mass resembling ivory or bone, which is manufactured into various kinds of ornaments. According to an analysis by Mulder, its composition may be represented by—

$$C_{12}H_{21}O_{21} = {}_2C_{12}H_{10}O_{10} + HO;$$

Baumhauer obtained a precisely similar result some years later.

I have found that vegetable ivory takes, in contact with concentrated sulphuric acid, a splendid red color, almost equal to magenta. This color, at first pink, then bright red, becomes much deeper and more purple when the acid has been allowed to act for about twelve hours.

This reaction may sometimes be found useful in order to distinguish small pieces of vegetable ivory from the ivory of the elephant's tusk, or from bone, neither of which take this beautiful red color in contact with sulphuric acid.

The analyses quoted above show that the greater portion of vegetable ivory is pure cellulose, but the reaction produced by sulphuric acid proves that other substances are present, for cellulose does not become red with sulphuric acid. Mr. Connel found in 1845 that vegetable ivory contained 81·34 per cent. of cellulose, and that the other substances were gum 6·73, legumine 3·80, albumine 0·42 (that is 4·22 of albuminous substances), oil 0·73, water 9·37, and ash 0·61 = 100. Filings of vegetable ivory dried at 140° to 150° C. give 1 per cent. of ash.

Payen found that these filings when boiled with caustic soda took a yellow color, a fact confirmed by Baumhauer, who asserts that potash does not produce any color.

The reaction of sulphuric acid on vegetable ivory has enabled me more than once to distinguish immediately between filings of this substance, and bone or ivory filings. It is owing to the well-known action of this acid upon albuminous substances in presence of sugar, and which has been utilised by Raspail in his microscopic researches. But whether the sugar is formed by the action of the acid in the cellulose, or pre-exists already formed in the substance is of little import. I incline, however, to the first opinion, as the color takes a little time to show itself (five or ten minutes), and as Mr. Connel did not find any sugar ready formed.

I have since observed that the white portion of the cocoa-nut presents a similar reaction with sulphuric acid; the color produced is first pink, then red, reddish purple, and finally, in about sixteen hours, a fine violet.

The colors thus produced with vegetable ivory and cocoa-nut disappear gradually in contact with water; like the fine reddish-brown color produced with essence of turpentine and sulphuric acid.—*Chem. News*, Nov. 14, 1863.

UPON THE ADMINISTRATION OF BISMUTH IN THE SOLUBLE FORM.

By Charles R. C. Tichborne, F. C. S.

Under the name of Liq. Bismuthi there has been introduced to the notice of the Faculty a preparation, which purports to possess great advantages over the ordinary basic nitrate. The desirable points in this preparation are—first, its solubility; second, its slight taste; and third, its alkalinity. It has also the peculiarity of not being precipitable by water.

I felt the desirability of such a mode of exhibiting bismuth, and therefore made an analysis of the solution for my own information; and as it possesses certain phases of interest, I now take this opportunity of placing it before the members of the Pharmaceutical Society.

A qualitative analysis elicited the following:—The solution contained bismuth, citric acid, and ammonia; not a trace of nitric acid could be detected in the solution. Liq. Bismuthi is therefore probably a solution of a basic salt, having a composition analogous to $3MOCi + MO$; one of the bases, MO, being replaced by BiO_3: it is made from the recently precipitated and well-washed oxide. From the peculiarity of having to deal with an alkaline bismuthic solution, direct precipitation with sulphide of ammonium was employed to determine the amount of bismuth present; this gave, on washing and drying, 0·327 grammes of BiS_3 in the fluid half-ounce, which represents 1·114 grains of the teroxide as being present in the drachm. Now, although the circular which accompanies the Liq. Bismuthi states that ʒj. is equivalent to a full dose (fifteen to twenty grains) of the insoluble trisnitrate, I do not think that such can be the case. The idea evidently is that the metal, when in the soluble form, is much more active than the ordinary insoluble modification, and there can be no doubt that it is so to a certain extent; but I should consider three grains to the drachm as the minimum dose: even more than this quantity may be easily introduced into such a solution as the above. The following is probably the mode pursued in making this solution:—430 grains of metallic bismuth are dissolved in a sufficient quantity of nitric acid, and this solution of ternitrate of bismuth is then precipitated with ammonia, and the resulting hydrated oxide well washed; 480 grains of citric acid are then exactly neutralized with ammonia, and the moist oxide is gradually added to the boiling solution of citrate of ammonia. The oxide is slowly but perfectly taken up. Ammonia is slightly evolved during the boiling, (probably from the decomposition of the citrate of ammonia *per se*,) but the solution becomes slightly acid, and remains so until the completion of the process. The solution is then neutralized with ammonia, and the whole is made to measure one pint. This solution will contain three grains of BiO_3 to the ʒj. It is more elegantly made by dissolving the citrate of bismuth in citrate of ammonia.*

Tartaric acid has also a similar action upon bismuth.

There seems to be a limit to the solubility of chemically pure citrate of bismuth; but the solubility is wonderfully increased

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* Citrate of bismuth is a very insoluble salt, got by the double decomposition of citrate of potash or soda, and ternitrate of bismuth. The citrate, as made in this manner, is extremely soluble in ammonia, or a solution of citrate of ammonia.

by the presence of mineral acids. This is, no doubt, due to the greater solubility of the salts formed by the latter acids in citrate of ammonia.

The reactions of this bismuthic solution are as follows:—

Ammonia and carbonate of ammonia give no precipitate. Potash and soda, or the carbonates of these alkalies, give precipitates insoluble in an excess of the precipitant. Nitric, sulphuric, and hydrochloric acids give precipitates soluble in an excess of the respective acids, and reprecipitable on neutralization with ammonia. These precipitates are also soluble on the further addition of ammonia. Water gives no precipitate. Sulphide of ammonium throws down the whole of the bismuth as sulphide.

As the reactions of citric and tartaric acids are at present little known, it is my intention to investigate the matter further, particularly with a view to its analytical bearing; but in the mean time, I place before you the results of my investigation of the Liq. Bismuthi.—*Lond. Pharm. Jour.*, Jan., 1

Mr. SCHACHT (of Clifton) said that although the author of the paper had not thought fit to mention his name in connection with the liquor bismuthi examined, there could be no doubt, from the quotation made from the circular, that the preparation the meeting had just heard so freely discussed was that made by himself. Assuming this to be the case, he could state that the author had well performed his task in submitting it to analysis. The preparation, sold as liquor bismuthi (Schacht) consisted of bismuth oxide, citric acid, and ammonia, and the quantity of oxide of bismuth present was one grain in each fluid drachm. This, however, had been published in the "Lancet" several months ago. A fact so easy of investigation he had never attempted to keep secret, but, on the contrary, he had told its composition to every medical man with whom he had conversed on the subject. He had adopted the name "Liquor Bismuthi (Schacht)," partly because having been fortunate several years ago in discovering this elegant method of holding bismuth in permanent solution, he was anxious to reap some measure of reward in the credit which would attach to so distinct an improvement as he believed this preparation to be; and partly also because, as the article can only exist in the form of solution, it was convenient that the profession should be invited to prescribe a medicine of one definite strength. In answer to the author's suggestion that it should be made three times as strong he (Mr. Schacht) had been accustomed to make it, he would observe that the quantity indicated as a dose—one drachm—was easy both to remember and to dispense, and he had abundance of evidence to prove that in such doses it was efficient, in many cases succeeding where full doses of from five to twenty grains of the trisnitrate had failed. He claimed the credit, such as it was, of having been the first to prepare and introduce to the profession a permanently fluid form of bismuth; and as his preparation had been a good deal employed during the last five or six years, it would be a great pity to alter its strength.

Dr. ATTFIELD said that the fact of the solubility of oxide of bismuth in citrate of ammonia had been observed by Mr. Spiller more than five years ago, and published, together with other observations relating to the influence of citric acid on chemical reactions, in the Journal of the Chemical Society. To Mr. Schacht, however, was no doubt due the practical application of this fact, and the production of what was apparently an excellent form of medicine for the administration of bismuth.

Mr. SQUIRE asked Mr. Schacht if any experiments had been made by medical men to determine the relative strengths and values of his preparation and the subnitrate.

Mr. SCHACHT said several cases had been reported to him by Dr. Martin, the senior physician to the Bristol Hospital and other men, in which benefit had resulted from the use of his preparation where the old insoluble form of subnitrate had either failed or proved less efficacious, but he could not at the moment refer to any experiments made with the special object of determining the relative strengths of the two medicines.

Mr. HASELDEN was glad to see Mr. Schacht present to speak for himself. He (Mr. Haselden) had frequently used his liquor bismuthi, and thought it a very elegant preparation. Some persons, on hastily reading the circular that was issued with it, might perhaps have concluded that each fluid drachm contained more than a grain of the oxide of bismuth, as it purported to represent fifteen or twenty grains of the subnitrate, but it was evident from Mr. Schacht's explanation that this soluble form of bismuth was much more active than the old insoluble form, and hence the much smaller dose proved equally, if not more, efficacious.

Dr. Redwood was anxious to say a word or two with reference to the name Mr. Schacht had given to his preparation. Now, that the composition of liquor bismuthi was no longer a secret, he thought it very desirable that a name should be given to it indicating what its composition was. He thought the practice of introducing new medicines under names that afforded no indication, or a very imperfect indication, of what they were, was much to be regretted. Such a practice often caused much inconvenience and difficulty to pharmaceutists in dispensing, and also deprived medical men of the means of ascribing the effects of such medicines to their true causes. He should be glad to know from Mr. Schacht whether he had formed any opinion as to the constitution of the compound of bismuth contained in his liquor bismuthi, and whether he had observed, as stated by Mr. Tichbourne, that ammonia was evolved when the oxide of bismuth was dissolved in the neutral citrate of ammonia. He knew that Mr. Schacht was not unaccustomed to speculations and investigations relating to the constitution of salts.

Mr. Schacht remarked that his process not being the same as that described by Mr. Tichbourne, he had not an opportunity of observing the effect referred to on dissolving the oxide in citrate of ammonia. He had, however, found it desirable to add a little excess of ammonia, so as to make the solution alkaline. He had no theory to suggest with reference to the constitution of the salt of bismuth present in the solution.

The President expressed the thanks of the meeting to the author of the paper for his communication, and to Mr. Schacht for the information he had given respecting his very elegant and efficient preparation of bismuth. He quite agreed, however, with Dr. Redwood, that the names given to medicines should, as far as possible, represent their composition.—*Trans. Pharm. Soc., Dec. 2d*, 1863.

ON THE ACTION OF OZONE ON ORGANIC SUBSTANCES.

By M. Gorup-Besanez.

In a previous memoir the author has examined the action of ozone on various substances dissolved or held in suspension in water. The products obtained, he finds, are sometimes analogous to those given by the reaction of peroxides at a higher temperature on the same substances.

This is not, however, generally the case, and certain bodies which are easily oxidized by peroxides entirely resist the action of ozone.

The experiments set forth by the author seem to him to show a remarkable coincidence between the mode of action of ozone, and that of the animal organism considered as an oxidizing agent.

The author at first completed his experiments on the action of ozone on certain substances in the absence of alkalies. To the bodies unattacked by ozone he adds unnitrogenized organic acids, such as acetic, butyric, palmitic, lactic, oxalic, tartaric, malic, and citric acids, also mannite, glycerine, and oleine. To the bodies which undergo transformation he has added tyrosine, which furnishes a brown matter analogous to M. Stædeler's erythrosine.

He then studied the influence of free alkalies, or carbonates on the oxidation of organic matters by ozone. He found that the presence of alkalies favors this oxidation, and sometimes changes the nature of the products formed.

Uric Acid.—A watery solution of pure uric acid, with the addition of a few drops of potash, absorbs the ozone in the same way as in the absence of potash, only that there is a continuous disengagement of ammonia. Urea and oxalic acid are found in the liquid, but no allantoine, which is formed with uric acid and ozone without alkali.

Urea quickly absorbs ozone ; ammonia is disengaged in presence of potash. When the absorption is completed, the liquid contains only carbonate of potash. Urea is not decomposable by ozone without alkalies.

Leucin.—At the beginning of the reaction a slight disengagement of ammonia takes place, which soon ceases, leaving the odor of valeric aldehyde. If at this moment a little of the liquid is supersaturated by an acid, the odor of cyanic acid will be perceived. After a time the addition of an acid causes the disengagement of carbonic acid only. By distilling the liquid first alone, and then with the addition of phosphoric acid, the presence of butyric acid and of other fatty volatile acids may be shown.

Grape sugar is not attacked by ozone, but in presence of soda, potash, or carbonate of soda, it is entirely transformed into carbonic and formic acids.

Cane sugar oxidizes much more slowly than grape sugar, but the same products are formed.

Glycerin at first gives a faint odor of acrolein. The liquid becomes gradually acid, and by the addition of another small quantity of alkali the reaction is sustained, and carbonate, formiate, and propionate of potash are obtained.

Olein absorbs ozone in presence of alkalies. Glycerin is first attacked, and furnishes acroleine and fatty volatile acids, while oleic and palmitic acids, set at liberty, combine with potash, and are then only slowly burnt. The reaction is the same if the caustic alkalies are replaced by carbonate of soda. This reaction is of some importance, as possibly explaining the decomposition of fatty matters in the blood.

Fatty Volatile Acids $(CH)nO_4$.—The only acids which resist the oxidizing action of ozone are simply burnt slowly and continuously in the presence of alkalies. On the completion of the reaction, only formic and carbonic acids are found in the liquid.

Solid fatty acids, such as palmitic and stearic acids, are attacked very slowly, even in presence of an excess of alkali. Carbonic acid is formed immediately, but no fatty acid containing a less number of carbon equivalents.

Benzoic and succinic acids yield only carbonic acid, but they are burnt much more rapidly than the fatty acids.

Oxalic acid is also transformed into carbonic acid, but very slowly.

Citric acid, in presence of an alkaline solution, rapidly takes up ozone, the products of the reaction being oxalic and carbonic acids.

Hippuric acid has not given very precise results; carbonic and formic acids were detected in the products. Nitrogen is not eliminated as ammonia; but the author has not found any nitrogenised product in the liquid.

Purified *bile*, that is to say the mixture of glycocholate and taurocholate of soda obtained by evaporating fresh ox bile, treating the residue by absolute alcohol, and decolorising the solution by animal charcoal, evaporating, recovering by water, and shaking the watery solution with ether so long as it takes up anything. Bile thus purified rapidly absorbs large qantities of ozone. At whatever stage of reaction the liquor is examined, there will be found in it, besides the undecomposed acids, only carbonic and sulphuric acids. This is another instance in which the author has been unable to decide under what form the nitrogen is eliminated.

Salicin.—After a few days the liquor becomes acid, when a few drops of alkali are added the action of the ozone continued until it was exhausted. No salicylic acid is to be found in the liquid, but only carbonic acid.

Gelatin is entirely transformed into a body with altogether different properties, not being in the form of jelly, and precipitating neither by tannic acid nor by bichloride of mercury, but only by alum, sulphate of copper, and mercurial nitrate.

Albumen, after the addition of a few drops of potash, behaves with respect to ozone the same as without this addition; it furnishes a body analogous to the peptones.

The author concludes by enforcing the analogy which seems to him to exist between these reactions and the combustion taking place in the animal organism.—*Lon. Chem. News*, Nov. 7, 1863, from *Annalen der Chemie und Parmacie*, cxxv., 207.

ON INDIUM.

By F. Reich and Th. Richter.

Imperfect as our researches on the properties of the new metal and its compounds must be, in consequence of the very small amount we have been able to obtain, we think it advisable to make known what we have discovered, as we see no prospect of procuring a larger quantity.

The situation of the bright blue we observed in the spectroscope is at 98 on the scale, and the paler at 135, that is when the sodium line is placed at 50 and the strontium line at 93. When the sodium line is 50 and the strontium 104, indium α will be 110, and indium β will stand at 147. Indium also gives a violet color when one of its salts is introduced into the flame of a Bunsen's jet, so that its presence can be recognised without the spectroscope.

The oxide, when reduced before the blow-pipe on charcoal, gives a white ductile metal resembling tin, but which marks paper clearer than lead. The metal dissolves in hydrochloric acid with some evolution of gas, and a platinum wire, moistened with the solution, shows a very intense blue line, which, however, is very evanescent.

The metal is easily fusible before the blow-pipe, and gives a residue which is a dark-yellow while hot, and pale straw-yellow when cold ; this residue is driven off with difficulty by the reduction flame, to which, in volatilising, it communicates a peculiar violet tinge.

The ignited oxide is always obtained yellowish, which is probably caused by a trace of iron oxide.

The hydrated oxide precipitated by ammonia is always white and slimy, so that it adheres to the side of the beaker. Tartaric acid added to a solution of the oxide prevents its precipitation by ammonia ; sulphide of ammonium added to the mixture causes a bulky white precipitate, colored pale greenish by a trace of iron.

Potash precipitates the hydrated oxide from acid solutions as perfectly as ammonia.

Carbonate of soda throws down a more crystalline precipitate, and the white deposit so obtained at a boiling heat, after drying, easily dissolves in dilute sulphuric acid with effervescence, showing that it is a carbonate of indium oxide.

The ignited oxide, heated to redness in a stream of dry hydrogen, forms no water and undergoes no change.

When mixed with charcoal, and heated to redness in a tube in a current of chlorine, it forms a volatile chloride, which condenses at the cold end of the tube. The chloride has a yellow color, probably from a trace of iron ; but single crystalline scales are seen, which appear colorless, and have a mother-of-pearl lustre.

The chloride is very deliquescent, and when dried again it partially decomposes.

The chloride shows the blue line with the greatest brilliancy, but, owing to its volatility, the line quickly disappears. If, however, some oxide is placed on a platinum spoon, and moistened with hydrochloric acid, the appearance of the blue line in the spectroscope is less brilliant, but more lasting, and by moistening afresh with the acid, the experiment may be repeated several times without renewing the oxide.

The solution of the reduced metal in hydrochloric acid, gave, with ammonia and sulphide of ammonium, a greyish brown precipitate; and further experiments were necessary to decide whether this color really belonged to the sulphide of indium or was caused by some impurities.

The purification of the oxide by successive treatment of the first solution with sulphuretted hydrogen, precipitation by ammonia, redissolving, and again precipitating by potash, gave the before-mentioned results. It remained to separate the iron. By the decomposition of the acid solution with excess of acetate of soda, and heating, the oxide of iron was thrown down, and the liquid still contained a good deal of oxide of indium, but a part of the latter went down with the oxide of iron.

It is best to precipitate the iron by the cautious addition of bicarbonate of soda. On boiling the filtrate, and adding a small quantity of soda salt, the oxide of indium is precipitated either as hydrate or carbonate.

The solution of the chloride obtained in the way before mentioned gave, with ferrocyanide of potassium, a white precipitate, colored bluish by a trace of iron. With ferridcyanide it gave no precipitate.

As oxide of indium bears much resemblance to thorina—from which, however, it may be distinguished by its insolubility in potash, and reducibility on charcoal—it may be mentioned that when moistened with cobalt solution and heated, it does not become blue, and ignited in hydrochloric acid it slowly, but perfectly dissolves. On adding a sulphate solution to a solution of sulphate of potash and evaporating, no alum crystals were obtained.

We have yet to discover in what minerals indium occurs. On passing chlorine gas over pieces of zinc blende, arsenical pyrites, and sulphur pyrites, we only obtained indium from the blende. Chloride of indium sublimed in the tube, but some remained behind with the chloride of zinc.

We have found indium in zinc distilled from Friburg ore, and have separated the oxide. A very large quantity of ammonia is requisite to obtain 0·1 per cent. of the oxide from the dissolved zinc, and this small quantity must be purified in the manner before described.—*Chem. News, London, Dec*, 12, 1863. from *Journal für Prakt. Chemie.*

ON MAUVE, OR ANILINE PURPLE.

By W. H. Perkins, F. C. S.*

The discovery of this coloring matter in 1856, and its introduction as a commercial article, have originated that remarkable series of compounds known as coal-tar colors, which have now become so numerous, and, in consequence of their adaptability to the arts and manufactures, are of such great and increasing importance. The chemistry of mauve may appear to have been rather neglected, its composition not having been established, although it has formed the subject of several papers by Continental chemists. Its chemical nature also has not been generally understood, and it is to this fact that many of the discrepancies between the results of the different experimentalists who have worked on this subject are to be attributed.

On adding a solution of hydrate of potassium to a boiling solution of commercial crystallised mauve, it immediately changes in color from purple to a blue violet, and, on standing, deposits a crystalline body, which, after being washed with alcohol and then with water, presents itself as a nearly black glistening body, not unlike pulverized specular iron ore.

This substance is a base which I propose to call *mauveine ;* it dissolves in alcohol, forming a violet solution, which immediately assumes a purple color on the addition of acids. It is insoluble, or nearly so, in ether and benzol. It is also a very stable body, and decomposes ammoniacal salts readily. When heated strongly

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* From the *Proceedings* of the Royal Society.

it decomposes, yielding a basic oil. Its analysis has led to the formula C_{27}*$H_{24}N_4$.

Hydrochlorate of Mauveine.—This salt is prepared by the direct combination of mauveine with hydrochloric acid. From its boiling alcoholic solution it is deposited in small prisms, sometimes arranged in tufts, possessing a brilliant green metallic lustre.

It is moderately soluble in alcohol. Carbon, hydrogen, nitrogen, and chlorine determinations have led to the formula $C_{27}H_{24}N_4HCl$.

I have endeavored to obtain a second hydrochlorate, but up to the present time have not succeeded.

Platinum Salt.—Mauveine forms a perfectly definite and beautifully crystalline compound with bichloride of platinum, which, if prepared with warm solutions, separates in the form of crystals of considerable dimensions. It posseses the green metallic lustre of the hydrochlorate, but, on being dried, assumes a more golden color. It is very sparingly soluble in alcohol. The analysis of this salt has led to the following formula:—

$$C_{27}H_{24}N_4,HPtCl_3.$$

Gold Salt.—This substance separates as a crystalline precipitate, which, when moist, presents a much less brilliant aspect than the platinum derivative; it is also more soluble in alcohol than that salt, and when re-crystallized appears to lose a small quantity of gold. Its analysis has given numbers agreeing with the formula—$C_{27}H_{24}N_4,HAuCl_4$.

Hydrobromate of Mauveine.—This salt is prepared in a similar manner to the hydrochlorate, which it very much resembles, except that it is less soluble. Carbon, hydrogen, and bromine determinations give results agreeing with the formula—

$$C_{27}H_{24}N_4HBr.$$

Hydriodate of Mauveine.—In preparing this salt from the base, it is necessary to use hydriodic acid, which is colorless, otherwise the iodine will slowly act upon the new product. It crystallizes in prisms, having a green metallic lustre. It is more

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* $C = 12$.

insoluble than the hydrobromate. Its analysis has led to the formula $C_{27}H_{24}N_4,HI$.

Acetate of Mauveine.—This salt is best obtained by dissolving the base in boiling alcohol and acetic acid. It is a beautiful salt, crystallizing in prisms possessing the green metallic lustre common to most of the salts of mauveine. Combinations of this substance gave numbers agreeing with the formula—

$$C_{24}H_{24}N_4,C_2H_4O_2.$$

Carbonate of Mauveine.—The tendency of mauveine to combine with carbonic acid is rather remarkable. If a quantity of its alcoholic solution be thrown up into a tube containing carbonic acid over mercury, the carbonic acid will be quickly absorbed. To prepare the carbonate it is necessary to pass carbonic acid gas through boiling alcohol containing a quantity of mauveine in suspension; it is then filtered quickly, and carbonic acid passed through the filtrate until cold; on standing the carbonate will be deposited as prisms having a green metallic lustre. This salt, on being dried, gradually loses carbonic acid. From experiments that have been made with this salt, it would appear to have the composition of an acid carbonate,—viz: $C_{27}H_{24}N_4H_2CO_3$.

In the analysis of salts of mauveine great care has to be taken in drying them thoroughly, as most of them are highly hygroscopic.

I am now engaged with the study of the replaceable hydrogen in mauveine, which I hope will throw some light upon its constitution. From its formula I believe it to be a tetramine, although up to the present I have not obtained any definite salts with more than one equivalent of acid. Mauveine, when heated with aniline, produces a blue coloring matter, which is now under investigation. A salt of mauveine, when heated alone, also produces a violet or blue compound.—*Chem. News, Lond.*, Nov. 21, 1863.

A NEW ALKALOID FOUND IN ACONITUM NAPELLUS; DESCRIPTION AND MODE OF PREPARATION.

By Messrs. T. and H. Smith.

In lately separating aconitina from *Aconitum Napellus*, a crystalline substance, new to us, presented itself, and on closer examination we found it to be possessed of alkaline properties. This circumstance interested us much; and not knowing of any like substance having been mentioned by any one who had examined *Aconitum Napellus*, we have thought a short statement of its characteristics, so far as they have yet been ascertained by us, might be acceptable to your readers.

Two characters of the substance render its separation exceedingly simple and easy,—these are, its almost absolute insolubility in neutral watery liquids, and its great solubility in excess of acid.

The juice of aconite-root having been evaporated to a soft extract, is exhausted with spirit of wine, and the spirit having been distilled off, the remainder is brought to an extract, which is also submitted to the action of spirit of wine, to be exhausted.

The spiritous liquid is now mixed up with milk of lime, using 1½ lb. for every cwt. of the fresh root. After filtration sulphuric acid is added, till there is no further precipitate. The spiritous solution being now filtered, is submitted to distillation for the recovery of the spirit. The watery portion left, after the separation of an abundant, dark-green, fatty matter, is filtered.

The liquid is now in a state for obtaining the new alkaloid. The liquid will be found strongly acid, and it is in virtue of this strong acid state that the substance in question is kept in solution, for it separates as soon as the acid is neutralized. A strong solution of carbonate of soda is therefore now added, at first very freely, as strong effervescence on the addition of more soda shows unmistakably the existence of excess of acid. Towards the end, however, the addition of the alkali must be more carefully made, and at considerable intervals; at the same time taking care to stir repeatedly and briskly. When the fluid has been brought to a nearly neutral state, but still slightly acid, it is to be left to itself for a day or two. None of the aconitina can be thrown down till the liquid becomes alkaline.

The next step to be taken is to filter the liquid from the abundant preciptate, which separates partly as a loose powder, and partly as a crystalline deposit on the sides of the precipitating vessel. This precipitate gives the new body observed by us, and, so far as we are aware, for the first time now described. We propose to name it Aconella.

It is easily obtained pure in snow-white crystalline tufts, by repeated crystallization from boiling spirit, with the aid of a little pure animal charcoal; for although it is very sparingly soluble in cold spirit, it has considerable solubility in boiling spirit, from which it readily crystallizes almost entirely on cooling.

Aconella is very insoluble in water, so much so that if a fraction of a grain be dissolved in a few ounces of water weakly acidulated, the clear liquid, on the addition of an excess of ammonia, becomes quite milky. It is soluble in 1·14 parts by measure of boiling rectified spirit (density ·840), but on cooling only about $\frac{1}{300}$ part is retained in solution.

It is moderately soluble in sulphuric ether, much more so in acetic ether, and quite remarkably so in chloroform,—comparable to camphor in this liquid, or powdered sugar in water.

It burns entirely away on platinum foil. When heated with soda lime, abundance of ammoniacal vapor is given off.

Aconella is precipitated from watery solutions by tincture of iodine.

Tannin does not precipitate the muriate, but the oxalate is precipitated by it. Corrosive sublimate precipitates aconella, as do also the terchloride of gold and the chloride of platinum.

One remarkable character belonging to it is its great tendency to crystallize, equalling, perhaps, in this respect even cantharidin itself, and thus permitting of its being confounded with but very few other bodies.

It will be unnecessary to give more than one very striking example to prove this. On evaporating two ounces of a cold saturated spiritous solution containing about three grains of the alkaloid to dryness, in a flat Berlin dish, and at a heat of about 120° Fahr.; instead of drying up, as might have been anticipated, in an amorphous state, every particle of the substance showed itself in a beautiful crystalline condition, white shining needles covering the whole bottom of the dish.

Although insoluble in water, it is very soluble in all the acids we have yet tried; and although these solutions be made in the presence of a large excess of the base, they invariably redden litmus; still, although such be the case, aconella, weakly however, turns reddened litmus-paper blue; for if a faintly reddened piece of litmus-paper be put into a boiling-hot spiritous solution, the blue color of the test-paper slowly but unmistakably returns. Readily crystallizable as the alkaloid itself is, we have not yet succeeded in getting any of its salts to crystallize, with the exception of the muriate; and even this salt crystallizes but slowly. If, however, the pure alkaloid be dissolved in spirit by the aid of muriatic acid in a glass beaker, and the beaker be then set aside uncovered, at the ordinary temperature, in the course of a few days at about an inch from the surface of the liquid, a broad ring of most beautifully delicate radiated crystals make their appearance; and in some days more the now comparatively watery liquid sets into a mass of snow-white, foggy tufts, arranged round the bottom of the beaker in amphitheatre-like form, so as to leave the glass at the centre of the bottom quite clear and bright.

From the following additional proofs in connection with what has been already stated, there cannot, we think, be any doubt that the new substance must be classed among the natural organic alkalies.

Aconella does not appear to have any poisonous quality. We gave three decigrammes to a cat, without the production of any apparent inconvenience to the animal.

Its harmless character naturally suggests the question whether the admittedly weak action of most of the aconitina of commerce may not arise from its mixture with aconella. Putting aside the idea of intentional adulteration, its inferior potency could very well be accounted for by the presence of this substance, without involving any imputation of blame, and only indicating ignorance of the means to be adopted for securing the purity of the aconitina.

As both aconitina and aconella are precipitated by alkalies, it is very probable that this mixed precipitate has been accepted by some operators as pure aconitina. In the process of purification, unless a quantity of acid be used not greater than is necessary to redissolve *only* the aconitina, both will be redissolved, and at the next precipitation they will go down together as before.

If the aconella has not already been removed in the preparation of aconitina, its presence can be prevented by carefully avoiding more than the faintest acid reaction in redissolving the aconitina.

Aconitina is a strong alkaloid, and therefore at once turns reddened litmus blue; on the contrary, all the solutions of aconella in acids, strongly redden litmus; therefore after redissolving the precipitate of aconitina, mixed with aconella in acids, the liquid should show, after sufficient time and agitation, only a slight acid reaction, else the aconitina when again precipitated will be mixed to a more or less extent with aconella. Even the use of ether will not secure the absence of aconella, because although aconitina is very soluble in ether, aconella is not by any means insoluble in that liquid.

Another probable cause of the deterioration of aconitina when mixed with aconella may be the absorption of the aconitina by the charcoal used in bleaching it. Charcoal has so remarkable an attraction for aconitina, that we have often seen it entirely absorbed by the charcoal; so that in purifying a mixture of aconitina and aconella, it might very readily happen, that the substance ultimately obtained would not contain a trace of aconitina.

The quantity of aconitina given by 1 cwt. of the fresh roots, never, so far as our experience goes, exceeds 1 oz. A simple calculation founded on the comparative strength of the aconite-root and pure aconitina, perhaps the most potent of all poisons, will show that no possible means could yield much more than that quantity.

The crystallization of a hot spiritous solution of aconella in gaslight presents a very remarkable and beautiful appearance. The whole body of the liquid seems to be incessantly emitting minute flashes of light, something like what might be expected from a shower of minute particles of incandescent lime—a sort of deflagration, but in a liquid medium. The phenomenon seems to be caused by the reflection of the light from the faces of crystals, continually forming and moving in the liquid, as they present to the incident rays the proper angle of reflection to the eye of the observer.

It is a very remarkable fact, that the characters of aconella bear a great resemblance to those of narcotina. The similarity is so great that we have compared them together to a certain extent, and although the comparison has not yet been carried out to produce the conviction of absolute identity, yet so far as it goes, it leads to the belief, that aconella is nothing else than narcotina. We may carry out the comparison and give the results; but in the meantime we will give the points of resemblance ascertained betwixt the two alkaloids.

Aconella is without taste in the solid state, so also is narcotina; the solutions of both however are very bitter.

Aconella is a very weak alkali, very soluble in acids, and the solutions are all strongly acid; the same remarks apply to narcotina.

Tincture of iodine precipitates aconella, it also precipitates narcotina.

Tannin precipitates aconella from an oxalic acid solution, but not from one in muriatic acid, characters also common to narcotina.

Aconella is remarkably soluble in chloroform, and the solution, spontaneously evaporated, presents a peculiar appearance; the very same peculiarity of appearance is shown with narcotina. The crystallizations of the two alkaloids from spirit are also exact counterparts of each other. They are both insoluble in caustic alkalies. On adding strong sulphuric acid to narcotine, hardly any color is produced, but on the addition of a minute particle of nitre a deep blood-red color is at once displayed; aconella answers in exactly the same way to this test. A specific-gravity bottle filled with a boiling-hot spiritous saturated solution of aconella—density of spirit ·840—was found, after deducting weight of bottle, to weigh 9·53 grammes. The weight of the crystalline solid after evaporation was 0·89 gramme. Consequently 1 part of aconella dissolves in 9·6 parts by weight of boiling spirit, or 11·4 by measure.

The same experiment was made with narcotina, and it will be observed that the two bodies give the same solubility almost to a nicety. The narcotina and spirit in specific-gravity bottle weighed 9·55 grammes. The weight of crystallized narcotina was 0·90 gramme. The equivalent of aconella determined by calculations from data obtained by experiment is almost exactly that of narcotina.

	Grammes.	Platinum obtained. Grammes.		Percentage of Platinum.	Average of Platinum
Weight of chloride of platinum and aconella manipulated upon.	3·065	0·465	=	15	15·66
	0·500	0·075	=	15	
	0·500	0·085	=	17	

Therefore $\overset{\text{Aver. of Pt.}}{15{\cdot}66} : \overset{\text{Comp.}}{100} :: \overset{\text{Pt.}}{99} : x =$ equiv. of compound. $x = 632{\cdot}18$

We thus obtain 632·18 as the equivalent of the double chloride.

As three equivalents of chlorine, one of platinum, and one of aconella make up the compound, the equivalent of aconella alone is obtained by deducting from the whole the chlorine and platinum.

$$\overset{\text{Cl.}}{35{\cdot}5} + 3 = 106{\cdot}5 + \overset{\text{Pt.}}{99} = 205{\cdot}5$$

Deducting this sum from 632·18, we have 426·68 left as the equivalent of aconella.

Narcotina, $C_{46}H_{25}NO_{14}$, has as its equivalent 427, a number so close to the calculated equivalent of aconella, that it seems to change to reality the supposition of these two alkaloids being one and the same, though obtained from plants belonging to different Natural Orders.—*Lond. Pharm. Jour., Jan.,* 1863.

Edinburgh, 18th December, 1863.

Minutes of the Philadelphia College of Pharmacy.

A Special Meeting of the College was held at the Hall, 2d mo., 5, 1864. The President in the chair.

The meeting was informed of the sudden death of Dr. Robert P. Thomas, a member of the College, and Professor in the School of Pharmacy.

The following Resolutions, prepared by the Secretary, were now read and, on motion, unanimously adopted, and directed to be published :—

The College, having heard with deep sorrow of the sudden removal by death of our late fellow-member, Dr. Robert P. Thomas, Professor of Materia Medica in the School of Pharmacy; therefore,

Resolved, That the connection of Dr. Thomas with this College has been such as to secure the esteem and regard of all connected with it. His loss will be especially felt by the numerous graduates and students of the School, who, while profiting by his instructions, have learned to respect and esteem him. By the members of the Board of Trustees and of the College at large, he will be lamented as a talented and warm-hearted associate, cut off in the midst of a career of usefulness and promise.

Resolved, That the members of the College will attend his funeral at the time and place appointed; that the appropriate Committee be directed to prepare a suitable memorial of Dr. Thomas, to be read at the approaching Annual Meeting, and published in the Journal, and that a copy of these Resolutions be furnished his family, with an expression of our sympathy for them in their bereavement.

On motion, the College adjourned.

Edward Parrish, *Secretary.*

Resolutions of the Zeta Phi Society.

At a regular meeting of the "Zeta Phi Society of the Philadelphia College of Pharmacy," held February 5th, 1864, the following preamble and resolutions were adopted:

Whereas, It has pleased an All-wise Providence to remove from among us our worthy and esteemed Professor, Dr. Robert P. Thomas, who has so long filled the chair of Materia Medica in this College; therefore,

Resolved, That we, as members of the "Zeta Phi Society of the Philadelphia College of Pharmacy, tender to the afflicted family of Dr. R. P. Thomas our heartfelt sympathy in their irreparable loss.

Resolved, That we sympathize with the Board of Trustees and the College at large, in the loss of so talented and warm-hearted a fellow-member, cut off suddenly as he has been in the midst of his usefulness and growing reputation.

Resolved, That the members of this Society, who have listened to his clear and lucid instructions, and have felt the influence of his calm and courteous demeanor, will ever cherish the remembrance of his virtues, and we trust will be influenced by his example throughout our lives.

Resolved, That this preamble and resolutions be entered on the minutes of this Society; that a copy be forwarded to the family of the deceased, and another to the Trustees of the College.

Signed on behalf of said Society by the Committee.

Albert E. Ebert,
Edward C. Jones, } Committee.
H. C. Croft,

Editorial Department.

The British Pharmacopœia has at last made its appearance in England, and a few copies have reached the United States, but we have not yet seen it. The February number of the Pharmaceutical Journal gives a view of some of its leading features, some of which it decidedly disapproves of. In the *first* place, the work is in English, the outside pressure in favor of the vernacular having overcome, very properly, the influence of the London College of Physicians. *Secondly,* the only divisions of weights known in the work, are the avoirdupois pound and ounce, and the troy grain. The measures are the imperial gallon and its divisions. In both weights and measures, the old symbols are entirely abandoned; Those for weights being lb. oz. and gr., and for measures, "fl. oz." for fluidounce, and "fl. dr." for fluidrachm. In *Nomenclature* many changes have been made,several of which are adoptions of our own names, as Hydrargyri Oxidum Rubrum, Hydrargyri Iodidum Viride, Chloroformum, Quiniæ Sulphas, Aconitia, etc.

Chemical Notation to express the composition of the chemicals has been adopted. Thus Nitric Acid is represented as $3HO, 2\ NO_5$.

The list of preparations omitted is very extensive, including 6 vinegars, 13 decoctions, 5 confections, 6 extracts, 5 infusions, 7 liquors, 6 pills, 10 spirits, 10 syrups, 12 tinctures, 9 troches, 7 ointments, and 4 wines.

We hope to have an early opportunity to examine its processes, and extract such as may be novel and interesting to our readers.

Internal Revenue Decision.—Mr. E. Fougera, of New York, writes us in reference to a recent letter from the Department of Internal Revenue. Mr. F. queried whether certain preparations which he makes, and the formulæ of which have been published in the medical and pharmaceutical journals, are subject to stamp duty,—labels having been submitted with the letter,—calling them "Fougera's Dragées," etc., and whether if stated "Dragées, etc., made by E. Fougera," they would be free from stamp duty. The following is the letter from the Deputy Commissioner;

OFFICIAL.

Treasury Department, Office of Internal Revenue.

WASHINGTON, February 6th, 1864.

SIR:—In reply to yours of the 23d ult., enclosing labels of sundry medicinal preparations, I have to say, that every preparation which is recommended as a remedy for any disease is subject to stamp duty, unless its full and proper formula is published in one of the text-books, or journals specified in section 107 of the Excise law, and the article is offered for sale under the same name, form and guise as those under which it is laid down in such text-book or journal.

The several imported articles to which you refer,—"Sulfate de Quinine de Robiquet," "Dragées de Proto-Iodure de fere de Gille," "Pilules de Blancard," "Ergotine de Bonjean," "Pastilles de lactate de fer de Gelis et Conté" and "Pilules Purgatives,"—are laid down under those names in the medical text-books, and therefore exempt from stamp duty.

If the formulas of the other preparations have been published with the names borne upon the labels submitted, I am without information of the fact. I cannot therefore give a more explicit answer as to their liability or exemption. Very respectfully, EDWARD A. ROLLINS,
Deputy Commissioner.

E. FOUGERA, Esq.,
30 N. William St., N. York City, N. Y.

Proceedings of the American Pharmaceutical Association at its eleventh Annual Meeting, held in Baltimore, Md., September, 1863. Also the Constitution and Roll of Members. Philad. 1863. pp. 321, octavo.

After more than usual delay the Proceedings for 1863 were published about the end of January, 1864, the result of various interfering circumstances only to be appreciated fully by those who have had such labor as it involves, to perform. As usual the first chapter is devoted to the Minutes of the meeting, which is much the same as that presented to our readers in November. Then follows the Report on Pharmacy, by Prof. Mayer, of New York. This document occupies 123 printed pages, and with slight alterations is arranged like that of Prof. Maisch, for 1862. The addition to Pharmaceutical and Chemical literature since last report, first claims notice followed by the usual record of observations and discoveries in Pharmacy and Materia Medica, (arranged according to the natural order.) This portion is an extensive reference to papers that have appeared in the principal Pharmaceutical and Chemical Journals of Europe and the United States. This chapter will be found to be particularly useful to investigators, giving, as it does, a bird's eye view of the accumulated labors of the past year. The remainder of the report is chiefly devoted to a record of the progress of Chemistry, inorganic and organic, so far as to note the papers and authorities, accompanied, in many instances, by short comments.

Dr. E. R. Squibb's Report on the Drug Market, follows, and is a new feature—being a replacement of the report on adulterated drugs in former Proceedings. This committee was appointed "To report annually the fluctuations in the supply and demand of drugs; the variations in quality; and adulterations and sophistications coming under their observation, or reported to them by others; and that they be authorized to make report on any adulterations and sophistications of immediate interest, through the Pharmaceutical Journals as soon as practicable after their discovery; and that all members are requested to furnish information of the kind required, to the Chairman, without unnecessary delay." The extent of this report will not admit of its publication here, but we give a few extracts to convey an idea of its character, and refer our readers to the Proceedings. The remarks on drugs apply chiefly to the New York market.

"*Aloes.* During a large proportion of the past year the better grades of aloes, namely, those prepared by exposing the juices of the plant to the sun and air only, in drying, have been very scarce and high, sometimes altogether absent from the market. The best varieties of the so-called socotrine aloes, characterized by a ruby-red color and fragrant aromatic odor, were very rarely to be had during the year, and the price even for lower grades, instead of 42 to 46 c., has been 65 to 85 c., and this without much variation either in the supply or price in foreign markets. With all this, the quality has been low and very variable, leading to the inference, not alone indicated by this article, that, particularly in these times, anything is good enough for the American markets. The inferior grades of aloes, known as Cape, Curaçoa, Bonaire, Barbadoes, and Hepatic, have varied much less from the usual prices, and, except the Barbadoes variety, have been abundant. Cape at 23 to 26 c., Curaçoa at 40 to 50 c.; Bonaire at 42 to 46 c.; and Hepatic at 60 to 70 c. Probably from an unusual demand for veterinary purposes, Barbadoes Aloes has been very scarce and occasionally absent.

Three varieties of Aloes are now officinal in the new Pharmacopœia under the names of Barbadensis, Capensis, and Socotrina, the definition of each, except the Cape variety, being based upon the species of the plant which is supposed to furnish it. The real practical difference, however, probably depends more upon the mode of preparation; and the names are to be regarded more as conventional indices of quality, than as evidences of the sources, either botanical or geographical, from whence the grades are obtained.

Belladonna. This article, though neither scarce nor high in price at any time within the past year, has been so uniformly bad in quality, that there has been great difficulty in getting any fit for use. Bales upon bales of it, of variegated dull colors, (excepting green,) musty or nearly odorless, containing various other plants, and in two instances, at least, a notable proportion of digitalis, could at all times be found, at prices from 22 to 30 c. per pound. From the frequently torn and rotten condition of the bales it might be inferred that the general stock was old, as well as otherwise bad, and yet this article must have been largely used within the past year for tinctures.

Camphor. This drug has been very high and somewhat variable in price, but of uniform quality and always in abundance. Next after sulphate of quinia and opium, this article is probably most subject to speculative variations in price and demand, whilst from its nature and properties as a concrete volatile oil, it is, of all drugs, perhaps the least susceptible to variations in quality, or to sophistication.

Cardamom. The short, heavy, plump capsule, with round, full, oily seed, and fine aromatic odor,—that is the true, unmixed Malabar cardamom, was only rarely to be found during the past year; while the long shrivelled capsule, with few, light-colored, flattened spongy seeds, of a dull, somewhat terebinthinate odor and taste, seemed to have taken possession of the market, and at prices which for the better variety, would have hitherto been fabulous. The occasional parcels of the better variety commanded prices such as $3.00 and 3.50 per pound, whilst the inferior qualities have been generally quoted at $2.00 to 2.75.

Cinchona. True Calisaya Bark, or Yellow Cinchona, has been in about the usual quantities, at prices from $1.65 to 1 85 per pound, and always easily accessible to the few who seek it. Like other articles of small demand, it has maintained a pretty even market, chiefly from being without the pale of speculation, and because its inferior representatives of the Cinchonas, are almost universally taken by pharmaceutists. Soon after the East Side or New Granadian barks took the place of this, in the manufacture of Sulphate of Quinia, they also appear to have been generally substituted in pharmacy, so that instead of a cinchona containing 2 to 3 per cent. of alkaloids, pharmaceutical preparations of the present day, are made from those which contain the half of one per cent., and cost from 15 to 70 c. per pound.

Red Bark, or Red Cinchona, is still less used, and has fewer substitutes. It is always to be had of excellent quality, at prices varying from $1.55 to 1.70 per pound.

Colchicum Root and Seed have been unusually scarce and high, and the root rarely of good quality. The ordinary market stock of the root has varied little in price, being usually sold at 20 to 24 c. But the more important seed has always been very high and variable in price, rarely below 60, and sometimes as high as 80 c. for fair parcels. The large, round, plump, brown, and bitter seed, commonly known as English Colchicum seed, has been almost entirely absent during the year, and the most careful buyers have generally been obliged to take the cleaner and better parcels of the black or German seed; and it is doubtful whether this variety, when well selected, is not as good as the first named.

Ipecacuanha. This drug, without material variation in quality, has been extremely high in price, and often very scarce. In February it was sold as high as $3.50 per pound, and has at no time fallen below $3.00. Some lots have appeared in the market during the year, that were damaged. In some cases the damaged portions are found throughout the ceroon. From having been put up in this condition, or in such a state as to assume this condition, it is designated in the market as "country damaged." Another condition also occasionally met with, wherein the damaged portions are upon the outside only, is known as "ship damaged." When the damage is slight, these conditions are rarely seen or recognized, except to obtain indemnity from foreign shippers or insurance companies, or to cheapen the market for sharp, close buyers. The above remarks apply only to what is known as Rio Ipecac., or Ipecac., from Rio Janeiro. The inferior Carthagena Ipecac. has been generally quoted at $2.40 to 2.62.

Jalap. This drug has also been sold at enormous prices throughout the year. From 90 c. per pound, it had by November, 1862, reached $2.00, and is now not to be had of fair average quality, short of $1.90. Although scarce, and not in large supply, there has been no time when good parcels could not be had at the prices asked; for, as is often the case, when prices are very high, the highest grades are of slowest sale, and rarely wanted. The Jalap of the last two years appears to contain more very small fusiform tubers, (not false or fusiform Jalap,) and more very large ones, so that it is less uniform or has the uniform portions selected for better markets.

Opium. The market for this drug has not been behind that of any other in the number and suddenness of its fluctuations. Always a favorite drug for speculation and investment, and like sulphate of quinia and camphor, always liable to run out into channels of speculation, among persons who have no knowledge of the article or the market, it easily becomes a leading bubble, to be inflated or compressed by each steamer's news of short crop, diminished stock, vigor of demand, difficulties of exchange, etc. Under ordinary circumstances, Smyrna Opium, of fair quality, is the only kind which reaches this market, and the stock in Boston, New York, and Philadelphia, is usually said to average 200 cases. Since the indiscriminate sale of prize goods from captured vessels, by the Government, however, all sorts of opium are to be found, and even without any attempt at very close buying, it is difficult to avoid this "prize opium," as it is technically called. The price of strictly prime Smyrna opium at the beginning of the year, (Sept., 1862,) was about $7.25 per pound. From this it arose with numerous fluctuations until March, when it reached $11.00, and from that point declined to the present time, when it is sold at $8.75, or thereabout, but has been as low as $8.10. Thirteen cases purchased with fair average distribution throughout the year, cost an average of $8.50, the lowest price paid being $7.31, and the highest, $11.00. This average is, however, by chance below that of the general market for the year."

To give an idea of the quality of leading pharmaceutical preparations, the Chairman obtained samples of six kinds from each of four of the principal cities of the Atlantic States, and subjected them to assay. These were Ether, Ether Fortior, Chloroform, Sweet Spt. Nitre, Hoffman's Anodyne and Laudanum, we quote in reference to two of them as follows:—

"*Sweet Spirit of Nitre.* The Spiritus Ætheris Nitrici of the old Pharmacopœia, and Spiritus Ætheris Nitrosi of the new.

Eleven specimens of this preparation, probably representing the entire supply of the market, were carefully and thoroughly examined, by a good process of assay, for the proportion of nitrous ether contained in them. The officinal preparation is a solution of nitrous ether in alcohol, and the solution contains 5 per cent. by volume of the nitrous ether, this being the medicinal agent, whilst the alcohol is added merely to dilute and preserve the ether. The s. g. of the officinal spirit is ·837 when freshly made, but increasing a little by age. The specific gravities of the specimens were ·893, ·906, ·876, ·898, ·934, ·852, ·847, ·852, ·858, ·848, and ·850. Not one of them being any where near the standard.

They severally contained the following percentage by volume of nitrous ether, namely, 2, 2, less than 1, 2·5, less than 1, 2·25, 2·3, 2·4, 1·5, 1·5, per cent. Thus not one single specimen contained as much as half the officinal proportion of nitrous ether, though three of them came pretty nearly up to half strength. Of the remainder none exceed two-fifths, and five are below two-fifths, and do not average one-fourth strength. The prices paid for these were 17 c., 20 c., 20 c., 20 c., 25 c., 30 c., unknown, unknown, unknown, 55 c., and 40 c., per pound, and as usual, there is no relation between price and quality, that sold at 40 c., containing 1·5 percent., and that sold at 17 c., containing 1 per cent. of nitrous ether. A little more than seven years ago, the Chairman of this Committee went over this ground in a similar manner, and published the results. These were about the same as those now obtained, showing that there has been no improvement whatever in the market for this article during that time. The preparation cannot be honestly nor properly made by the usual process, nor at the usual price at which it is sold, and all manufacturers know this perfectly well, and yet go on, regardless of of anything but the profits to be realized by their dishonesty; and pharmaceutists, though repeatedly appealed to on behalf of this and other preparations, knowingly continue to dispense them.

Compound Spirit of Ether. The Spiritus Ætheris Compositus of the Pharmacopœia, or Hoffman's Anodyne. Eleven specimens of this preparation were examined. Not one of these was officinal in any single respect, nor in any degree, and not one contained any true heavy oil of wine. One specimen professed, by the label, to be strictly officinal. This answered most of the officinal tests, and certainly contained some compound of sulphuric acid in small proportion, but whatever this was, it was not the officinal heavy oil of wine, nor in the officinal proportion. This, therefore, was probably a strictly fraudulent preparation, got up carefully and skilfully for the purpose of deception, and is calculated to deceive, except that the delicate characteristic fruity odor of heavy oil of wine is absent. This, however, would only be likely to be detected by comparison, by those not very familiar with the officinal article. It is curious that this specimen appears to have been made by the same manufacturer as the very best specimen of Ether Fortior. Four of the other specimens contained light oil of wine enough to render water milky, and were so nearly alike in other respects, as to render it probable that they came from the same manufactory. All the specimens, except that specially alluded to above, were mere mixtures of dirty ether, generally in less than the officinal proportion, with dilute alcohol, and were probably made from the residue in rectifying ether. The prices charged for these were 75 c., 25 c., 25 c., 25 c., 30 c., 30., 38 c., unknown, unknown, 50 c., and 25 c., all except one being far below one-half of the neat cost of making the officinal article, and a great majority of pharmaceutists are aware of this fact.

Laudanum—The Tinctura Opii of the Pharmacopœia. It was thought by the Committee that it would be well to examine a represenative from the class of Tinctures; and this one was selected for its primary importance, its simplicity, and the facility with which opium of good quality can always be obtained when desired, An accurate morphia assay is, however, one of the most difficult in the whole domain of ordinary research, requiring more time and skill than was at the command of the Committee. It was therefore determined by experiment that a uniform process for precipitating all the alkaloids could be adopted and relied upon as giving a tolerable close comparison of the narcotic value of the specimens to which it was applied. Fifty cubic centimeters of the Standard Tincture of the Pharmacopœia yielded 0·604 grammes of mixed alkaloids by the process adopted. Eleven specimens, treated precisely in the same way, gave the following results, namely: ·424, ·347, ·343, ·308, ·486, ·468, ·480, ·427, ·340, ·338, and ·357. These figures indicate that one of the specimens is but just about half strength. Five are in the neighborhood of seven-twelfths, and the remaining five vary between eight and ten-twelfths of the officinal strength.

These preparations cost 1·00, 1·00, 1·12, 1·00, ·88, 1·06, unknown, unknown, unknown, 1·12, and 1·00 per pound.

Opium by the case, in the hands of the importers, has brought an average price of at least $8·50 per pound throughout the past year, and this opium in drying loses an average of 20 per cent. in weight and there are but about 14½ troy ounces in the avoirdupois pound, while each pound of the officinal Tincture represents 1¼ troy ounces of dried and powdered opium. Therefore, at the neat cash price of opium, the quantity represented in a pound of properly made tincture costs over one dollar. Now upon the theory that druggists are generally honest, and are selling their tinctures below the neat cost of the principal ingredient, regardless of cost of menstruum, time, labor, and general expenses,—to say nothing of profits,—this preparation may be all right if the above results of examination be all wrong. But if this theory be too absurd for general credence, then these druggists and pharmacuetists are chargeable in their practice with an amount of dishonesty which, in the shape of a more bold and manly variety of robbery, would be likely to restrict their opportunities of wrongdoing to the narrower sphere of the criminal prisons.

From this exhibition of the character of six prominent represenative preparations from the market of the class to which they belong, it appears that although not one of them comes fully up to the officinal standard, yet that, by a liberal admission, two of the most important ones may be considered to be nearly right, and to be progressing in the desired direction of becoming entirely right. The three important ones of the remaining four, however, exhibits a low character discreditable alike to the professions of medicine and pharmacy, and to human nature in general; and those pharmaceutists whose moral perceptions at this day are left keen enough to appreciate the condition of their art, and whose energy is sufficient, certainly have a most enviable reputation and standing within their reach, by opposing the condition of things thus indicated, through what appears to be the rarely trodden path of moral rectitude. Let some of us then try how it will pay to be right where many are wrong, and try what the profits of such a new drug market will be."

Of the special reports and essays, several have been printed in our last number, and in this, including the paper of the late Professor Thomas on Sanguinarina as a representative of Bloodroot in therapeutics. This is, so far as we are aware, the last paper written by the lamented author, and exhibits the thorough manner usual with him in such investigations. Prof. Mayer's paper on the active principles of the Strychnaceæ possesses much interest and exhibits the relative proportions of Strychnia and Brucia in the drugs and some of their preparations.

The paper by the Editor of this Journal on Fluid Extracts is intended as a revision of a former paper by the same author in the Proceedings of 1859. Other papers by F. Bringhurst on Oxides of Iron, Maisch on Tartaric Acid and American SO^3HO, Scattergood on Marl as a source of potash, F. Stearns on Æsthetical Pharmacy, and Parrish on the Revenue Law, etc., are well written papers, and in various ways, add to the usefulness and interest of the work.

The Editor, Alfred B. Taylor, has done his work well, and so far as we have examined, the volume has been passed through the press more correctly than any of its predecessors. This should compensate for the delay in its appearance. It has been usual for the Executive Committee to fix the price and note it in the preparatory remarks, which has not been done. The printing and paper compare favorably with the preceding volumes.

A Treatise on Pharmacy designed as a text-book for the Student, and as a Guide for the Physician and Pharmaceutist, containing the officinal and many unofficinal formulas, and numerous examples of extemporaneous prescriptions. By Edward Parrish, Graduate in Pharmacy, &c. Third edition, thoroughly revised and improved with important additions, with 238 illustrations. Philadelphia: Blanchard & Lea, 1864, pp. 850.

Our readers are too well acquainted with the previous editions of this book to need any general description of its construction. We will, therefore, in remarking on what is new in the work, indicate the more important changes, or improvements and additions. Up to the chapter on tinctures, the alterations, etc., are not extensive. Here we have a new feature. Under the name of "Working Formulæ," the formulæ of the U.S. Pharmacopœia are introduced in groups under each head, with little, if any, comments, and these are followed by various unofficinal recipes, in the same manner. This is a decided improvement on the last edition, enabling the reader to use the book in lieu of the Pharmacopœia during reference or comparison of the unofficinal formulæ with the officinal. Tinctures, wines, vinegars, infusions, etc., are all grouped together as consequents of the processes of solution, a description of which precedes them.

The next groups of preparations requiring heat they are prefaced by a chapter on the generation of heat for pharmaceutical purposes. The author confines himself chiefly to lamp and gas heating arrangements, of which he gives many illustrations, referring the reader to works on manipulation for furnace arrangements. With entire approval of this chapter as far as it goes, we cannot but regret that the author did not see the need in a *treatise*, as he now claims this to be, of giving at least the simpler furnace arrangements and manipulations to be used in illustration of those formulæ where such instruments are called for in officinal recipes. On the other hand we advocate, to the utmost extent, the use of gas in such operations as syrup-making and evaporations in quantities not too extended for the scope of a shop counter. The classes are extracts, fluid extracts, oleoresins, syrups, the solid preparations of sugar lozenges, etc. The formulæ of the U. S. Pharmacopœia and many unofficinal recipes are here detailed. We cannot withhold a little criticism in reference to the author's manner of treating his subject. Instead of accompanying each "working formula" by a suitable commentary, throwing light on peculiarities of the process, if any exist, or giving explanations of manipulations that to the student or beginner may appear obscure or unmeaning, he prefers to give a running commentary in preliminary remarks often of a general or abstract character, without, in the least degree, explaining the processes. This remark applies more pointedly to the Pharmacopœia preparations, as many of the unofficinal recipés have a paragraph in addition.

Chapter xvi. entitled "Extracta resina" and "concentrated remédies," savors so much of "Eclecticism," as to call forth a remark. The text of the chapter consists of the three officinal resins of Jalap, Podophyllum, and Scammony. The propriety of so far recognising such compounds as "Asclepidin," "Barosmin," "Cerasein," is much to be doubted. It is time enough to recognise preparations of which a formula has been published and tried, but to notice such as the above, is on a par with introducing a list of the panaceas, alteratives, and other quackery of the day. The book of "Dr. Coe" is written expressly to introduce the class of nostrums of which it treats, just as any ordinary quack would write a pamphlet to expound all the points in the history of his preparation, except the formula and composition.

The subject of distillation receives only a slight notice in chapter xvii. The author deems it out of place to devote much space to this operation in reference to the complex apparatus of the manufacturing laboratory, as not appropriate to works of the scope of this. The importance of distillation, as a branch of pharmaceutical manipulations, is greater now than ever before in relation to the recovery of alcohol, yet this is one of its simplest objects. There are so many cases where the operation is needed, requiring judgment for its correct adaptation, and a little more detail would have been useful. As a preliminary to the chapters on inorganic chemistry, retort distillation is noticed with various refrigerating arrangements. As an appendix to chapter xvii., the author has introduced recipes for a variety of fancy odors and toilet articles, mouth washes, sachets, pastilles, etc., which, in the opinion of many, will add to the value of the book as a formulary.

Part third is entitled Inorganic Chemistry, and embraces about 176 pages of closely printed matter. The author has aimed to embrace within this space notices of nearly all the inorganic chemicals used in medicine, and their preparations, arranged in groups as elements, acids, alkalies, earths, and metals. This will be found a useful part of the work, bringing, as it does, so many preparations not usually found in close groups together, when they can be consulted quickly. The Pharmacopœia processes for chemicals are introduced. The appendage of hints of the therapeutical objects,applications, and the doses of these preparations will be found by no means the least useful part of this division.

Part IV. is "Pharmacy in its relations to Organic Chemistry." Nearly

200 pages are devoted to this subject. In the first edition, it occupied 90 pages; in the second 156 pages. Whilst in former editions, Part iv. was devoted to inorganic chemicals, being preceded by the organic in the third edition, this has been reversed in accordance with the usual arrangement of *chemical* treatises. Most standard pharmaceutical works, however, observe the former order. The arrangement adopted for this part of the work is simple and appropriate for reference, commencing with the carbohydrates, alcohols, ethers, fixed oils volatile oils, and resins, acids, alkaloids, and neutral active principles. The author justly claims this and the preceding division to be the scientific portion of his work, and which, "by the valuable assistance of Prof. J. M. Maisch, has been rendered still more accurate, and brought up to the existing state of Chemical Science." With the old title of "Introduction to *practical* Pharmacy," much that is in this division would be out of place, but it is observed that the book is now called "*A treatise on Pharmacy*," etc. The propriety of introducing so much purely scientific matter into a work designed for the practical apothecary, might well be doubted; but the author claims a wider scope for his book, calling it a *text-book* for the student and a *guide* to the physician and pharmaceutist, and there is no information in it that is not useful, practically, or by way of accomplishment, to the pharmaceutist. There is a tendency, often observed, when a book addressed to any large class of readers proves successful, to increase its scope by introducing everything likely to add to its value as a store-house of facts. The U. S. Dispensatory has in this way become very comprehensive, and our author, though in a different manner, has adapted the same course, The work is essentially a compilation, built up from the journals and current literature of pharmacy and chemistry, and adapted to the wants of the classes for whom it is written by simplicity of arrangement and great absence of technicality, except in the third and fourth divisions where it is necessary to express tersely much information by means of symbols. In looking over the work for the impress of the author's individuality, we find it more in a sort of generalizing commentary, running throughout the pharmaceutical part of the work than in any systematic elimination of his opinions of the various formulæ based on practical experience. This is a desideratum yet to be attained in English or American pharmacy, and an idea of which is conveyed most forcibly in the little translation of Wittstein by Darby.

The last and fifth part of the book is entitled "Extemporaneous Pharmacy." The first portion of this is devoted to the art of prescribing, so far as it relates to writing prescriptions, and selecting and combining medicines. The other chapters embrace notices of powders, pills, suppositories, mixtures, styptics, collyria, anemata, gargles, ointments, cerates, plasters, etc., including many formulas for each of these preparations, making this part of the book almost a formulary for extemporaneous preparations.

The final chapter is on dispensing and compounding prescriptions, and the arrangements of the shop and counter most favorable for carrying out the processes of dispensing; including pill making, plaster spreading, suppository moulding, etc. No part of the work contains the impress of the author's style more than this, and its precepts will be found highly valuable by a numerous class of readers, including medical and pharmaceutical students, and illy educated proprietors of stores, who have embarked in the important and responsible business of dispensing, with less knowledge of pharmacy than a militia man knows of the art of war.

In taking a retrospective glance at the pages we have gone over, we are conscious of the presence of many points that might be improved, of some formulæ that might have been omitted, and of some chapters that need extending. Our time has not permitted to examine the typographical correctness of the great part of the work to see if it has escaped errors of the press, yet, in the examination we have given it, none of much importance have been detected. As a whole we believe it to be a very useful handbook for the apothecary, and deserving of his patronage; whilst there is so much within its covers valuable to the physician, that it may well occupy a place on his shelf for books of daily reference. The publisher's part has been well executed.

OBITUARY.—Died on the 3d of February, 1864, DR. ROBERT P. THOMAS, Professor of Materia Medica, in the Philadelphia College of Pharmacy, aged 43 years. This melancholy event, which has cast a gloomy shadow over the interests of our College, occurred very suddenly, the sufferer being stricken down by spotted fever within twelve hours from the conclusion of his last lecture, and he survived the blow but thirty-six hours. Dr. Thomas was suffering slightly from a cold, and was undoubtedly depressed at the time of his seizure, which was almost immediately followed by insensibility and spasms, from which he did not recover until death closed the scene.

Dr. Thomas was elected to the Chair of Materia Medica in 1850. His abilities as a teacher of that branch have been constantly in the ascendant, and at the period of his decease he was undoubtedly one of the ablest lecturers on Maieria Medica in the United States. An association of many years has endeared him to his colleagues and the members of the College generally, for his genial and social qualities, and for his valuable services to their institution, both as a teacher and a member. His class have deeply felt his loss, and by resolutions at page 180, that portion of them constituting the Zeta Phi Society give a voice to their feelings.

As the resolutions passed by the College (see page 180), direct the appropriate committee to prepare an obituary notice of the deceased, we withhold further remark on his past life, marked as it was with much to encourage the student to persevere in holding fast to his integrity.

PROF. FRANKLIN SCAMMON died at Chicago, Illinois, on the 10th of February, 1864, after a painful and protracted illness.

Dr. Scammon was the son of Hon. Eliakim Scammon, of East Pittston, Kennebec County, Maine. He was born in Whitefield, Lincoln County, Maine, October 23, 1810, and was in his 54th year. In early life he was an apothecary in Hallowell, Maine, but afterwards studied medicine, graduated in Philadelphia, and practiced Medicine in Hallowell. In 1850, he removed to Chicago, where, in various capacities, he continued to reside until his death. Dr. Scammon at the institution of the Chicago College of Pharmacy several years ago, became its President and one of its Professors. His tastes were scientific, and Botany particularly received his attention, being considered one of the ablest botanists of the West. A year or two before his death, Prof. Scammon was elected to the botanical chair in the University of Chicago, and discharged his duties last year with ability. He was maturing a plan for a Botanical Garden at the time of his decease. He was a remarkably kind, considerate, and just man; his loss will be particularly felt by his friends, as well as at the Academy of Science, of which he was an active member, and at one time its President. His life has been one of active usefulness, and his death is represented to have been such as becomes the true Christian.

Frederick Brown, Pharmaceutist, of Philadelphia, died on the 27th of February, 1864, in the 68th year of his age, of a painful illness from which he has been suffering for several months.

Mr. Brown entered the establishment of the late Charles Marshall, about the year 1812, and commenced his business in the year 1820, at the corner of 5th and Chestnut Streets, where it has ever since been conducted. He was one of the earliest members of the College of Pharmacy, but never took an active interest in its affairs. As a pharmaceutist he was one of the first to adopt the modern methods of conducting the business, and his establishment always enjoyed a good reputation, which in no small degree was owing to his personal popularity with his patrons.

As a business man, Mr. Brown possessed more than ordinary ability, uniting enterprize with cautiousness in operating, which lead him to wealth. In public life he was connected with the banking and other public and benevolent institutions, to which he gave much of his time and attention, but so far as we know, his tendencies never assumed a scientific direction. Those who knew Mr. Brown best, speak of him as generous in his business relations with other druggists, and charitable to the needy. He leaves a widow, a daughter, and three sons, one of whom he had recently associated with himself in business, and who will be his successor.

ADVERTISING SHEET. MARCH, 1864.

SCALE OF CHARGES FOR ADVERTISEMENTS.

	for one insertion,	per annum
For 10 lines of a column,	$1 00,	$5 00
For half a column, or ¼ of page	" 2 00,	" 7 00
For a column, or half a page,	" 3 00,	" 12 00
For one page,	" 5 00,	" 20 00

When the advertisement is not altered during the year, the prices are $15 00 per page, and $10 00 per half page, or a column, the other charges remaining the same, whether altered or not.

WM. M. DICKSON,

Agent for the Purchase and Sale of City and Country Drug Stores, Drug Store Fixtures, &c.,

ALSO,

For procuring SITUATIONS and ASSISTANTS in DRUG STORES only.

Subscriptions received for the "American Druggists' Circular."

No. 430 Walnut Street,
May, 1863—1y. Philadelphia.

HENRY HAVILAND,

23 John Street, New York,

IMPORTER OF

LUBIN'S EXTRACTS,
LOW'S BROWN WINDSOR SOAP,
FINE ESSENTIAL OILS,
FINE PHARMACEUTICAL PREPARATIONS,
BRUSHES, COMBS, PERFUMERY, &c., &c.

And many out of the way articles heretofore difficult to find in one assortment.

Especial pains taken to select goods of the best quality.

May, 1861—1y.

REMOVAL.

MERRIHEW & THOMPSON,

BOOK AND GENERAL JOB PRINTERS,

HAVE REMOVED

From their Old Stand, No. 126 South Second Street and No. 2 Kenton Place, to

243 ARCH St.,

Below Third, (North side,)

PHILADELPHIA

NOTICE.

The co-partnership of CHARLES ELLIS & CO., having been dissolved on the first day of First month, 1863, CHARLES ELLIS and his son EVAN T. ELLIS have associated with them WILLIAM M. ELLICOT, JR., under the Firm of

CHARLES ELLIS, SON & CO.,

AND HAVING

REMOVED

To the conveniently located warehouse,

N. E. corner of Market and Seventh Streets,

will continue the DRUG BUSINESS

AND THE

MANUFACTURE OF CHEMICALS,

as heretofore. They have largely increased their stock of Fresh Drugs and Medicines and pure essential Oils, and will continue to offer to purchasers a full supply of the best quality of articles in their line.

In connection with their establishment on Market Street, they have the

CHEMICAL LABORATORY,

At the old stand, S. E. corner of 6th and Morris Sts., the products of which are manufactured under their personal supervision; and they are thus enabled to supply them on the most reasonable terms, and at the same time to recommend them for their purity and uniformity of strength.

The following are some of the preparations manufactured at their Laboratory.

THE MEDICINAL SOLID AND FLUID EXTRACTS:

Prepared with great care from selected drugs.

PREPARATIONS OF AMMONIA—Liquor, Aromatic Spirit, &c.

ROSE WATER, distilled from leaves.

SIMPLE and CANTHARIDAL COLLODION.

CONFECTIONS—of Rose, Senna, &c.

OFFICINAL CERATES, Ointments, Syrups, &c.

BLUE MASS (PIL. HYDRARG.) of officinal strength and of superior consistence. Mercurial Ointment, one-half and one-third mercury. Mercury with Chalk. Mercury with Magnesia, &c.

GLYCERINE INODOROUS. CYANIDE OF POTASS.

CHLORIDE OF SODA, in G. S. bottles,

SPT. OF NITRIC ETHER, SPT. OF LAVENDER AND ROSEMARY. TANNIN—in oz. bottles, &c. &c. &c.

ADHESIVE PLASTER ON MUSLIN, (Ellis') we manufacture, and spread in large quantities, and, from the testimony of our most eminent surgeons, it is believed not to be surpassed.

PLASTERS of fine quality in half pound rolls, of the different kinds in use.

CORN PLASTER (Ellis') Circular, put up in boxes.

Machine-spread Plasters, put up in boxes containing one dozen each.

PRECIPITATED CARBONATE OF IRON. Soluble Citrate, and Tartrate in scales. Pyrophosphate of Iron. Ferrated Tincture and Elixir of Bark. Monsel's Salt and Solution, (a new styptic), &c.

CITRATE OF MAGNESIA (Ellis') is put up in 12 oz. bottles, and is so well known as to need no comment.

PREPARED CITRATE OF MAGNESIA (Ellis')—an effervescing preparation in powder, put up in bottles, with directions for use.

WISTAR'S COUGH LOZENGES.

FINE WILLOW CHARCOAL, (Ellis') in bottles and in bulk.

ELIXIR OF CALISAYA BARK AND IRON, an elegant combination.

ELIXIR VALERIANATE OF AMMONIA.

SYRUP OF THE PHOSPHATES, (Chemical Food) put up in 1lb. bottles.

SYRUP OF LACTUCARIUM, &c. &c.

Together with a great variety of articles suited to the dispensing trade, to which attention is invited.

CHARLES ELLIS, SON & CO.

Philad., 1*st mo.* 1863. **Market St., N. E. corner of 7th.**

PRICE LIST

OF

SUGAR COATED PILLS & GRANULES,

MANUFACTURED BY

BULLOCK & CRENSHAW,

Nos. 103 and 105 North Sixth Street, Philadelphia.

☞These Pills and Granules are accurately compounded of the very best materials, and can be confidently relied upon.

PILLS.	Bottles containing 100 each.	Bottles containing 500 each
PIL: Aloes, U. S. P.	$0 37½ per bot.	$1 62½ per bot.
“ Aloes et Assafœt: U. S. P.	37½ “	1 62½ “
“ Aloes et Ferri :	37½ “	1 62½ “
“ Aloes et Mastich: (See Pil: Stomachicæ.)	37½ “	1 62½ “
“ Aloes et Myrrhæ U. S. P.	37½ “	1 62½ “
“ Anderson's Scots.	37½ “	1 62½ “
“ Anti-bilious (Vegetable)	45 “	2 00 “
“ Aperient	45 “	2 00 “
“ Assafœtidæ, U. S. P.	37½ “	1 62½ “
“ Assafœt: Comp	37½ “	1 62½ “
“ Assafœt: et Rhei	37½ “	1 62½ “
“ Bismuth: Subnit: 3 grs.	50 “	2 25 “
“ “ Subcarb: 3 grs.	50 “	2 25 “
“ Calomel: 3 grs.	37½ “	1 62½ “
“ “ 5 “	37½ “	1 62½ “
“ Calomel: Comp: (Plummer's) 3 grs.	37½ “	2 25 “
“ Calomel et Opii.	50 “	2 25 “
“ Calomel et Rhei	37½ “	1 62½ “
“ Cathart: Comp: U. S. P.	45 “	2 00 “
“ Cerii Oxalat: (Oxalate of Cerium, 1 gr.)	50 “	2 25 “
“ Cinchon: Sulph: 1½ grs.	50 “	1 62½ “
“ Cook's 3 grs.	37½ “	1 62½ “
“ Colocynthidis Comp: 3 grs. (Ext: Coloc: Comp: U. S. P.)	50 “	2 25 “
“ Copaibæ, U. S. P. 3 grs.	37½ “	1 62½ “
“ Copaibæ et Ext: Cubebæ.	37½ “	1 62½ “
“ Copaibæ Comp.	37½ “	2 25 “
“ Fel: Bovinum.	50 “	1 62½ “
“ Ferri (Quevenne's) 1 gr.	37½ “	1 62½ “
“ Ferri Carb: (Vallett's) U. S. P. 3 grs.	37½ “	1 62½ “
“ Ferri Citrat: 2 grs.	37½ “	1 62½ “
“ Ferri Comp: U. S. P.	37½ “	2 25 “
“ Ferri Iodid: 1 gr.	50 “	1 62½ “
“ Ferri Lactat: 1 gr.	37½ “	3 50 “
“ Ferri Valer: 1 gr.	75 “	2 25 “
“ Ferri et Quin: Cit: 1 gr.	50 “	2 87½ “
“ Ferri et Strychniæ.	62½ “	1 62½ “
“ Ferri et Strychniæ. Cit: 1 gr.	37½ “	1 62½ “
“ Galban: Comp: U. S. P.	37½ “	1 62½ “
“ Gent: Comp.	37½ “	1 62½ “
“ Gonorrhœa	37½ “	1 62½ “
“ Hooper (Female Pills)	37½ “	1 62½ “
“ Hydrargyri, U. S. P., 3 grs.	37½ “	1 62½ “
“ Hydrargyri, 5 grs.	37½ “	1 62½ “
“ Hyd: Comp.	37½ “	1 62½ “
“ Ipecac: et Opii, 3½ grs. Pulv: Doveri, (U. S. P.)	50 “	2 25 “
“ Leptand: Comp:	50 “	2 25 “
“ Opii, U. S. P., 1 gr.	50 “	2 25 “
“ Opii et Camphoræ	62½ “	2 87 “
“ Opii et Plumbi Acet:	50 “	2 25 “
“ Quiniæ Sulph: 1 gr.	1 50 “	7 25 “
“ Quiniæ Sulph: 2 grs.	2 75 “	13 50 “
“ Quiniæ Comp:	1 75 “	8 50 “
“ Quiniæ et Ext: Belladon:	1 50 “	7 25 “
“ Rhei, U. S. P.	37½ “	1 62½ “
“ Rhei Comp: U. S. P.	37½ “	1 62½ “
“ Scillæ Comp: U. S. P.	37½ “	1 62½ “
“ Stomachicæ, (Lady Webster's Dinner Pills,) 3 grs.	37½ “	1 62½ “
“ Zinci Valerian: 1 gr	75 “	3 50 “
GRANULES. Acid Arsenious 1-20 gr.	25 “	1 00 “
“ “ “ 1-50 gr.	25 “	1 00 “
“ Aconitia, 1-60 gr.	50 “	2 25 “
“ Atropia, 1-60 gr.	50 “	2 25 “
“ Corrosive Sublimate, 1-12 gr.	25 “	1 00 “
“ Digitalin, 1-60 gr.	50 “	2 25 “
“ Elaterium (Clutterbuck's) 1-10 gr.	50 “	2 25 “
“ Extract Belladona, Eng: ¼ gr.	25 “	1 00 “
“ “ Cannabis Indica ¼ gr.	37½ “	1 62½ “
“ “ Hyoscyamus, Eng: ½ gr	25 “	1 00 “
“ “ Nux Vomica, ½ gr.	37½ “	1 62½ “
“ Mercury Iodide, ¼ gr.	25 “	1 00 “
“ “ “ Red, 1-16 gr.	25 “	1 00 “
“ Morphia Sulphate, 1-10 gr.	37½ “	1 62½ “
“ “ “ 1-6 gr.	50 “	2 25 “
“ “ Valerianate, ⅛ gr.	62½ “	2 87½ “
“ Quinia Valerianate, ½ gr.	1 25 “	6 00 “
“ Silver Nitrate, ¼ gr.	37½ “	1 62½ “
“ Strychnia, 1-20 gr.	37½ “	1 62½ “
“ “ 1-40 gr.	37½ “	1 62½ “
“ Veratria Sulphate, 1-12 gr.	37½ “	1 62½ “

A liberal discount to the trade.

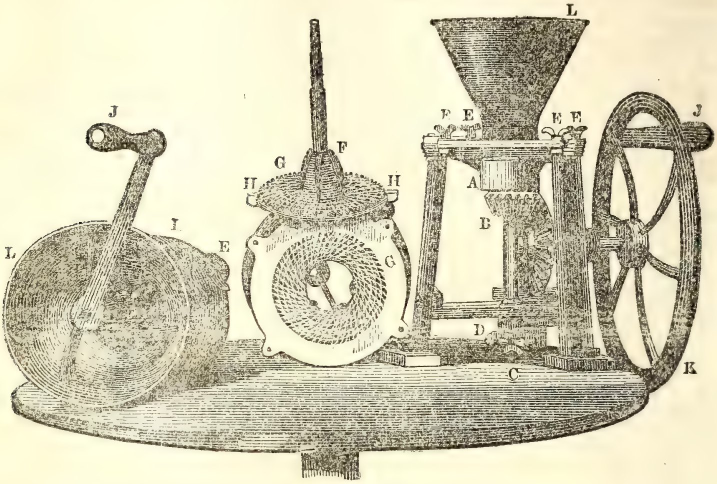
May 1861

N. SPENCER THOMAS'

DRUG AND SPICE MILLS.

We would call attention to our HAND MILL for Druggists' use; it is a most admirable Mill for preparing Drugs for Displacement, and by repeated running through and sifting, fine powders of many articles can be prepared with ease; it is arranged to screw on the edge of a counter or shelf, is easily taken apart for cleaning, and cannot get out of order; it is all iron. Weight about thirty pounds.

Price as above,	$6 00
" with gearing and fly wheel,	12 00



A. Spout for the delivery of the Ground Substance.
B. Cog-wheels for increasing speed of Runner.
C. Screw for regulating the fineness of the grinding.
D. Jam Nutt for holding Regulating Screw where it may be placed.
E. Thumb Screws for taking the Mill apart to clean.
F. Breaker at throat of Hopper for preparing the substance for the Grinding Teeth.
G. Pyramid Teeth for grinding. These teeth may be sharpened by grinding sand through the Mill repeatedly. Sand is also useful for cleaning.
H. Wings for carrying the Ground Substance to the Spout.
I. Lug for bolting the $6 Mill to counter, bench, or shelf; not on the $12 Mill.
J. Handle for turning the Mill.
K. Balance Wheel; not on $6 Mill.
L. Hopper.

We, the undersigned, having used N. Spencer Thomas' GEARED DRUG MILL, and found it much preferable to any mill heretofore used by us, would cheerfully recommend it to Druggists and Apothecaries for their purposes. It is more effective and easier taken apart for cleaning than any other mill we have seen; and we consider it indispensable in any Apothecary's Laboratory.

EDWARD B. GARRIGUES, N. E. cor. 10th & Coates Sts., Philad'a,
DAN'L L. WECKERLY, Germantown Rd. and Otter Sts. "
A. H. YARNALL, S. E. cor. 15th and Market Sts. "
J. R. ANGNEY, cor. Spruce and Fifth Sts. "
JOHN HORN, cor. Third and Brown Sts. "
G. W. RUEDI, Reading, Pennsylvania,
GEO. ROSS, Lebanon, "
A. N. CHAMBERLAIN, Elkhart, Indiana,
C. A. MORRIS & CO., York, Penna
WM. SAUNDERS, London, Canada West.

The GEARED MILLS have given entire satisfaction to all that have used them. They are made and sold by **THE UNION MANUFACTURING COMPANY,**

(N. SPENCER THOMAS, Superintendent,)

Manufacturers of Chemical and Pharmaceutical Preparations, Newmarket St. above Laurel,

PHILADELPHIA.

Always on hand, a full stock of MEDICINAL EXTRACTS, both fluid and solid—" made in vacuo." CONCENTRATED ECLECTIC MEDICINES, MACHINE-SPREAD PLASTERS, PLASTERS in rolls, SUGAR-COATED PILLS, SELECT POWDERS, PURE GROUND SPICES, BLUE MASS, MERCURIAL OINTMENT, GLYCERINE, OIL CLOVES, &c. &c.
All made in our own Laboratory, and quality guaranteed. July, 1863, 1 y.

WM. ELLIS & CO.,

DRUGGISTS AND CHEMISTS,

AT THE OLD STAND OF CHAS. ELLIS & CO.

No. 724 Market Sreet, Philadelphia.

The firm of Charles Ellis & Co., having been dissolved on the 1st of January, 1863, by mutual consent, the subscribers will continue the Drug business as heretofore in all its branches.

WM. ELLIS & CO.,
No. 724 Market Street,
Philadelphia.

Jan., 1863.

ALFRED B. TAYLOR

HAS REMOVED TO HIS

NEW AND COMMODIOUS STORE,

1015 CHESTNUT STREET,

And would respectfully solicit a continuation of the liberal patronage hitherto extended to him. Having increased accommodations and facilities for business, he is prepared to fill all orders with accuracy and despatch.

The following articles are specially commended to the notice of the Trade.

Taylor's Denticrete, an elegant and efficient Tooth Powder.

Taylor's Orilote, a delightfully fragrant Mouth Wash.

Taylor's Pectoral Mucilage, a standard remedy for Coughs, Colds, &c.

Taylor's Flavoring Extracts, Fifteen choice varieties.

Taylor's Diamond Cement, a very superior article.

Taylor's Improved Effervescent Solution of Citrate of Magnesia. Put up in small bottles. Each 8 oz. bottle contains a full purgative dose, and will keep good for 12 months.

Taylor's Elixir of Bark and Iron, prepared from the best Calisaya Bark, and containing in each ounce, eight grains of Pyrophosphate of Iron in solution.

Taylor's Aromatic Syrup of Blackberry, for Cholera Infantum, Diarrhœa, Dysentery, &c.

Taylor's Throat Tablets, composed of Cubebs, Alum and Rose Leaves.

Moulded Suppositories made to order, according to any desired formula; also Suppositers for sale; for description see page 202, Vol. xxxiii. of the American Journal of Pharmacy.

July, 1861.

PHARMACEUTIC GRANULES AND DRAGEES,

—SUGAR-COATED PILLS—

OF

GARNIER, LAMOUREUX & CO.

MEMBERS OF THE COLLEGE OF PHARMACY, OF PARIS.

These Granules and Dragrees are recognized, both in Europe and in the United States, as the most reliable way of dispensing valuable medicines. Physicians will find many worthless imitations, and they must be careful to see that the Pills dispensed by the Druggist are made by Messrs. GARNIER, LAMOREUX & Co., Members of the College of Pharmacy, Paris.

DRAGEES.

	U. S. P.	
Aloes and Myrrh	4	grains.
Compound Cathartic	3	"
" "	1½	"
Aloetic	4	"
Assafœtida	4	"
Aloes and Assafœtida	4	"
Dinner, Lady Webster's	3	"
Comp. Calomel, Plummer's	3	"
Blue Pills	3	"
Opium Pills	1	"
Calomel Pills	2	"
Opium et acet. Plumb. each	1	"
Extract of Rhatany	2	"
Compound Rhubarb	3	"
Compound Colocynth	3	"
Compound Squills	4	"
Dover Powders	3	"
Carbonate Iron, Vallet's formula.		
Carbonate of Manganese and Iron.		
Kermes	1-5	"
Santonine	½	"
Bi-Carbonate of Soda	4	"
Magnesia and Rhubarb, each	1	"
Meglin	1	"
Cynoglosse	1	"
Quevenne's Iron, reduced by Hydrogen	1	grain.
Proto-Iodide of Iron	1	"
Lactate of Iron	1	"
Sulphate of Quinine	1 and 2	"
Valerianate of Quinine	1	"
" " Zinc	1	"
" " Iron	1	"
Citrate of Iron and Quinine	2	"
" " Iron	2	"
Willow Charcoal	2	"
Diascordium	2	"
Anderson's Anti-bilious and Purgative	2	"
Extract of Gentian	2	"
Iodide of Potassium	2	"
Calcined Magnesia	2	"
Rhubarb	2	"
Ergot, powder covered with sugar as soon as pulverized	2	"
Phellandria Seed	2	"
Washed Sulphur	2	"
Sub-Nitrate of Bismuth	2	"
Tartrate of Potassa and Iron	2	"
Pyrophosphate of Iron	1	"
Podophyllin	1	"
Triplex Pills	3	"

GRANULES.

Of 1-50 *of a grain each.*

Aconitine,
Arsenious Acid,
Atropine,
Digitaline,
Morphine,
Strychnine,
Valerianate of Atropine,
Veratrine.

Of 1-5 *of a grain each.*

Tartar Emetic,
Codeine,
Conicine,
Extract of Belladonna,
Extract of Hyosciamus,
" " Ipecac,
" " Opium,
Proto-Iodide of Mercury.

Lupuline	½	grain.
Extract Nux Vomica	½	"
Veratrine	1-24	"
Sulphate of Morphine	⅛	"
Corrosive Sublimate	1-12	"
Nitrate of Silver	¼	"
Extract of Hyosciamus	½	"
Extract Rad. Aconite	¼	grain.
Emetine	¼	"
Iodide of Mercury	¼	"
Valerianate Morphine	⅛	"
Acetate Morphine	⅛	"
Digitaline	1-24	"
Strychnine	1-12	"

Colchicum (each granule equal to two drops of tincture.)

DRAGEES.

Copaiba, pure solidified,
Copaiba and Cubebs,
Copaiba, Cubebs and Citrate Iron,
Cubebs, pure,
Cubebs and Alum,
Cubebs, Rhatany and Iron.

On hand, for sale by

CHARLES ELLIS SON & CO.,

AGENTS

For the sale of GARNIER, LAMOREUX & Co's. "Pills and Granules."

Corner of Market and Seventh Streets, Philadelphia.

HANCE, GRIFFITH & CO.,

MANUFACTURING CHEMISTS AND PHARMACEUTISTS,

Office No. 509 North Street,

PHILADELPHIA,

Respectfully calls the attention of Druggists to the articles of their manufacture consisting in part, of

PURE MEDICINAL EXTRACTS, SOLID and FLUID, made from SELECTED DRUGS, and for sale in bulk or in 1 lb., ½ lb., and ¼ lb. packages.

PIL: HYDRARG: warranted of official strength, and of very superior consistence; ALSO, IN POWDER.

HYDRARG: CUM CRETA:

UNG: HYDRARG:, one half and one third mercury.

MACHINE SPREAD ADHESIVE PLASTER, very superior.

PLASTERS IN HALF POUND ROLLS, equal to the English.

MACHINE SPREAD PLASTERS of all kinds and sizes in use, of very superior quality, and spread on the finest lamb skin, put up in boxes of 1 dozen each.

GLYCERIN, (distilled) inodorous, anhydrous, and perfectly pure; for internal use.

CERATES, CONFECTIONS, OINTMENTS and SYRUPS, comprising all the varieties of the Pharmacopœia.

MEDICATED WATERS, all that are in use.

COLLODION AND CANTHARIDAL COLLODION, in bulk and by the dozen.

POWD: EXTRACTS, DOVER'S POWDERS, CASTILLON'S POWDERS, AROMATIC POWDER.

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Forty-fourth Session of the School of Pharmacy, 1864-65.

The Lectures in this institution will commence on Monday, October 3d, and terminate about the first of March. They will be held in the Hall of the College, Filbert street, on Mondays, Wednesdays, and Fridays, two lectures each evening at 7 and 8 o'clock.

The lectures on CHEMISTRY will embrace in a systematic view the laws, operations, and results of this science, and its relations to Pharmacy. The elements concerned in inorganic nature, and their compounds, will receive such notice as their relative importance in this respect demands; and will be illustrated by experiment, diagrams, specimens, and processes.

Organic chemistry will also receive its full share of attention, and all its compounds, possessing general or pharmaceutical interest will be brought under consideration in a similar manner.

The lectures on PHARMACY will treat, of the elementary operations required in the preparation of medicines; viz., weights, measures, and specific gravity, the management of heat, the manipulations in the processes of pulverization, solution, evaporation, distillation, crystallization, &c.; all illustrated by the most approved models, diagrams and apparatus.

The pharmaceutical preparations of organic drugs will be considered as follows; viz. The simple preparations of each drug will be noticed under the head of that drug, and each compound preparation under the head of or chief constituent. Each class of preparations, as tinctures, extracts, plasters, &c., will receive a general notice in its proper place. The classification of the subjects will be in groups founded on the nature of their chief constituents; these may be starch, gum, sugar, resin, volatile oil, fixed oil, tannin, alkaloids, etc., each group being prefaced by a general description of the principle or principles giving it name. The preparations of each drug will be preceded by such notice of its chemical constitution as will exhibit the kinds of treatment best calculated to extract and preserve its active portion.

The course will conclude with the processes for those inorganic chemicals which may be prepared by the apothecary himself, when desirable, without any reference to their systematic chemical relations.

The lectures on MATERIA MEDICA will be exclusively devoted to vegetable and animal substances, their origin, commercial history, characters, composition, and medical properties, together with their adulterations and the means of detection; and will be made practical and demonstrative by the exhibition of an extensive collection of the substances, their varieties and falsifications, aided by accurate drawings, and a full series of exotic and indigenous plants in their dried state.

Experiments illustrative of the proximate organic principles and modes of their detection, with the difference between genuine and spurious articles, will be introduced whenever deemed interesting or important.

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"He shall also be required to produce an original dissertation, or thesis, upon some subject of the materia medica, pharmacy, chemistry, or one of the branches of science immediately connected therewith, which shall be written with neatness and accuracy. The thesis, with the evidence of apprenticeship and diploma fee, shall be deposited with the senior professor of the school, on or before the twentieth of February, of the session in which the application shall be made. He must also be recommended in writing by the Committee of Examination and the Professors jointly, and if his application be finally approved of by the Board of Trustees, he shall receive the diploma of the college."

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ALFRED B. TAYLOR,
Secretary of the Board of Trustees,
1015 Chestnut St.

March, 1864.

THE

AMERICAN JOURNAL OF PHARMACY.

MAY, 1864.

AN ESSAY ON THE ACTIVE CONSTITUENTS OF ERGOT OF RYE.

By William T. Wenzell.

The greatly discordant views advanced by chemical writers on *Secale cornutum,* and a desire to investigate the proximate chemistry, of this degenerated cereal, have induced me to take up this apparently difficult subject. I have succeeded in isolating two vegetable nitrogenized alkaloids, the first of which I have provisionally denominated "Ecbolina," a name naturally suggesting itself by the ecbolic or womb contracting power peculiar to the crude drug, and which physiological action I believe to reside in that alkaloid. To the second alkaloid I have given the name of "Ergotina." It is further intended to show in this treatise, that "Propylamina," (the Secaline of Dr. Winkler,) exist in Ergot preformed, and that the acid peculiar to spurred rye, "Ergotic Acid," is volatile.

PRELIMINARY EXAMINATION.

A cold prepared aqueous solution of Ergot possesses an acid reaction. This reaction is, I believe to be, owing to the existence of an acid phosphate of magnesia, for on adding carbonate of baryta in excess, and shaking, the acid reaction is not removed. But on adding sufficient solution of potassa to neutralize the infusion, the basic phosphate of magnesia is precipitated, and by adding now sulphate of magnesia, an additional quantity of the phosphate is precipitated. The infusion is precipitated by acetate of lead, nitrate of silver, and barytic water, phosphates and ergotates of the respective bases being precipitated. Lime and potassa, the latter in greater quantity, were found. Phospho-molybdic acid and bichloride of mercury caused voluminous precipitates.

COURSE OF ANALYSIS.

A cold prepared aqueous infusion of Ergot was precipitated with acetate of lead. The filtrate, after being deprived of lead by sulphide of hydrogen, was treated with a mixture consisting of equal parts of saturated solutions of bichloride of mercury and bicarbonate of potassa, (bichloride of mercury does not by itself completely precipitate the infusion,) the well washed precipitate suspended in water, and then decomposed by passing sulphide of hydrogen through it. A portion of the filtrate, on being evaporated spontaneously, deposited minute, colorless, but well defined cubical crystals. On adding to another portion a solution of potassa in excess and heating, the pungent ammoniacal odor of propylamina were evolved. The solution responded to the test for chlorine. Phospho-molybdic acid gave a voluminous, flocculent, yellowish precipitate. On evaporating a portion of the solution, the solid residue gave on heating a sublimate of chloride of propylamina, accompanied by free hydrochloric acid, a considerable quantity of carbonaceous residue being left behind. To another portion of the solution was added potassa in excess, and heated until no more propylamina was given off; then, on acidulating the solution with hydrochloric acid and testing with phospho-molybdic acid, voluminous precipitates were obtained. These reactions clearly indicated the presence of another substance besides propylamina. After many fruitless attempts to separate the mixed bases fractional precipitations, as seemingly promising the best results, were tried.

For this purpose a cold prepared infusion of eight ounces of finely pulverized Ergot in one quart of water, after being neutralized by potassa was precipitated by chloride of barium, filtered, to the filtrate half an ounce of bicarbonae of potassa was added, and after its solution again filtered. To this filtrate four ounces of a saturated solution of bichloride of mercury was added, allowed to stand twelve hours, and the precipitate, which had then completely separated, collected on a filter, washed, suspended in water, decomposed by hydro-sulphuric acid and finally filtered.

The filtrate from the mercurious precipitate being similarly and successively treated as at first until no further precipitate was obtained, and each precipitate marked or numbered according to its succession. Of the six precipitates thus obtained, the first three, Nos. 1, 2 and 3, were greyish white and voluminous, and the remaining three, Nos. 4, 5 and 6, were nearly white and very dense. Solutions Nos. 1 and 2 each exhibited the color of sherry wine, and preserved an acid reaction, and on evaporation left no crystalline deposit. Potassa did not eliminate propylamina. The solution was found to consist of Ecbolina together with a small quantity of Ergotina, both in combination with hydrochloric acid.

Solution No. 3 was colored and reacted similarly to the preceding solutions. It turned quite dark during the evaporation. Liquor potassæ eliminated propylamina. No Ecbolina was detected. Ergotina was apparently the principal alkaloid contained therein.

Solutions Nos. 4, 5 and 6 consisted principally of chloride of propylamina and ergotina, accompanied by considerable free hydrochloric acid.

Seeing that even fractional precipitations, although successfully employed for the discovery of the two bases, did not prove entirely successful to separate them completely from each other, the following method has ultimately afforded more satisfactory means of isolating each alkaloid, and depends upon the property of Ergotina, of not being precipitable from acidulous solution by bichloride of mercury, and that propylamina is not precipitated by phospho-molybdic acid.

A cold prepared infusion of Ergot is to be precipitated with acetate of lead, the filtered solution treated with sulphide of hydrogen, the filtrate concentrated, and then finely powdered bichloride of mercury added and shaken after each addition, as long as a precipitate may be formed. This precipitate, after washing, decomposing with S. H., and filtering, will be found to contain the Ecbolina alone in the state of a chloride.

The filtrate from the precipitated chloride of mercury and Ecbolina is treated with phospho-molybdic acid as long as a precipitate may be obtained. The washed precipitate on being suspended in water with carbonate of baryta added to excess, and then digested with a gentle heat until the yellowish color of the mixture is replaced by a pure white, with the evolution of carbonic acid, The decomposition is now complete, and the filtered solution containing the alkaloid in its isolated state may be obtained solid by careful evaporation.

The Ecbolina was, by the following necessary and more complicated process, obtained in the state of isolation. The phospho-molybdic acid compound of Ecbolina cannot be decomposed like that of Ergotina, by simply heating the suspended precipitate with carbonate of baryta, and on evaporating the mixture to dryness in a water bath, according to the direction given by Dr. Sonnenschein, decomposition is indeed effected, but with nearly the entire loss of the alkaloid. The following method has succeeded in my hands but with a comparatively small loss.

The chloride of Ecbolina is to be treated with an excess of phosphate of silver and the chloride of silver, which is formed by the double decomposition with any excess of the phosphate removed by filtration. To the filtrate is to be added sufficient hydrate of lime, and the mixture well shaken until the phosphoric acid is entirely combined with the lime. The solution is then to be filtered from the precipitated phosphate of lime and any excess of lime, and for removing the lime still held in solution, a stream of carbonic acid is passed through it until litmus paper is reddened. On gently warming the solution, carbonate of lime is deposited and the gas expelled. The filtered solution now contains the alkaloid in the isolated condition, and may be obtained by careful evaporation at a low temperature in the solid state.

The alkaloids thus obtained appear uncrystallizable. They are left, when their solutions are evaporated, in the form of a brownish varnish coating the dish. They restore the color of reddened litmus, and turn turmeric paper brown. They are soluble in alcohol and water; sparingly soluble in wood spirit and insoluble in pure ether and chloroform. They form salts by neutralizing acids, which (the salts) are uncrystallizable and mostly deliquescent. On heating their solutions with liquor potassæ no ammonia is given, but by heating the solid alkaloids with soda lime, ammoniacal vapors were abundantly evolved. The taste of the alkaloids is slightly bitter. On igniting the solid alkaloids, each swelled up with the disengaging of an odor resembling that of burning flesh, leaving a carbonaceous residue which finally burned away without residue.

Ecbolina and its chloride exhibited the following reactions towards reagents:

Phospho-molybdic acid gave a flocculent, canary yellow precipitate.

Bichloride of mercury, a white precipitate.

Bichloride of platinum, a deep orange-colored amorphous precipitate.

Ter-chloride of gold, a light chocolate-colored amorphous precipitate.

Tannin, a whitish flocculent precipitate, soluble in alcohol.

Ioduretted iodide of potassium, a reddish-brown precipitate.

Iodo-hydrargyrate of potassium, picric acid, and ferro-cyanide of potassium, no change.

Tincture of iodine, a rusty brown precipitate.

Chlorine and ammonia caused after a time a whitish flocculent precipitate.

Bromine water, a canary-yellow precipitate.

Cyanide of potassium, a white precipitate.

In bringing the solid chloride in contact with concentrated sulphuric acid, solution was effected with effervescence, and the production of a dull blush-rose color.

Bichromate of potassa and sulphuric acid caused effervescence and solution, which ultimately turned green without intermediate play of colors.

Ferro-cyanide of potassium and sulphuric acid produced effervescence and solution, and subsequently a yellow precipitate.

Nitric acid dissolved the salt without change.

Reactions of Ergotina and its Chloride.

Bichloride of platinum, no precipitate.

Ter-chloride of gold, a drab-colored precipitate.

Phospho-molybdic acid, a voluminous yellowish precipitate.

Bichloride of mercury, a whitish precipitate, which is partially soluble in water.

Infusion of galls, or tannin, a whitish precipitate, and only in concentrated solutions.

On adding to the chloride in solution bi-chloride of platinum and an excess of etherized alcohol, a yellowish precipitate was obtained.

Cyanide of potassium occasioned no change.

The present investigation of ergotina and its behaviour has been less complete than its congener ecbolina, which was, in fact, owing to an accidental loss of a portion of the alkaloids.

Physiological action of the Alkaloids.

The experiments were made by comparison with the powdered drug. Unlike most authors, who believe that ergot has no obvious action on the male, I have come to the conclusion that it has as powerful an influence upon the spinal column of the male as it has upon the female. I find a half a grain of ecbolina to possess the same therapeutic action as thirty grains of ergot. From either the alkaloid or the powdered ergot in the doses mentioned, the following effects have been experienced upon myself:

The functions of the brain were excited to a species of intoxication, in which participated the muscular system, causing involuntary contractions of the muscles, soon followed by nausea, loss of appetite, a sense of weight and shooting pains through the head, stiffness and soreness of the muscles of the neck and extremities, a creeping sensation along the course of the spine; finally, a state of general relaxation and debility, soreness of the muscles, particularly those of the extremities, and a gnawing sensation in the stomach, with hunger. From the beginning to the end of the ergotic influence, which lasted about three hours, the pulse was not materially affected until the stage of debility supervened, when the pulse fell about four beats per minute. On doubling the dose, the only difference observed was, that the state of excitement was of shorter duration, but was followed by a greater amount of debility, greater weakness, with trembling of the extremities and pain through the chest.

Half a grain of chloride of ecbolina was given to a strong muscular man, weighing 180 pounds, and in perfect health. He complained of shooting pains in the head, nausea, frequent calls at micturation, pain and tightness across the chest, followed by a reduction of the pulse, depression of the mind, a dull pain with a sense of pressure above the orbits, and general debility.

Experiments instituted with Ergotina in a physiological point of view were less complete, owing to the loss previously mentioned. From the effect produced upon myself, I believe it to be less active than its congener, and although capable of causing some cerebral excitement, and a reduction of the pulse, I did not observe the same specific action upon the spinal column and muscular system.

I placed into the hands of a physician some months ago a solution of chloride of ecbolina, to test its medicinal qualities in uterine hemorrhages and parturitions, but have not heard from him since.*

It must be observed that the yield of alkaloid does not correspond with the amount contained in the drug. The alkaloids are very prone to change and decomposition. On decomposing the double salt of mercury and the alkaloids with sulphide of hydrogen, quite a loss is then sustained by the formation of sulphuret of allyle at the expense of the alkaloids.

Chloride of propylamin has been obtained direct from the fractional precipitates Nos. 4, 5 and 6, by passing the solutions through prepared aurinal charcoal, until the removal of the ergotina is effected, the solutions evaporated to dryness and exhausted with hot absolute alcohol, will, on evaporation, deposit chloride of propylamin, which is readily recognized by the hexagonal form of its prisms, and when evaporated with bichloride of platinum, the octohedral yelk-colored double chloride

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* Since this article was put into type the following has been received from the author :—

"I have seen the physician into whose hands I placed the chloride of ecbolina. He tells me that he used it in several cases of uterine hæmorrhage, with satisfactory results, but says that, from the symptoms produced in the doses I had directed him to give, he was compelled to lay it aside, from the energetic and poisonous action it evinced, causing great nausea with distressing vomiting and intense headache. He thinks the ecbolina to be a powerful agent."—Ed. Am. Journ. Pharm.

was deposited, which, on ignition, left a percentage of platinum agreeing with that of propylamina.

To determine the existence or non-existence of a volatile organic alkaloid, aside from propylamina, was next made the subject of investigation. An infusion of ergot, made alkaline with potassa, was distilled, and the distillate received in water acidulated with hydrochloric acid. The distillate gave no precipitate with phospho-molybdic acid and bichloride of mercury. It possessed an odor somewhat similar to that of ergot, which was not rendered more distinct by making the liquid alkaline. On heating, vapors of propylamina were given off. On evaporation, the residue consisted of discolored chloride of propylamina. It is therefore certain the propylamina is the only volatile base contained in ergot.

ERGOTIC ACID.

A cold prepared aqueous infusion of Ergot was strongly acidulated with sulphuric acid and distilled. The distillate was nearly colorless, possessed a strong pungent odor and a decided acid reaction. It reduced proto-nitrate of mercury and nitrate of silver; when heated, alcohol and sulphuric acid. Formic ether was detected.* On heating gently the formic acid was dissipated. The acid solution was not precipitated by acetate of lead, nitrate of silver, and chloride of barium. When neutralized with ammonia, the reagents then readily formed precipitates soluble in dilute nitric acid. Chloride of barium gave a precipitate which dissolved in nitric acid, with the subsequent formation of a heavy granular precipitate which, when microscopically examined, was found to consist of colorless transparent hexagonal, and triangular plates. This baryta salt is characterized by its insolubility in concentrated nitric and hydrochloric acids. As the precipitated ergotate of baryta is dissolved by hydrochloric acid without the formation of the crystalline baryta salt, and as nitric acid alone produces that change with the evolution of some gaseous body which escapes with effervescence (not nitrous acid) during the deposition of the salt, it is possible that one atom of hy-

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*To determine whether the formic acid here obtained pre-existed, or had been obtained by decomposition by the means of sulphuric acid, an infusion of the drug was distilled with tartaric acid, but with negative results.

drogen may be replaced by NO_4 forming a new acid, a nitro-acid. On decomposing this barytic salt carefully with sulphuric acid, the liberated acid was found to possess a stronger acid reaction than ergotic acid. It decomposes alkaline and earthy carbonates with effervescence, and forms crystallizable salts with them which ergotic acid does not. The salt of potassa crystallizes in rhombic prisms, the soda salt in cubes, and the salt of lime in oblique rhombic prisms. On evaporating a solution of ergotic acid in water, the acid volatilizes with the vaporized water.

Ergotic acid has been hitherto considered to be fungic acid. As the latter acid is not volatile and can be evaporated to a syrupy consistence without loss, I do not believe there is any foundation for it. It is true that, like fungic acid, the free ergotic acid is not precipitated by salts of baryta and silver unless they are in combination with bases.

In order to determine as near as possible the manner in which the acids and bases of ergot are combined, an infusion of the drug was evaporated to one half and filtered to separate the albuminous matter which had coagulated. It was then carefully evaporated to a syrupy consistence and mixed with 95° alcohol in large excess. The precipitate, after washing with alcohol and solution in water, was found to possess an acid reaction. On the addition of ammonia in excess, the basic phosphate of ammonia and magnesia subsided, and on adding now sulphate of magnesia, more of the precipitate fell. Potassa, ergotic acid, and the alkaloids were found, but no propylamina. It was evident that the precipitate, insoluble in alcohol, contained its constituents in the following arrangement:

Ergotates of the alkaloids,
" " potassa.
Acid phosphate of magnesia.

The alcoholic solution was evaporated to expel the alcohol and diluted with water; on adding ammonia no precipitate appeared, but adding also sulphate of magnesia, the triple phosphate at once appeared, indicating the presence of phosphoric acid. Propylamina was found, also ergotic acid, the alkaloids, potassa, chlorine and lime. It is evident that the constituents of the alcoholic extraction are thus arranged:

Ergotates of the alkaloids.
Phosphate of propylamina.
Chloride of potassium.
" " calcium.

On subjecting the solid extract of the infusion to a destructive distillation, the first part which passed over possessed an acid reaction (ergotic acid), then followed white dense vapors containing chloride of propylamina and some free ammonia. The vapors possessed the smell of burning flesh. At the moment when the white sublimate ceased, the carbonaceous residue possessed a strong acid reaction, caused by the acid phosphate. After strong ignition the acid reaction had disappeared. On exhausting the residue with boiling water, the solution contained phosphate of potassa and chloride of potassium. That portion of the carbonaceous residue insoluble in water, was treated with hot water acidulated with hydrochloric acid; analysis gave phosphate of magnesia and phosphate of lime.

This last experiment was instituted for the purpose of confirming the previous experiments. To take a summary view of this subject the following resumé may perhaps be necessary to render it sufficiently clear.

The constituents which I have found in the aqueous infusion of ergot are, according to my investigations,

Ergotate of ecbolina.
" " ergotina.
" " potassa.
Acid phosphate of magnesia.
Phosphate of propylamina.
Chloride of potassium.
" " calcium.

When the extract is heated the ergotates of the alkaloids are entirely decomposed. The acid phosphate of magnesia, in reacting upon the ergotate of potassa, fixes the potassa, setting the ergotic acid free, which sublimes. The phosphate of propylamina and chloride of potassium interchange their elements with the formation of phosphate of potassa and chloride of propylamina, the latter subliming. On ignition the chloride of calcium is decomposed, the acid phosphate also fixing the lime.

La Crosse, Wisconsin, April 4th, 1864.

ON CAULOPHYLLUM THALICTROIDES, (BLUE COHOSH).

By ALBERT E. EBERT, of Chicago.

(An Inaugural Essay, presented to the Philadelphia College of Pharmacy, 1864.)

This plant, likewise known as Squaw root, Pappoose root, is indigenous to the United States, growing in low moist grounds near running streams, bearing berries of a dark blue color when ripe, from which it derives its name "Blue" Cohosh. The root is the part used in medicine, being principally employed by the so-called Eclectic practitioners. The root consists of a thick irregular bent or contorted body, or caudex, from a quarter of an inch to half an inch in thickness, often several inches in length and furnished with many slender radicles from four to eight inches long. The color is externally yellowish brown, internally whitish, with a light brown pith running through the centre of the root. The taste is at first sweetish bitter, but after chewing, it becomes somewhat acrid, leaving a peculiar irritant sensation on the fauces.

The root, as usually met with in the shops, comes in the pressed state from the Shakers. Not having facilities for collecting sufficient of the root for this series of experiments, I had to resort to the drug as found in the market.

A quantity was reduced to a coarse powder, and macerated 48 hours in water. The whole was then transferred to a distillatory apparatus and distilled. The distillate obtained was neutral to test-paper, not milky or fluorescent, had no perceptible odor, and but a slight taste of the root. This would indicate the absence of a volatile oil.

Another portion of the powdered root was exhausted with cold water. This infusion had a dark brown color, and the peculiar taste of the root. When first prepared, it was perfectly limpid, but soon became turbid on standing. A portion of this infusion, when agitated with a weak solution of corrosive chloride of mercury, let fall a copious precipitate.

With another portion a strong infusion of nutgalls produced a curdy precipitate, and another portion, when boiled and allowed to cool, deposited a flocculent precipitate, these tests indicating the presence of *Albumen*. A watery decoction was next prepared from the bruised root, filtered and concentrated, and precipitated, by the addition of strong alcohol. The precipitate obtained was dissolved in water, and tested with a solution of subacetate of lead, which caused a white gelatinous deposite; another portion of this watery solution gave, on the addition of alcohol, a white precipitate, these tests indicating the presence of *Gum.* A portion of this watery decoction, when tested with an aqueous solution of iodine, produced the characteristic blue color, thus proving the presence of *Starch.* No tannic or gallic acid was detected on carefully adding the solution of gelatin and a persalt of iron. The liquid from which the gum was separated by the addition of alcohol, was now freed from the latter by evaporating. I now added to the liquid a solution of the neutral acetate of lead. The precipitate thus produced was collected and suspended in sufficient water, and hydro-sulphuric acid in excess was passed through it. The precipitate thus thrown down was collected on a filter, and, after heating the filtrate to drive off the hydro-sulphuric acid, it was tested as follows: Chloride of barium produced a cloudiness, seeming to indicate sulphuric acid, which may have been an accidental product of the foregoing experiment. Phosphoric acid was shown by a dilute solution of nitrate of silver, producing a yellow precipitate, being again soluble in an excess of ammonia. The sulphuret of lead obtained by decomposing the just mentioned lead precipitate by hydrosulphuric acid, was boiled with water and filtered, yielding a little colored extractive matter.

Alcohol, sp. gr. ·835, was now added to the sulphuret of lead and raised to boiling point, and filtered while hot; when shortly, on cooling, it deposited *crystals* of yellowish tint. This crystalline body was not soluble in cold water, or in water acidulated by sulphuric acid, neither in a solution of caustic potassa or soda, but was slightly soluble in cold and very soluble in boiling alcohol, also soluble in ether and chloroform. The reaction with reddened litmus paper was slightly alkaline. On heating the crystals on platina foil, they first fused, giving off vapors of water and puffed up in a spongy coal, combustion being effected without residue. The crystals when placed under the microscope, presented the prismatic crystalline form with oblique terminations. The yield of the crop being very small, I was unable to pursue my investigations upon them any further.

The solution separated by filtration from the precipitate, produced by the neutral acetate of lead, was now mixed with a solution of subacetate of lead, as long as thereby any deposit was effected. This precipitate was likewise collected on a filter and washed with water. The filtrate was freed from lead contained therein by passing through the solution hydro-sulphuric acid in excess. The produced sulphuret of lead was then separated by filtration, and the hydro-sulphuric acid expelled from the filtrate by heating and evaporating to a syrupy consistence. This evaporated residue was mixed with alcohol, sp. gr. ·835, and agitated, whereby a dark brown extractive mass was separated. The alcoholic liquid, after being separated from this extractive mass, was mixed with an equal volume of ether and agitated, when again a light brownish body was separated. I tested this latter body by Trommer's test for sugar, but with a negative result. The ethereal solution yielded, on evaporating spontaneously, crystals similar to those already described.

Having used up all my stock of root in the above mentioned experiments, and being somewhat encouraged by the isolation of a crystalline body, also having found its ready solubility in boiling alcohol, I had no doubt now but that I should be able to obtain it in large enough quantities to determine its true character, but in this I was disappointed. Having procured 10lbs of the root in the pressed state, put up by the Shakers, New Lebanon, N. Y., and wishing to dry it to facilitate its reduction to powder, I observed, in garbling it, that it contained portions of a root of a yellow color, which, on close examination, proved to be the root of Hydrastis Canadensis; this existing in the proportion of about one-third of the whole quantity. Thinking that there might have been an accidental admixture I returned it, but was somewhat surprised that I could not find a single pound in the market, without more or less of this admixture. Is this accidental or intentional on the part of the parties who put up and send this mixed drug into the market? This is one of the objections to the buying and selling of herbs and roots in this pressed and wrapped condition. Through inexperience in the precaution necessary before an analysis, I had neglected to examine the first lot of root I used, and my obtaining a crystalline body in the before-mentioned experiments may have been due to this mixture of the two roots, as in all my succeeding experiments, with a pure picked root, I have been unable to obtain this crystalline body.

Experiments with the picked Root.

A portion of the finely powdered root was exhausted with boiling alcohol, sp. gr. ·835. The tincture thus obtained was evaporated by means of a water-bath to a syrupy consistence; a small quantity of alcohol, sp. gr. ·815, was added, and this solution poured into a large bulk of water. This admixture caused a precipitate, which was collected on a filter, well washed with water and dried, yielding nearly five troy ounces from forty-two troy-ounces of the root. This constitutes the *Caulophyllin* of the eclectics. A portion of this, dried and powdered, was agitated with ether, the insoluble portion separated by filtration, and re-dissolved in alcohol, sp. gr. ·835. The alcoholic solution thus obtained was agitated with purified animal charcoal, filtered, and allowed to evaporate spontaneously. The resin thus obtained was of a light brown color, soluble in alkaline solutions, from which it was precipitated on the addition of acids. When heated on platina foil it first was found to melt, then to take fire and burn, emitting considerable smoke. This indicates a *resin insoluble in ether.* The ethereal solution, on being subjected to spontaneous evaporation, yielded a resinous body of a greenish yellow color, and of the consistency of wax, soluble in alkaline solutions, and precipitated on the addition of acids. Another portion of this ethereal solution was agitated with animal charcoal until it became colorless. After filtering and evaporating spontaneously it yielded the same resinous, waxy body as above mentioned, with the exception of being nearly white with a yellowish tinge; both these bodies when heated burn, emitting considerable smoke. This would prove the presence of a *resin soluble in ether.* Both the alcoholic and ethereal resins have the peculiar taste of the root. On evaporating the watery liquid from which the resinous bodies were precipitated, it yielded an extractive body of a bitter and acrid taste, similar to that caused by chewing the root, soluble in alcohol and water; when shaken with the latter it produced a very thick and persistent froth. This led me to investigate it with reference to the presence of a body analogous to saponin. I dissolved this extractive body in diluted alcohol, and passed it through animal charcoal; this liquid, when agitated with ether, let fall a fawn-colored precipitate. The liquid was decanted, the precipitate was washed and dried, yielding, when powdered, a grayish white inodorous body, very irritant to the nostrils, producing sneezing. The taste is sweetish acrid bitter, leaving a tingling sensation in the mouth and fauces. It is entirely dissipated on the application of red heat.

This substance is freely soluble in diluted and strong alcohol, also freely soluble in hot water, with which it produces a very thick froth on agitation. Its aqueous solution reddens litmus paper. It is soluble in alkaline solutions, as of ammonia, potassa and soda. It is precipitated from its watery solution both by neutral and subacetate of lead; by the former a light, and by the latter a dense flocculent precipitate; with a solution of binitrate of mercury, and also, with a solution of terchloride of gold a slight precipitate. When heated with sulphuric acid it first assumes a rose, then a purple, and finally a violet color. On heating with nitric acid, it assumes a straw-yellow color, and on the addition of water, a flocculent matter separates and rises to the top. When heated with hydrochloric acid it is not altered in color, simply depositing a flocculent precipitate, which, when added to boiling water, is but partially soluble, this again being deposited on cooling. From these experiments it appears that this root contains a substance similar to *Saponin*.

While making the above series of experiments, my attention was called to a paper by Prof. Ferdinand F. Mayer, published in the March number of the *American Journal of Pharmacy*, 1863, wherein he says, " that if the alcoholic tincture of this rhizoma was left to spontaneous evaporation, a deposit of a white granular substance was obtained. This deposit, when washed with diluted acid, dissolved a colorless alkaloid and soluble extractive, and then with some water remains as a grayish white powder, which, for the greater part consists of *Saponin*."

I do not assume to contradict Prof. Mayer, although, while fully corroborating his statement in regard to a body analogous to saponin, I was wholly unable to obtain a crystalline body when manipulating with the greatest care with a pure article of the root; and it is possible that Prof. Mayer, like myself, was deceived by employing an impure sample of the drug. Having made a watery decoction of six pounds of the root, I evaporated this to an extractive consistence, and extracted this with boiling alcohol, ſp. gr. ·835. This was freed from the alcohol by vaporization, and again dissolved in sufficient water, and the following processes for alkaloids were tried. The process with acetate and subacetate of lead, that with oxide of lead, with lime, and with magnesia, in neither case could I obtain a crystalline body by carefully following the processes laid down.

Inorganic Constituents.

Eight hundred grains of the root when incinerated, yielded twenty grains of a light colored ash.

A portion of this ash was treated with boiling water; the solution was filtered and tartaric acid added in excess, when a white crystalline precipitate of bitartrate of potassa was obtained.

Another portion of the solution, when tested with nitrate of silver, produced a curdy white precipitate, which blackened on exposure to light and which was entirely soluble in aqua ammonia, proving the presence of a chloride.

Another portion of the solution gave, with chloride of barium, a white precipitate, which was not soluble in boiling nitric acid, proving the presence of sulphuric acid. The insoluble portion of the ash was treated with hydrochloric acid, in which it was partly soluble. A portion of this acid solution, gave, with ferrocyanide of potassium, a blue color, indicating the presence of a salt of sesquioxide of iron.

On the addition of phosphate of soda and ammonia to another portion, a white precipitate was obtained, indicating the presence of magnesia.

Another portion of the acid solution, when neutralized with ammonia, gave, with a solution of sulphate of magnesia, a white precipitate, this being again soluble in nitric acid, proving the presence of phosphoric acid.

With the remainder of the solution, oxalate of ammonia produced a white precipitate, thus indicating the presence of *lime.* The insoluble portion of the ash was well washed with distilled water and then boiled with a solution of potassa; it was then filtered, and yielded, on the addition of diluted acids, a white precipitate, which on drying, was found to be insoluble in water and diluted acids, thus indicating the presence of *Silica.*

From the foregoing experiments, the organic constituents of the root of Caulophyllum thalictroides are: 1st, Albumen; 2d, Gum; 3d, Starch; 4th, Phosphoric acid; 5th, Extractive; 6th, Resin, soluble in alcohol and insoluble in ether; 7th, Resin, soluble in alcohol and ether; 8th, greenish yellow coloring matter; 9th, a body analogous to *saponin.*

The inorganic constituents are: Salts of potassa, magnesia, lime, iron, and silica.

Philadelphia, February, 1864.

REMARKS ON SOME PREPARATIONS OF THE U. S. PHARMACOPŒIA, 1860.

By William Procter, Jr.

This work has now been in the hands of American pharmaceutists for many months and it is presumed that every pharmaceutist, who makes an effort to keep up with the progress of his art, has more or less informed himself of its contents. On a former occasion it was hinted that notices of some of the preparations would be brought forward, from time to time, and it is now proposed to begin them. Every Apothecary should carefully read and fix in his memory the important preliminary notices which refer to weights, measures, temperature, percolation and powders. Indeed so highly important is it to fully comprehend the theory of the *process of extraction by percolation*, as it is intended by the framers of the Pharmacopœia, and to skilfully apply the principles involved in practice, that percolation, and the preparation of powders it requires, may be considered as the fundamental processes of galenical pharmacy. The beginner should follow closely the directions of the Pharmacopœia, whatever may be his preconceived notions, bearing in mind that it is only on this condition that the formulas of the work can be fairly tested and their merit determined.

ACETA.—*Acetum Lobeliæ.* The first notice of this preparation will be found at page 109, vol. 14th, of this Journal, July 1842; as there suggested the proportion is four ounces to a pint and a half. In the Pharmacopœia it is made four ounces to two pints, to correspond with the vinegars of Blood-root and of Squills. It is a dark reddish-brown liquid with an acidulous acrid taste. The lobelia is directed to be in moderately coarse powder, which, if uniformly prepared, is the most appropriate degree of division for the menstruum used.

Acetum Sanguinariæ. Vinegar of Blood-root has long been known as an unofficinal popular preparation for ringworm, especially when a portion of verdigris is dissolved in it. The first notice of it in this Journal, is as a basis for Syrup of Sanguinaria by T. S. Wiegand, at page 108, vol. 26th, which preparation is in the ratio of 4 ounces to the pint. As prepared by the Pharmacopœia it is two troy ounces to the pint of diluted acetic acid, and has at first a deep red color which becomes lighter on standing, owing to the deposition of coloring matter, which appears to be independent of that due to the acetate of sanguinarina.

Acidum Hydriodicum Dilutum. In this process hydrosulphuric acid gas is passed through a mixture of powdered iodine and water, until a clear solution is obtained. The direction to treat thirty grains of iodine separately is to afford the means of getting the iodine into solution by aid of a portion of hydriodic acid. When this is not done, the sulphur, which, as it cedes its hydrogen to the iodine, separates at first as a powder, assumes the form of lumps, enclosing portions of the undissolved iodine, which are either overlooked or require to be liberated by breaking down the lumps of sulphur.

The officinal solution, though colorless when recent, becomes brown, from escape of hydrogen and the formation of hydriodous acid, by keeping in contact with the air. Iodine is gradually deposited in crystals, hence the solution, immediately after being made and yet warm, should be introduced in bottles which it nearly fills and securely closed.

Diluted nitro-muriatic acid. The object of this preparation is to facilitate the dispensing and administration of the acid, which in its undiluted state has been the cause of unpleasant accidents, from the sudden escape of enclosed chlorine, when the bottles are opened for use. The necessity of retaining the undiluted acid is not very apparent, unless it had been used as a step in the process for the diluted acid, which it has not.

Acidum Phosphoricum Dilutum. This process, which is analogous to that of the late London Pharmacopœia, in its results differs in the apparatus used, and is essentially the process of Messrs. Andrews & Thompson, of Baltimore, published in the Maryland Journal and Transactions, for Sept. 1, 1858, and republished in this Journal, vol. xxx, page 525. The merit of the process consists in the use of a porcelain capsule, in lieu of a glass retort. The inverted dish, recommended by Messrs. A. & T., is very properly substituted by a glass funnel in the officinal process, which, while equally safe, renders the process observable, and in fact converts the capsule, for the time, into a glass matrass.

In the second process, wherein the solution is made from glacial phosphoric acid, the addition of nitric acid is to facilitate the conversion of the glacial into tribasic phosphoric acid, as recommended by Mr. Maisch, (see vol. xxxiii. page 385, of Amer. Jour. Pharm.) and which is much more slowly effected by ebullition alone.

The Diluted Mineral Acids. It will be observed that the strength of the diluted muriatic, nitric and sulphuric acids, has been somewhat changed; all of them are slightly weakened. The change in strength was caused by employing weight instead of measure for the acids, and by making each process yield just a pint. According to Mr. A. B. Taylor, the ratio of the old and new diluted acids is as follows:

	Ph. 1850.	Ph. 1860.
Diluted muriatic acid,	2114 grs.	1920 grs. per pint.
Diluted nitric acid,	1479 "	1440 " " "

Diluted Sulphuric acid, ratio not stated but nearly equal.

Acidum Sulphurosum. This formula, which is nearly that in Wittstein's Pharmaceutical Chemistry, I have frequently employed and found to be practicable, and easily conducted in the shop on the scale of the Pharmacopœia. All that is needful is to have the luting tight to prevent the annoyance arising from the escape of the gas. Common putty will answer for all the joints except that at the matrass, which should be made of linseed meal and water, unless the cork is very close, which is not always the case, under pressure.

Aqueous Sulphurous Acid thus prepared should be introduced into the bottles, so as to nearly fill them, and secured by sealing wax. The direction to keep in a cool place is needful on account of expansion. I have found no difficulty in keeping it for six months in bottles with corks well sealed, but access of air results in the escape of some of the gas, and the conversion of the remainder into sulphuric acid. In the Pharmacopœia note to this preparation the last sentence refers to this tendency to change into sulphuric acid, which would be detected by the test.

Acidum Valerianicum. The process for this acid is that of Benjamin J. Crew, published originally in the Amer. Jour. Pharm., vol. xxxii. page 109, in describing his process for obtaining crystallized valerianate of ammonia. The manipulation is based upon the facts that concentrated valerianic acid is insoluble in a saturated solution of sulphate of soda, and in strong sulphuric acid, which, on the contrary, abstracts from it a part of the water present. In the subsequent distillation the aqueous portion comes over first and is rejected, or after dehydration by SO_3 is again returned to the retort.

The only pharmacopœial use of this acid is in the preparation of the valerianates of ammonia and quinia, but there is no doubt it will become useful for the preparation of other salts, as that of morphia, and that it will be used in a free state in mixtures. It is probable that commercial valerianic acid is often contaminated with substances derived from the fusel oil from which it is produced, but care in its preparation will avoid this fault. I am not aware that the physiological and therapeutic action of free valerianic acid has been specially studied though it seems worthy of attention.

(To be continued.)

GLEANINGS FROM THE FOREIGN JOURNALS.

Opiated Syrup of Lactucarium. In a paper published in *Jour. de chimie médicale*, Jan., 1864, M. Aubergier, among other information in regard to syrup of lactucarium, gives the following recipe for a syrup of opium and lactucarium under the title "*Sirop de Lactucarium opiacé.*"

Take of	Alcoholic extract of Lactucarium,	150 centigrs.	(23 grs.)
	Extract of Opium	75 “	(11·5 grs.)
	White Sugar, No. 1,	2000 grms.	(64 troy oz.)
	Orange flower water,	40 “	(10 drs.)
	Distilled water,	9·05	($2\frac{1}{3}$ drs.)
	Citric acid,	75 centigrs.	($11\frac{1}{2}$grs.)

Dissolve the extract of opium in the orange-flower water and filter. On the other hand exhaust the alcoholic extract of lactucarium with the distilled water boiling, allow it to cool and filter through paper. Dissolve the sugar in the latter solution and sufficient water (34 fd. ozs.) to make a syrup, with the aid of heat, add the citric acid and clarify with white of egg, removing the scums as they arise, evaporate to 30° B., boiling then again; evaporate the syrup until it loses as much weight as equals the solution of extract of opium, which is then added and the syrup strained.

Each spoonful of this syrup contains the part soluble in water of one centigramme ($\frac{1}{6}$th gr.) of extract of lactucarium, and half a centigramme ($\frac{1}{12}$th gr.) of extract of opium.

Emulsion of Pumpkin seed and Male ferm for Tænia.

Take of	Pumpkin seed,	40 grammes	(617 grains.)
	Sugar,	30 “	(416 “)
	Oleo resin of male ferm	4 to 8 “	(61 to 122 grs.)
	Water,	150 “	(5 fluidounces.)

Bruise the seed in a marble mortar, with a fourth part of the sugar, add about half a fluidounce of water and, when a homogeneous paste is obtained, add the oleoresin, mix and dilute gradually with the remainder of the vehicle. This emulsion should not be strained, and when the preparation has been well made, that is to say when the seed have been thoroughly bruised, the patient can take the emulsion without difficulty.

This potion should be taken early in the morning, at four times, at intervals of a quarter of an hour. The only precaution recommended is to shake the vial each time it is used.—*Bull. Thérap. et Jour. de Chim. Med.*

Mercurialia. According to M. Reichardt, when the leaves or seed of *Mercurialis annua* are submitted to distillation, with an excess of quick lime, a volatile alkaloid, having a disagreeable odor, is disengaged. The vapors are collected in a receiver containing diluted sulphuric acid and the liquid evaporated on a water-bath, by which a residue is obtained, consisting of sulphate of ammonia, brown, resinous, matter, and a salt of an alkaloid base, which the author has named *mercurialin.*

The whole residue is extracted with absolute alcohol, which dissolves only the new sulphate, after driving off the alcohol the sulphate is distilled with caustic potassa; the product is ammoniacal, which is rectified in a current of hydrogen on a chloride of calcium bath, when the new alkaloid is obtained in the state of an oily liquid which is deprived of adherent ammonia by the vacuum.

This alkaloid is very poisonous; it has not been analysed. Its characters are as follows: an oily liquid of a disagreeable odor and an alkaloid reaction, transformed by the action of the air into a resin of butyraceous consistence. Its boiling point is 284° F. It absorbs carbonic acid and yields a carbonate very soluble in alcohol.

The chloride is also soluble in alcohol; the bichloride of platina precipitates it, only after a time, in the presence of strong alcohol and in nacreous crystals. The oxalate is very soluble in water and much less so in alcohol.

Mercurialia is very hygroscopic, and by becoming hydrated loses some of its disagreeable odor.—*Jour. de Chim. Médicale.*

Aniline in Varnishes. When an alcoholic solution of aniline is evaporated upon a glass plate, there remains a thin transparent coating of aniline, which, by reflected light, appears as a metallic green iridescence, but by transmitted light of a blue or violet color, according to the shade of aniline used. As aniline is soluble also in spirit varnishes, it is proposed to prepare such a blue transparent varnish for coating bottles, used for the preparation of substances easily affected by light.—*N. Jahrb. Ph.* xx. 44.

ON THE ACTIVE PRINCIPLES OF THE STRYCHNACEÆ.

By Ferdinamd F. Mayer, of New York.

In taking up this subject various points have presented themselves for consideration, several of which are to be mentioned now, while others must necessarily, and by our leave, remain over for future consideration. I have thought it best to confine myself at present to some remarks on the knowledge we possess of the active principles of the Strychnaceæ; then, as to their quantitative determination pure, and in the preparations officinal in the U. S. Pharmacopœia; and though leaving the subject incomplete, these contributions are submitted as answering the main points contained in the query.

The literature, medicinal, pharmaceutical, and chemical, of the drugs derived from this family, is by no means as extensive as that of opium and of bark, nor is our knowledge of their active principles as accurate as might be expected or desired.

These active principles are supposed to be represented by two or three alkaloids, which, named in the order of discovery, are strychnia, brucia and igasuria. Pelletier and Caventou, in 1818, discovered in the Ignatia seed a bitter alkaloid which they named *Vauqueline*, in honor of the great pharmaceutist; this name Bucher, sen., considered inappropriate, and proposed in place of it, *Strychnin*, which it thenceforth retained; *Tetanin* was suggested for it by Magendie. Pelletier and Caventou likewise found this alkaloid in nux vomica and bois de couleuvre, snakewood, lignum colubrinum from Strychnos colubrinum. Shortly after they noticed the existence of a different alkaloid in the bark of *Strychnos nux vomica*, then known as false angustura bark, and supposed to be that of *Brucea anti-dysenterica*; hence its name of Brucia, in place of which, Geiger once proposed Caniramin (*canis*, dog, *ira*, rage.) Desnoix, lastly, noticed a crystalline deposite in the alkaline liquor from which strychnia and brucia had been precipitated, and called the same *Igasurin.* Schützenberger afterwards confirmed that this alkaloid concurred in many properties with brucia, but found it was itself a mixture of no less than nine different bases, varying slightly in the per centage of carbon, hydrogen and oxygen, and water of crystallisation, as well as in solubility; the same chemist had before noticed similar variations in the composition of strychnia. It is readily perceived, from the properties ascribed to strychnia especially, and brucia, by Pelletier and Caventou, Pettenkofer, Geiger and Merck, that these chemists operated with mixtures of the alkaloids. For this reason statements as to the quantity of the respective alkaloids to be found in either nux vomica or ignatia seed, made previous to Wittstock, are not to be relied on. The latter observer states that 10 ounces of nux vomica yield 12½ grains of strychnia and 31¼ of brucia, while according to Gieseler, 10 ounces of ignatia seed yield 72 grains of strychnia. Pelletier and Henry obtained between 40 and 50 grains of this impure strychnia from 10 ounces of nux vomica.

These discrepancies find their explanation in the peculiar character of that portion of the alkaloids which is not readily precipitated by alkalies.

The alkaloid which received the name of strychnia is recorded as scarcely soluble in water and alkalies. Planta, whose observations will in most cases be found at least as trustworthy as those of others who are much more frequently quoted, never uses the expression "insoluble," in such cases, but says *not perceptibly soluble*, and this, as a matter of course, is the case with all alkaloids, since none of them are ever completely insoluble in water or completely precipitated by alkalies proper. Brucia was called originally the precipitate which falls down from mother liquors of crystallisations of strychnia by the addition of more soluble alkali, and igasuria that which finally deposited from the alkaline solution on standing. With the exception of Planta, who mentions the difficulty with which brucia is precipitated by ammonia, I find on record but one instance in which the circumstance is mentioned which enables me, without entering more closely into a consideration of the subject, to give a rapid as well as accurate method for determining strychnia in the presence of the other alkaloids; it is this, in a paper published by that excellent chemist, Dr. F. L. Winckler, of Darmstadt, in 1835, Repertorium f. de Pharmacie. Bd. li. p. 369, wherein he mentions the solubility of brucia in ammonia and caustic alkalies and earths, and determines the quantity of brucia in the alkaline mother liquor from the precipitation of strychnia by acidulating and then precipitating it with corrosive sublimate.

It might be supposed that, as this solubility is considered a characteristic of igasuria solely, this alkaloid or mixture of alkaloids was identical with brucia, and that there were in fact but two alkaloids present in the plants of one family. But there is a considerble degree in this solubility; a portion of the dissolved alkaloid crystallises out, while the remainder, which however forms a crystalline salt with oxalic acid, is held indefinitely long in solution.

Strychnia itself is, to some extent, soluble in alkaline liquids. As the proper alkali for experiments and assays of this kind, I have long since used and lately recommended in a particular instance, crystallised caustic baryta, which, in my opinion, cannot be surpassed by any other substance of this class. My remarks in this connection have therefore exclusive reference to precipitation and solution by means of caustic baryta.

One hundred c. c. of a solution of baryta at 60°F. dissolve 0·036 of a gramme, or 0·55 of a grain of strychnia.

One hundred c.c of the same solution of baryta dissolve as a minimum 0·5 grammes, or nearly 8 grains of brucia.

In determining the strength of a preparation from a drug containing these alkaloids, it is only necessary to know the quantity of a reagent required for the sum of the alkaloids, to precipitate a known portion of the solution made from the preparation by baryta, and to dilute the alkaline liquor to a certain strength sufficient to hold in solution all the brucia which may be present.

A gramme of pure strychnia requires for precipitation 59·88 c. c. of 1-10th normal solution of iodide of mercury, provided the strength of the solution does not exceed $\frac{1}{2}$ of one per cent. The precipitate produced differs in its composition from that yielded by other alkaloids, inasmuch as it contains 2 eq. of mercuric iodide to one of hydriodate of the alkaloid. The quantity of 1-10th normal silver solution equivalent to 59·88 c. c. of mercury solution is 239.52 c.c.; of the 8 equivalents of iodine and chlorine contained in the 59·88 c. c. mercurial solution, 3 of iodine or $\frac{3}{8}$ are absorbed by the alkaloid, and there is consequently a deficiency of $\frac{3}{8}$ of the number of cubic-centimetres of the silver solution; i. e., to precipitate the filtrate from the mercurial precipitate of 1 gramme of strychnia, only 149·7 c. c. of silver solution are required.

A gramme of pure brucia requires 42·9 c. c. of mercurial solution, and the composition of the precipitate is analogous to that of the strychnia compound, and to that of the combinations of mercuric *chloride* with strychnia and brucia. It is also necessary that the brucia solution be dilute and contain no more than $\frac{1}{2}$ per cent. but rather less of the alkaloid. In this case there will consequently be a deficiency of 64·35 c. c. of silver.

Of the troy weight solution of iodide of mercury, containing 16 and 2-9th grains of corrosive sublimate and 60 grains of iodide of potassium in 12$\frac{1}{2}$ troy-ounces, every 10 grains correspond to 0·0334 of a grain of strychnia, and 0·0466 of a grain of crystallised brucia.

With these data the subjoined assays have been made, exhibiting the relative strength of the officinal preparations from nux vomica and ignatia seed, and the proportion of strychnia and the alkaloids soluble in water and alkalies, which I have classed as brucia.

I. *Six ounces powdered Nux Vomica exhausted by displacement with* 80 *per cent. alcohol.*

The tincture was evaporated on the water-bath with a little hydrochloric acid to the consistence of mellago. While still warm, it was mixed with 50 c. c. of cold water, and the fatty substances allowed to separate by standing; the whole was then filtered, and with the washings diluted to 100 c. c.

20 c. c. of these required for precipitation 21·5 c. c. of mercurial solution; the 100 c. c., or 6 ounces, therefore 107·5 c.c Hg.

20 c.c. were then given in a 75 c.c flask, diluted with water to 75 c.c., and then shaken with crystallized caustic baryta in excess. After filtering the alkaline solution, 40 c.c. of it was acidulated with hydrochloric acid, and then precipitated by the mercurial solution; they required 10.3 c.c., or 19·3 for the 75 c.c.—20 c.c original solution. These 75 c.c. hold in solution strychnia

equivalent to 1·63 c.c. mercurial solution, which deducted from 19·3, leaves 17.67 c.c as the equivalent of brucia, or 88·35 c.c. in the 6 ounces. The latter number deducted from the original 107·5 c.c leaves 19·15 c.c as the equivalent of strychnia.

The 6 ounces of nux vomica, exhausted by alcohol of 80 per cent., therefore contain

31·75 grains of Brucia.
4.69 " Strychnia.

II. *Six ounces of the same powdered nux vomica exhausted with boiling alcohol of* 80 *per cent., acidulated with hydrochloric acid.*

The tincture from this was treated in precisely the same manner. The fatty substance contained more fluid oil.

They were found to contain

26·7 grains of Brucia.
8·57 " Strychnia.

III. *Tincture of Nux Vomica.*

225 c.c. contain 2.93 grains of Strychnia.
19.5 " Brucia.

IV. *Extract of Nux Vomica.* 5 grammes

Contain 2·46 grains of Strychnia.
7·75 " Brucia.

V. *Extract of Nux Vomica* (Ph. Boruss.) 4·6 grammes

Contain 0·7715 grains of Strychnia.
13·1155 " Brucia.

VI. *Semen Ignatiæ.* 2 ounces displaced with alcohol (80 p. c.)

Yielded 4·93 grains of Strychnia.
9·86 " Brucia.

VII. *Semen Ignatiæ*, (the same.) Two ounces extracted with alcohol and hydrochloric acid

Yielded 4·5 grains of Strychnia.
13.73 " Brucia.

VIII. *Extract: Ignatiæ Alcohol:* 8·15 grammes

Yielded 4·93 grains of Strychnia.
8·42 " Brucia.

Proceed. Amer. Pharm· Assoc., 1863.

ON ÆSTHETICAL PHARMACY.

By Frederick Stearns.

The graduate, while versed in theoretical and practical pharmacy, as taught in the schools, is left to chance circumstances in acquiring that knowledge and those habits which a proper preliminary understanding of the commercial, ethical and æsthetical elements of education would endow him, and upon which his professional position in the community, and his pecuniary success, in no small degree depend.

Commercial education, as applied to the tyro in our trade, is a subject fit to enlarge upon by itself. Ethical education Mr. Parrish gave some valuable hints upon, in a paper some years ago presented to the Association.

Æsthetical education, a department worthy of considerable elaboration, is one upon which I propose to offer the following.

When we reflect how naturally the uninformed public judges men—business men—by external appearances, it is obvious that the cultivation of good taste, and an appreciative sense of the beautiful, should be no unimportant element in pharmaceutical education, and upon the proper exercise of which, pecuniary success, and good social position are to a certain extent the direct results.

From ignorance of æsthetics, as relating to our art, many never reach that position in the public eye which their real talents should command, and of which, perhaps, others really less worthy in every other sense may rob them.

I hold that, as a business man, the pharmaceutist is entitled to the benefits of all legitimate methods of enriching himself; that he is not altogether to be considered the self-sacrificing conservator of public health, a pattern of meek benevolence, or bound to hold his light continually under a bushel for fear of violating professional modesty; and because the quack pharmaceutist may, without much real merit or character, by shrewd business tact, and the careful consideration of the æsthetical in winning public favor, gain success, it does not follow that the really scientifically educated pharmaceutist may not cultivate those same habits of good taste, as an addition to his more solid acquirements.

Æsthetical laws apply to the ornamentation and convenient arrangement of our stores and laboratories, to the display of our wares, and, above all, to the general management of business, the careful elaboration of which tends beside to refine the man, to develop the more genial qualities of human nature, the social courtesies that help to place him among gentlemen, and to add dignity to his chosen profession.

The customer most indifferent to the skilful, scientific details of the labors of a dispenser, will notice and commend the simple elegance of a package nicely wrapped, or a bottle neatly finished, and from such the inference is apt that, where elegance is *constitutional*, and neatness *chronic*, there skill lives!

The fittings and the furniture of a dispensing pharmacy afford an opportunity to study and apply æsthetic rules, more so to my mind, than in the ornamentation of any other place of business. It is a matter of some moment how to combine usefulness and elegance in such fittings, and we find too many examples of proprietors who, actuated by the laudable desire of having their premises unique or original, violate the simplest æsthetical rules by over-doing and over-crowding, or else carry their designs into the fantastic and absurd.

The following may be an approximation to the true æsthetic idea in such matters.

In those portions of the permanent fixtures of a store comprised in shelving, cornices, drawers, counters, casing, etc., where capital is limited, employ straight lines; classical mouldings, few and simple if made in cheap woods, white only in such wood; do not strive to imitate oak, rosewood, or mahogony with paint. When greater expenditure is allowable, the same general rules carried out in real fine woods, or further yet, the working of the cornices in bold arches or curves and projections, the employment of carvings not too elaborate, panel work, brackets, etc., serve to display the liberality of a proprietor within æsthetic rule.

I should designate that style of ornamentation where gilded mouldings, and the profuse employment of embossed stucco work prevails, as the "Steamboat style," as vulgar as it is unreal. The great improvement made of late years in glass shop furniture, in quality of material, and simple beauty of form, leaves hardly more to be desired,

My idea is, a few good bottles rather than many cheap ones; nor should shelving be cumbered with glass or porcelain jars for ornament merely.

The shop label has been the subject of endless changes, until now the elegance of some of the forms is only matched by brilliancy and durability where glass and porcelain are used. At the prescription counter, a happy adaptation of means to ends should be studied, in the conveniences of it; the dispensing bottles small, in order to be in sufficient numbers; the various necessary appliances near at hand; no room lost in it or under it.

I doubt whether the usual practice of surrounding the top of the prescription counter with a close rail or case to free the operator from external observation while at work, compensates for the careless habits it may lead to, and the dirt corner it affords; better a rather high counter, marble top perfectly open, serving to display skilful and graceful manipulatory work, and clean utensils, for these are æsthetic. Arrange the position of drawers and shop bottles with reference to the principal working centre, or scale of the shop; that is, having those articles most used nearest to it, not by any arbitrary alphabetical rule, for the first aids the rapid dispatch of business, and the last is surely no stimulus to memory. Do not paper walls, for no matter how nicely done, it has a cheap look; better a pure white, even with white fixtures; it is a fine offset to dark ones.

In fresco or calcimine ornamentation use soft colors, no strong, exciting ones; by exciting ones I mean such high bright ones as will produce upon the eye of an excitable person the same effect, comparatively, that the red cloth does on the bull. Above all, do not allow your ambitious fresco artist to crowd impossible flowers or fantastic scroll work into impossible places: simple panel work in delicate tints is to be preferred.

If you cannot afford marble or tile for flooring, cover it with something, if nothing better than rugget, or oil cloth: in the latter choose the stone, or tile colors and design—not the flower patterns.

There is one class of fixtures you can hardly over-crowd a store with; that is good show casing, either flat or upright. As now made, in metallic frames and fine plate glass, they are in good taste almost everywhere. Serve to display goods to the best possible advantage; afford the means of developing the artistic gracefulness of grouping goods which may exist in assistants, and which again are economical; for I have always found that goods well displayed, in a great measure sell themselves.

Show windows, open, fine quality of glass, and always clean. Show bottles, few, but choice; colors, rare and light. Do not crowd a window with goods; rather let the front be as a show-case lid, to show a nicly arranged store within.

The foregoing, relating to permanent fixtures, are mere skeleton ideas, which can, of course, be elaborated in a variety of ways, all within æsthetical rules, and due regard to harmony of arrangement and general design.

A still richer field for the organization and operation of æsthetical rules lies in the every day labors, and in all the manipulations of the store, where everything done, or every item dispensed, is to teach by its neatness, nicety, simplicity, elegance, or beauty, a lesson to your customer in the science of the beautiful.

Æsthetical should be your choice of dispensing glass, in form, quality, and finish; of twines, of corks, of powder, or wrapping paper—these last in reference to color, cutting and shape.

Elegant in appearance should be all medicinal preparations; your syrups, tinctures, wines. etc., clear, clean and bright, and never dispensed otherwise.

The manipulatory hand work at the prescription counter should be not only well, but neatly and gracefully done. I consider the perfect mixing of a pill mass, the brightness of a solution or lotion, the evenness of consistence of an ointment, etc., etc., all so perfect as to exhibit skill and labor as bordering upon the æsthetic.

And, again, in externals: powders, equally folded in fair paper nicely cut, enveloped or boxed, a perfect fit; pills carefully finished, coated or powdered, boxed in nice shapes; the ointment jar or gallipot of a nice quality, covered, and of convenient sizes and shapes; dispensing bottles of various kinds, of better qualities and selected finish; and so with corks and seals.

These and a hundred other excellencies in dispensing, must be developed by acquired experience in æsthetic rules.

Then, again, labels. Nowhere in Pharmacy can greater good or bad taste be shown than in dispensing labels; few even of printers or engravers can make a passable one. In my own experience I have met with but one real genius who, as a "typo," understood the harmonious relations of type so as to make a really elegant label; while engravers and lithographers, who are not compelled to submit to the arbitrary forms of type in arranging the form or contents of a label, produce but little choice work.

It is almost impossible to offer suggestions as to how they should be done. Experience is the best teacher, aided by the comparison of those used by competing pharmaceutists. My idea is that in labels simplicity of form and borders, terseness of wording, truth in explaining merits or composition of material, plain directions, fine quality of paper and ink, and good press-work, should all be looked to.

The manner of holding a graduate, of handling a spatula, of rolling a pestle, of corking a bottle, of wrapping it, of tying a package, of handing it to a customer, of taking and paying change, can all be benefitted by a touch of the æsthetic.

In the introduction of specialities and their putting up, is a fruitful field of æsthetic taste. Doubtless, most of my confreres of the Association have studied and reflected upon this subject themselves, and to those only who may not have done so, and to the beginner in business life, does the subject apply.

So on, by earnestly and carefully feeling the way along, day by day, one may find continually new methods and new ways of cultivating the beautiful in the details of laboratory and shop, and in general management of business.

Detroit, Sep. 1st, 1863.

Proceed. Amer. Pharm. Assoc., 1863.

AN ALKALOID IN LYCIUM BARBARUM, L. (SOLANACEÆ).

By Drs. Husemann and W. Marmé.*

The fact that nearly every genus of the family of Solanaceæ is known to yield a peculiar alkaloid, led us to examine with this view a plant very generally cultivated for ornamental purposes, and as a shading climber, and in many instances found growing spontaneous,—*Lycium barbarum*—the matrimony vine. Prominent physiological effects have so far not been ascribed to this or other species of Lycium, and only very moderate use is made of them in medicine. The fruit and leaves of *L. Chinense*, Mill., which is closely allied to *L. barbarum*, have been employed for various affections in the form of infusion; the leaves of *L. umbrosum* are used in Columbia in rash. The young shoots of *L. Europæum* are known to exert some action on alvine and urinary discharges, while the leaves of *L. afrum* are now and then given for erysipelas and lichens. The young leaves and tops of the latter species are even eaten as a kind of salad in Spain, and the berries of *L. humile* are likewise consumed in Chili.

We have examined the leaves and stalks of *L. barbarum*, each separately. Having commenced with, and used in succession, all known methods for eliminating volatile, as well as non-volatile, vegetable bases, but without arriving at any positive result, we took up as a last resource the process introduced by Sonnenschein (*American Journ. Pharm.* vol. xxx. p. 550) for the separation of poisonous alkaloids from human remains in forensic cases, and which is founded on their precipitation by means of phosphomolybdate of soda. With the aid of this reagent we succeeded in extracting both from the leaves and stalks a solid base, possessing all essential properties of the alkaloids, and which we have named *lycina* (lycin). It differs from all known solid vegetable bases by the remarkable readiness with which it dissolves, so as to deliquesce within a few minutes when exposed to the air; this fact explains the difficulties we met with in its extraction by any other method.

The largest yield was obtained from the leaves; owing to the preponderance of the woody portion the product extracted from the stalks was much less, though the liber must be considered to

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* Translated for this Journal by Prof. Mayer, of New York.

be rich in the alkaloid. The decoctions obtained by boiling the parts properly comminuted in repeated portions of water, and which were pretty dark-colored, were precipitated by subacetate of lead. The copious lemon-colored precipitate was separated from the liquor by decantation, and the latter, after being freed from excess of lead by means of sulphuric acid and again neutralized with soda, was evaporated to one-third of its original bulk. It was then again strongly acidulated with sulphuric acid and completely precipitated by phosphomolybdate of soda. As we had to use large quantities of this reagent, we prepared it, not according to the method directed by Sonnenschein, but by simply dissolving 30 equivalents of molybdic acid in a solution of the corresponding quantity of caustic soda, adding afterwards an aqueous solution of one equivalent of phosphate of soda. The pale yellow colored, flocculent precipitate deposits very readily, and can then be washed with water acidulated with sulphuric acid without undergoing any perceptible decomposition.

The high price of molybdic acid induced us to employ in its stead the tungstate of soda now to be had in commerce at one-fifth the cost of the other, and the same object is attained in fact by employing a mixture of 30 equivalents of tungstate and one of phosphate of soda. But, taking into account that a complete precipitation by phosphotungstic acid is possible only in presence of a large excess of sulphuric acid, that the precipitate is much more difficult to wash than the phosphomolybdate of the alkaloid, and that in view of the difference in the equivalents, that in expense is after all only as 1 : 2: it is probable that the molybdic compound will be maintained in use, until tungstate of soda, as is quite likely, shall have become less expensive.

The precipitates formed by either of these reagents were, while still moist, mixed with carbonate of baryta, the pasty mass on the water bath with constant stirring reduced to dryness, and then exhausted with boiling alcohol. The alcoholic solutions on evaporation left a somewhat colored syrupy residue, without signs of crystallization, the solution of which in dilute hydrochloric acid, after filtering off some resinous matter, yielded on evaporation very fine crystals. When pressed between bibulous paper and repeatedly recrystallized from hot alcohol, these form brilliant white rhombic prisms, half an inch in length, very readily soluble in water, also in ordinary alcohol, and scarcely in ether. From their watery solution they deposit in form of fernlike aggregations, have an acid reaction and taste, and are the hydrochlorate of the new base.

On drying this salt, with a pulp of carbonate of baryta and water, over the water-bath, and then extracting with boiling alcohol, the alkaloid will be left in a perfectly pure condition on evaporating the alcoholic solution, as a white mass of radiating crystals, of a sharp but not bitter taste, at once deliquescing in the air, readily soluble in alcohol, nearly insoluble in ether, fusing and decomposing when heated in a tube, and completely destroyed at higher temperatures.

Besides the hydrochlorate we have prepared in fine crystals the double salts with the chlorides of platinum and of gold, and the likewise crystallizable and very readily soluble, in part also deliquescent salts with sulphuric, nitric, chromic, acetic and oxalic acids.

We have as yet been prevented to enter more fully into an analytical investigation of lycina and its salts, and shall be unable to do so for some time to come. For these reasons we have thought it best to communicate the above first results, the more as we are of the opinion, that the mode of extracting the alkaloid which we have delineated will lead to the discovery of other similar ones which have hitherto been overlooked on account of their solubility.—(*Annalen der Chemie u. Pharmacie*, ii. *Supplement—Band*, *S.* 383, 1863.) F. F. M.

NOTE ON ATROPIA.†

By Dr. E Pfeiffer.

While engaged in the summer of 1861, together with my teacher, Prof. Ludwig, at Jena, in going over the reactions of some alkaloids which in many forensic cases serve almost as sole indications of their presence, we noticed the peculiar pungent benzoic acid odor given off by atropia during its combustion.*

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* The same has been observed by Niemann in the combustion of the double chloride of atropia and gold. (*Dissertation über eine neue organische Base in den Coca-blættern;* Goettingen, 1860.)

† Translated for this Journal by Prof. Mayer, of New York.

Prof. Ludwig then recommended that I should distil a small quantity of the alkaloid with bichromate of potassa and sulphuric acid, in order to obtain in this manner, if possible, the volatile acid. In fact, after a little boiling, the sweetish odor often accompanying benzoic acid became perceptible, some drops of oil appeared on the surface, and on continuing the boiling, small iridescent scales and needles made their appearance in the receiving vessel, which, from their pungent odor and their shape as observed by the microscope, were easily recognised as crystals of benzoic acid.

This distillation was subsequently repeated twice with larger quantities (2 to 3 grammes) of atropia, using the proportions of 5 parts of bichromate of potassa and 15 of oil of vitriol, previously diluted with 3 times its weight of water, to every two of the alkaloid. Immediately after the boiling had commenced, there appeared in the receiver vapor of the odor of oil of bitter almonds. The first portions of the distillate gave to ether, on being shaken with it, a small quantity of a yellowish oil, which possessed this odor besides the property of becoming milky with water and yielding acicular crystals on evaporation with a drop of fuming nitric acid. When the boiling had continued for 10 minutes a considerable quantity of benzoic acid had collected on the surface of the now greenish fluid in the retort, in the form of a white froth, which was at once obtained pure by filtering and washing. Both filtrate and washings were then distilled nearly to dryness, from the distillate the benzoic acid extracted by agitation with ether, then combined with soda, and from the concentrated solution of the soda salt again separated by means of hydrochloric acid. In this manner about one-fourth of the quantity of atropia was recovered in the form of benzoic acid.

Its fusing point was exactly 248° F; the silver salt formed in acicular crystals with a mother-of-pearl lustre; both gave in ultimate analysis the numbers required for benzoic acid.

The residue from the distillation contains all the nitrogen of the atropia in form of ammonia; no other organic bases were to be found, for distillation with soda lye furnished a volatile product which, with chloride of platinum, gave pure double chloride of ammonium.

In the fall of 1862, I continued my researches at Gœttingen under the guidance of Prof. Geuther, and at his suggestion endeavored to perform the splitting of atropia by means of a concentrated solution of soda. The same alkaloid was used for these experiments, one part with 6 of caustic soda and 15 parts of water heated in a flask connected with a condenser, the far end of which was joined air-tight to a small flask, and this was again connected by means of a glass tube with another flask containing dilute hydrochloric acid.*

After boiling the alkaline mixture for about an hour, at first with occasional shaking of the flask, a period arrives when the oily drops of the alkaloid floating on the surface agglomerate and adhere to the sides of the vessel; and the vapours which before were visible in the receiver appear no longer. The operation is now interrupted, the whole of the original atropia being converted into a volatile base and an acid, the soda-salt of which latter is the pale resinous mass, which, though much denser than at first, is still floating on the surface of the excess of soda lye ; further heating would cause it to assume a brown color, while products of a secondary decomposition would likewise result.

After the mixture has become cooled, water is added with care; this dissolves the excess of caustic soda; the resinous salt remains floating on the surface of the solution, and can be washed in this manner, at least from the portion of soda adhering on the outside. The cake is then dissolved in water and treated with carbonic acid, then evaporated to dryness, on the water bath towards the last, and freed from the carbonate of soda by means of alcohol. The alcoholic solution was evaporated in a little flask, and when cold the residue again dissolved, this time in ab-

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* In a paper on "*Phosphomolybdic Acid as a test for Alkaloids*" (Proceedings Amer. Pharm. Association for 1862, p. 229–232.—Amer. Journ. Pharm., vol. xxxv. p. 63.—Chemical News) will be found an account of an experiment made for the purpose of ascertaining the presence of ammonia in Extract of Belladonna ; the latter was mixed with caustic soda lye, and at the ordinary temperature a current of hydrogen gas passed through its solution ; this gave off an alkaline vapor of an odor resembling that of conia, producing white fumes with acetic acid, and its solution in nitric acid gave a precipitate with phosphomolybdic acid. F. F. M.

solute alcohol; to this solution ether was added until precipitation was established, the cloudiness not disappearing on shaking, and the flask, well stoppered, was left to stand for 24 hours. Poured off from the remainder of the salts which had then separated, the ether-alcoholic solution left, on evaporation, a non-crystallizable, varnish-like mass, transparent but with a tinge of brownish yellow. The solution in water of this substance possesses an alkaline reaction. Though soluble in a small proportion of water, more of the latter causes a turbidity, which should be removed by filtration, and the clear filtrate then be considered a solution of the pure salt.

Hydrochloric acid separates from the watery solution the new acid, which appears at first in the form of drops of oil, but gradually solidifies and becomes crystalline; being but little soluble in cold water, the acid can be freed from chloride of sodium by means of water. On dissolving it in hot water and filtering, it left a brownish resin, difficultly soluble in water, and of an acid nature, to judge from its solubility in carbonate of soda, and its separation from this solution by other acids. This appears to be a product of the decomposition of the crystalline acid; it possesses an odor resembling mead, the same as the other previous to its purification. The latter crystallizes in brilliantly white rhombic plates similar to those of benzoic acid; its fusing point is at 208° 4 F., the point of congelation at 203° F. Its vapor has an acrid odor, similar to that of benzoic acid, but more sweetish; in the oxidation with bichromate of potassa and sulphuric acid, the pungent odor of benzoic acid was more prominent.

The crystals are free from nitrogen, and their formula, corresponding to 73·6 p. c. carbon and 6·1 p. c. hydrogen, is expressed by $C_{48}\,H_{24}\,O_{10}$. It is possible that, owing to the presence of some of the resinous acid, these numbers are somewhat too small, and that they are probably better represented by 74·1 p. c. and 6·2 p. c., which would give $C_{20}\,H_{10}\,O_4$ as the formula. In that case this acid would stand to cuminic acid in the same relation as acrylic acid to propionic. In its properties it shows in fact a certain resemblance to cuminic acid.

The volatile alkaloid which resulted from the action of soda on atropia remained on evaporating the hydrochloric liquid in the receiver, as hydrochlorate in the form of deliquescent acicular crystals, handsomely arranged in concentric groups, aborescent at the margins. This is the only product to be found, besides traces of ammonia, which appear to be accidental, and a minute quantity of some resinous matter, easily removed by solution in water and filtering. Much less in proportion of this base was obtained than of the acid. Two grammes of atropia yielded 1·65 grains of the soda salt, but only ·3 of a gramme of the hydrochlorate of the alkaloid.

From the latter the alkaloid was obtained in the free state by means of caustic soda, as an oily liquid of a faint ammoniacal and peculiarly sweet odor. The solution of the hydrochlorate mixed with chloride of platinum yielded a soft resinous compound not fitted for analysis, while chloride of gold appeared to form a double salt soluble in water. Three combustions were made with small quantities of the hydrochlorate, 0·1 gramme for each, and the resulting numbers, though they have as yet no positive claims of correctness, will serve to give an idea of the proportions in which the constituents are combined. The numbers found were 54·4 p. c. of carbon, 10 p. c. of hydrogen, 20·7 p. c. of chlorine, 10·1 p. c. of nitrogen ; the loss of 4·8 p. c. must be attributed to hygroscopic water, and consequently this base is free from oxygen. Further investigations will have to be made in order to establish its true formula.

The result of the action of soda on atropia is therefore a decomposition of the alkaloid into an acid and a base, from which follows that it will have to be ranged among the amides.—*Annalen der Chemie u. Pharm. Band* cxxviii. p. 273.—F. F. M.

ON ATROPIA.*

BY DR. K. KRAUT, OF GŒTTINGEN.

It has been known, ever since the discovery of this alkaloid, or rather even before it had been isolated, that the narcotic principle of belladonna underwent decomposition by treatment with alkalies as well as concentrated acids. Nothing very definite has ever been published in regard to these decompositions, beyond the discovery of an acid resembling benzoic in belladonna, by W. Richter,

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* Translated for this Journal by Prof. F. F. Mayer, of New York.

the remarks of the discoverers of cocaïna on its relation to atropia, and the note of Ludwig and Pfeiffer on the decomposition by means of chromic acid; all of which pointed very strongly to the probability of one of the products of the decomposition belonging to the group of aromatic compounds.

The experiments which I now communicate are not yet concluded, but are given in their present shape, since I have ascertained that the same subject was under examination by others.

When atropia, in a sealed tube with a hot saturated solution of baryta in water, is kept in the water-bath for two or three hours, a clear colorless solution is formed, which, when afterwards diluted with water and submitted to distillation, yields but traces of a volatile base, and from the residue carbonic acid precipitates carbonate of baryta free from organic matter. The filtrate from this precipitate, which is neutral and contains slight traces of baryta, on evaporation leaves a colorless amorphous varnish in which, after standing for some weeks over oil of vitriol, there appear a few stellate crystals, less soluble in water than the remainder, and containing all the baryta still present. The soluble part of the extract, forming the principle portion, is an uncrystallizable salt formed by the splitting of atropia after receiving two equivalents of water. Dissolved in water it is at once rendered milky on the addition of hydrochloric acid; after a few seconds acicular crystals of an acid are deposited while a base remains in solution combined with hydrochloric acid.

To obtain the acid the mixture is filtered, and the filtrate repeatedly shaken with ether, which dissolves the acid. I shall name it *atropic acid*, and the base *tropia*. The reaction by which they form is represented by the following formula:

$$\underset{\text{Atropia.}}{(C_{34}\,N\,H_{23}\,O_6)}+2\,HO=\underset{\text{Atropic acid.}}{C_{18}\,H_8\,O_4}+\underset{\text{Tropia.}}{C_{16}\,H_{17}\,NO_4}$$

The crystals obtained from a solution in alcohol are oblique prismatic plates; formed from watery solutions they are acicular and possess the odor of benzoic acid, and melt and form an oil at 222° F. The saturated solution in hot water congeals to a crystalline mass on cooling. The acid contains 72·97 per cent. C and 5·41 per cent. H, therefore its formula is $C_{18}\,H_8\,O_4$, and it is isomeric with cinnamic acid. The lime-salt, which is readily obtained in fine crystals, appears to be $C_{18}\ H_7\ Ca\ O_4+3\ Aq$.

Tropia. I have as yet been unable to prepare this alkaloid in a perfectly pure form. On evaporating the original solution of its hydrochlorate, the salt crystallizes out in needles, which are again readily dissolved by water. Oxide of silver added to the solution renders it strongly alkaline, though no silver remains in solution. On evaporating the filtrate a crystalline residue is left behind, which appears to have absorbed carbonic acid from the air, and to have been also otherwise changed; at least the platinum-salt could not again be obtained from it.

From the solution of the hydrochlorate of tropia chloride of platinum precipitates this double-salt in fine orange-colored crystals, which give a yellowish red powder. Its composition is $C_{16}\ NH_{17}\ O_4,\ HCl,\ PtCl_2$. With chloride of gold there is likewise obtained a double salt in well-developed crystals. The alkaloid appears to undergo some decomposition when kept heated at 356—380° F. with baryta water for 17 hours, still the decomposition is not complete, nor is its product volatile. But by continued boiling of the aqueous solution of the alkaloid small portions of it are volatilized; for this reason the distillate obtained from tropia with baryta water possesses a slightly alkaline reaction, and in the residue are found traces of atropiate of baryta.

Atropiate of tropia is uncrystallizable, at ordinary temperature of a viscid consistency, and fuses readily with heat. A solution containing 2¼ per cent. produced no enlargment of the pupil. Its composition is represented by $C_{16}\ NH_{17}\ O_4,\ C_{18}\ H_8\ O_4 + 3\ Aq$. Two equivalents of the water only are driven off at 184° F.

Atropia is decomposed likewise by hydrochloric acid. Heated with fuming acid for four hours in the water-bath, the solution still retained some atropia, but after continuing the action for two hours more at 221° F. it yielded, with chloride of platinum, crystals resembling those of the tropia-salt. Here there was likewise formed an acid which had separated in the form of oily globules; these, however, I have as yet been unable to identify with atropic acid.

In connection with the above I have instituted a series of experiments for the purpose of investigating the action of *caustic baryta* in the presence of water on such substances as are not affected by it at 212° F., but which, on being heated with other caustic alkalies, yield various products of decomposition. Preliminary experiments have shown me that *glycina* begins to be decomposed when kept at a temperature of 311° F. with concentrated baryta-water for 22 hours, methylamina being one of the products; *nicotina* at 338° F. yields a base, the platinum-salt of which differs from the double chloride of nicotina and platinum; *morphia* and *cinchonia*, at 480°—505° F., form small quantities of volatile bases. One of the secondary products of the reduction of nitrobenzole by Béchamp's method, is at 374° F., split entirely into a volatile base and an acid, of which latter I have now the baryta-salt under examination.—*Annalen der Chemie u. Pharm.*, cxxviii, p. 280—285.

NOTE.—Richter describes as *atropic acid* a substance closely resembling benzoic acid, but yielding no precipitate with ferric salts. In his method for preparing atropia, by setting the watery infusion of the root to ferment with yeast, and treating the clarified extract with ammonia and ether, this acid remains in combination with the ammonia, is afterwards combined with potassa, and then separated by means of sulphuric acid. It is more than probable that the acids obtained by Richter and Pfeiffer, as well as by Kraut, are identical.

The proneness of atropia to undergo a change or decomposition when exposed to moisture or at a higher temperature, or in contact with alkalies, has been noticed by Geiger and by Berzelius, and the experiments detailed on pp. 26—28 of Vol. xxxv. of this Journal may serve as illustrations of the decomposition which the alkaloid undergoes under such circumstances while still in its natural combination. Berzelius gave the name *tropia* (tropin) to the amorphous substance which results when atropia is left for some time in its mother-liquor. This varnish-like matter, a portion of which only forms into crystals after standing for some time, retains the properties of an alkaloid only in part, and requires much less than the calculated quantity of iodohydrargyrate for precipitation. It possesses a peculiar narcotic odor, and its diluted solution deposits a reddish-brown, humus-like substance, devoid of narcotic properties.

Besides atropia, there is present in belladonna a volatile base, which has been mentioned by Brandes, and has been separated by Luebekind as a crystalline sublimate on distilling the leaves with caustic potassa. The extract of belladonna likewise yields a volatile base at ordinary temperatures in contact with caustic alkaloids. It remains then to be seen in what relation these four alkaloids stand to each other and to atropia. F. F. M.

ON THE CONTAMINATION OF AMERICAN SULPHURIC ACID WITH ARSENIC.

By John M. Maisch.

The query allotted to me for investigation, is: "Do any of the best samples of sulphuric and other mineral acids of American origin, contain appreciable amounts of arsenic?"

The mode of investigating the subject was as follows:

The sulphuric acid was treated directly in Marsh's apparatus, with pure zinc, and the hydrogen evolved treated in the well known manner. The nitric acid was partly saturated with pure carbonate of soda, evaporated to dryness, the residue treated with an excess of pure sulphuric acid, heated to drive off the nitric acid, re-dissolved in water, and now examined in Marsh's apparatus. The muriatic acid was diluted with water, sulphuretted hydrogen was passed through it, and the dried precipitate, after being mixed with dry carbonate of soda and cyanide of potassium, was heated in a current of dry carbonic acid gas, according to the method of Fresenius and Baba.

I have examined the three mineral acids named, manufactured by Kalbfleisch, of New York, Powers & Weightman, Rosengarten & Sons and Charles Lennig, of Philadelphia, and have in no case met with *any* trace of arsenic.

This result appears to speak well for American acids. But it must be remembered that the query is therewith not fully answered. The origin of arsenic in the mineral acids is to be looked for in the sulphur, which frequently contains traces or larger proportions of arsenic in the form of sulphides. The arsenic is volatilized when the sulphur is burned in the manufacture of sulphuric acid, and if this acid is contaminated with this poisonous metal, the nitric acid *may*, and the muriatic acid *must*, contain the same. But its absence in two or three samples does not prove yet that it may not be found in the fourth one. The only way to get at positive results is, to subject every sample to a rigid examination, which is at once a very interesting and a very easy process of manipulation.

The decision, however, at which we arrive from these experiments is, that acids of American manufacture are of the same purity, as far as arsenic is concerned, as those of foreign origin. While I have, on former occasions, occasionally met with arsenic in American oil of vitriol, yet this metal does not constitute one of the impurities of every sample, and the acids produced by the same manufacturer are likely to vary considerably in this respect.—*Proceed. Amer. Pharm. Assoc.*, 1863.

ON THE EXTRACTION OF POTASSA FROM MARL.

By George J. Scattergood.

The green sand or marl of New Jersey, according to analysis, contains, among other constituents, from 10 to 12 per cent. of potassa. Query. "Can this potassa be economically extracted sufficiently pure for pharmaceutical and commercial use, so as to compete in price with that derived from wood ashes?"

The experiments which have been performed in reference to this question require that it should be answered decidedly in the negative. The small proportion of potassa, and the very insoluble form in which it exists in the green sand, are insuperable obstacles to the latter ever becoming a cheap source of commercial potash. The results, however, which have been obtained are not entirely devoid of interest, since they show the effects of certain agents upon a substance whose chemical nature is as yet but little known.

The earlier analyses of green sand have shown, as above stated, the large amount of 10 or 12 per cent. of potassa. But later investigations, performed by improved methods, have not confirmed their accuracy; but, on the contrary, have pointed to the fact, that the alkali, previously estimated as potassa only, is in part soda, and that the average amount of the former throughout the green sand formation in New Jersey does not probably average more than 5 per cent.; and from but few specimens can as much as 7 per cent. be obtained. (Report N. J. State Geological Survey, 1854.)

The green sand with which the following experiments were tried contained about 6 per cent. of potassa. It is from the second or middle of the three beds into which this deposit in New Jersey has been divided, and was dug on the land of David Marshall, near Blackwoodtown, Camden County. An analysis, performed by the general process for the analysis of soils, has given the following results, viz.:

	(1)	(2)
Insoluble Silica, . .	.5	48.
Soluble Silica, . .	48.	
Protoxide Iron, . .	22.74	
Alumina, . . .	6.61	
Potassa, . . .	5.01	6.84
Soda, ...	1.08	1.47
Lime, ...	1.975	
Magnesia, . . .	1.375	1.
Phosphoric Acid, . .	4.821	
Water, . . .	7.50	
	99.611	

The phosphoric acid was estimated as the biphosphate of magnesia. This specimen is in the usual form of small, distinct, green grains, soft enough when freshly dug to be readily crushed by the nail, but becoming harder on exposure to the air; and exhibiting under the microscope, when washed from adhering clay, a general resemblance in shape to the "casts" of the Rhizopods, and other minute marine animals. In order to separate the potassa from the green sand, I have tried several of the cheap and powerful chemical agents,—carbonic, hydrochloric and sulphuric acids, quicklime and sulphate of lime.

Carbonic acid, though a weak acid, has been stated to be one of the readiest agents in decomposing green sand. But I have not been able to obtain by it any appreciable amount of potassa, and only a trace of iron and lime. The quantities used were 100 grains of green sand, and 12 oz. of water charged with carbonic acid.

Hydrochloric acid decomposes green sand, only after being boiled with it for several hours, or after contact with it for several days in the cold. The potassa is thus obtained as a chloride—an undesirable form—and in mixture with other chlorides, the separation from which is attended with considerable expense.

When green sand is treated with sulphuric acid, the alumina as well as the potassa is dissolved, resulting in the formation of alum. As the quantity thus obtained is considerable, and as this substance has several times already been suggested as a commercial source of alum, I have tried a number of experiments to ascertain the comparative yield. 3500 grains of green sand were treated with 1750 gr. sulphuric acid (62 per cent.) diluted with water. The first crop of crystals weighed 630 gr.; the second 200 gr.; in all 830. The mother liquors, still being quite acid, were mixed with 1750 grains more of green sand, and yielded at a third crop 306 gr. of alum. Again, adding a fresh portion of green sand (1750 gr.) 100 grains more were obtained, making in all 1236 gr. of alum from 1750 gr. sulphuric acid, and 7000 gr. green sand employed. A large quantity of the soft sulphate of the sesquioxide of iron was also obtained, capable of yielding a considerable amount of copperas on being reduced with metallic iron.

When the green sand had been previously roasted, the yield of alum was still greater. The protoxide of iron in the green sand being thus converted into the more insoluble sesquioxide, and thus rendered less capable of combining with the sulphuric acid. 1750 gr. sulphuric acid (62 per cent.) treated with successive portions of roasted marl, yielded 1686 gr. alum, and an amount of the sulphate of the sesquioxide of iron sufficient to produce 693 grains copperas.

When the green sand was washed from the adhering clay, which in this case constituted about 9 per cent. of it, the yield of alum was not so great. A greenish crystallo-granular mass, apparently the bihydrated sulphate of the protoxide of iron, not observed in the preceding cases, was also obtained. 1750 gr. sulphuric acid (62 per cent.) treated with successive portions of washed green sand, produced 785 gr. alum and 626 gr. copperas.

It thus appears that, with a cheap source of sulphuric acid, the manufacture of alum from the green sand of New Jersey might, perhaps, be profitably carried on. And it may possibly hereafter be found that, within the limits of this formation itself in New Jersey, the material for furnishing a cheap supply of the acid exists; in the sulphuret of iron, which is widely disseminated throughout certain sections of it, or in those compounds of iron or of alumina and iron with sulphuric acid, which give those properties so injurious to vegetation to the so-called "poison," or "burning marls."

The state of combination in which the ingredients of green sand exist in it, has been considered to be that of silicates. Pelouze has called attention to the power which sulphates of lime has in decomposing glass, a mixture of various silicates. With a view to ascertain whether sulphate of lime would have any effect in removing potassa from the green sand, 50 grains of it, 100 of green sand, and 4 oz. water were mixed together, and allowed to remain in contact two or three days. Upon evaporating the liquid to dryness, 6.31 grains of solid matter were obtained, which contained only .06 gr. of potassa, about $\frac{1}{100}$ th of the amount existing in the quantity used, the remainder being principally sulphate of lime.

When green sand is treated with quicklime and water, a very small amount of potassa is obtained. 100 grains quicklime, 100 grains green sand, and 4 oz. water were mixed together, and after standing in contact for seventy-two hours, the liquid was evaporated to dryness. The solid matter obtained weighing $5\frac{3}{4}$ grains contained but .04 gr. of potassa; alumina, protoxide of iron, and carbonate of lime constituting the remainder.

The form of combination in which the silica, the iron, and the other ingredients exist in the green sand has not been fully determined. This substance has been regarded as essentially a protosilicate of iron. But I have noticed that, upon treating the grains with acid, without powdering them, after the green portion of them is entirely dissolved, the silica is left behind in the form of small, white grains, of the same shape as the original grains, and not in that state of fine division in which it would be if it had just been liberated from a state of combination. These grains of silica, after ignition, are readily soluble in a cold solution of potassa, from which facts it is inferred that the silica has not been combined with iron, &c., as a silicate; and that the green sand should not be considered as a mixture of various silicates. Whether these ingredients are in a state of combination at all, or merely in intimate mixture, remains unascertained.

It would appear that during that remarkable change which has resulted in the formation of these "casts" of minute marine animals, which the researches of Ehrenberg and the late Prof. Bailey have shown these green grains to be, the silica has been deposited in the cavity of the shell upon or during the decay of the animal; while the green colored matter, consisting of iron, alumina, potassa, &c., has been gradually deposited in the shell around it by a kind of petrifactive process during the removal of its carbonate of lime.—*Proceed. Amer. Pharm. Assoc.*, 1863.

ON THE PREPARATION OF IODIDE OF AMMONIUM.*

By Dr. Jacobsen.

The author dissolves equivalent weights of pure iodide of potassium and pure sulphate of ammonia in the smallest possible quantity of boiling distilled water. One part of sulphate of ammonia will require about one and one-third of its weight, and iodide of potassium about half its weight of boiling water for solution. The two solutions are then mixed and well stirred. After the mixture has cooled, water containing 15 per cent. of alcohol is added, and the whole is allowed to stand twelve hours. In very cold weather less alcohol will suffice to separate the sulphate of potash formed. According to Schiff,† 100 parts of water and 10 parts of alcohol at 15° C. only dissolve 3·9 parts of sulphate of potash.

The iodide of ammonium, in consequence of its greater solubility, remains in the solution, which is now drained from the precipitated sulphate of potash, filtered, and evaporated until a pellicle forms. As the solution is very concentrated, the evaporation is quickly effected.

After the crystals of iodide of ammonium are formed, they are drained from the mother liquor, which, together with the residue of sulphate of potash, is again treated with dilute alcohol, and the liquor evaporated for a further yield of sufficiently pure iodide. Care must be taken to exclude all acid vapors from the chamber in which the evaporation is carried on; and it is well to add to the solution, from time to time, a few drops of ammoniated alcohol.—*Lond. Chem. News, April* 9, 1864.

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* News Jahrbuch. für Pharmacie, bd. cxx. vii., s. 256.

† Ann. der Chem. und Pharm., bd. cxviii., s. 365.

OXYGENNESIS, FOR THE INSTANTANEOUS PRODUCTION OF PURE OXYGEN WITHOUT HEAT.

By Mr. J. Robbins.

From the time of the discovery of oxygen to the present, perhaps no subject has so much engaged the attention of chemists as the production of it at a cost sufficiently low to be employed in the arts, for the reduction of metals and other operations requiring a high temperature, and also for the purposes of illumination, the light obtained by it vieing in splendor with with the sun's rays. This desirable object has yet to be accomplished, and may be regarded as a prize to be won by some future happy discoverer. It seems surprising, since Nature has provided us so bountifully with this substance, and presented it in such a variety of combinations, that, up to the present time, there should be no known method of separating, except at such a cost which excludes it for the purposes just enumerated.

In Gmelin's "Chemistry" six processes are given for the production of oxygen :—

1st. By heating chlorate of potash to low redness. As this process is slow and tedious, a small quantity of oxide manganese is usually mixed with the salt, which greatly facilitates the decomposition, and the evolution of gas is both rapid and abundant. According to the authority just named, manganese is often mixed with carbonaceous matter, which passes over as carbonic acid, but another impurity I may mention is the presence of chlorine, which, I believe, may always be detected when oxygen is obtained by this method.

2d. By ignition of red oxide of mercury. The presence of hyponitric acid may be feared in oxygen so obtained.

3d. By strong ignition of oxide of manganese.

4th. By heating manganese with an equal weight of oil of vitriol.

5th By ignition of nitrate of potash. This salt, when heated above its melting point, is converted by the loss of two equivalents of oxygen into nitrite of potash ; on a further increase of temperature both nitrogen and oxygen pass off, consequently the product is always contaminated with nitrogen, which increases as the action proceeds.

6th. By the action of sulphuric acid on bichromate of potash. Three parts bichromate potash and four parts sulphuric acid are heated together in a capacious retort. An evolution of oxygen gas easy to regulate is the result. In this experiment we might congratulate ourselves if the process is conducted to the end without a fracture of the retort.

Of the six processes just described, two only are now used—viz., chlorate of potash with or without manganese, and manganese alone. More recently other processes have been recommended, one of which, by heating together nitrate of soda and oxide of zinc, has been patented. From this mixture oxygen is said to be produced at a cheaper rate than by any other method at present known. Unfortunately for the value of this discovery the product is contaminated with a considerable per-centage of nitrogen. M. Kuhlman, of Lille, discovered and published an ingenious and beautiful process for the production of oxygen by means of baryta. He found that by passing a current of common air through caustic baryta heated to dull redness, peroxide of barium was formed, which, on an increase of temperature, is resolved into oxygen gas and caustic baryta; the latter ready again to perform its part in a similar operation. The idea naturally suggested itself that the means were now at hand for getting oxygen from the atmosphere in any quantity at a small cost. This method, although so promising, has been for the present abandoned; it was found that after a few operations, either from a molecular change, or from the silica or other impurities, a sort of glass or fusion resulted on the surface, the baryta then refusing to act again.

We now come to the consideration of the new method for the generation of oxygen recently introduced by myself. The process or the compound employed in it has been named *oxygennesis.* It will have doubtless been observed by you that in all the processes hitherto known, a high temperature is necessary, and until that point is reached, no product whatever is obtained; this fact we may consider as the chief difficulty experienced in the preparation of oxygen, and more especially so when sulphuric acid is used. If, for example, by the mere addition of sulphuric acid to bichromate of potash in the cold, we could get the same results which are obtained by the application of heat, this process, instead of being thrust in the rear, would have taken front rank.

Oxygennesis, therefore, stands alone as a novel and the only mode we possess for producing oxygen without the application of heat. The mode of using this compound is extremely simple. We have only to take some of this powder, place it in a glass flask or bottle provided with an exit tube, pour on any of the dilute mineral acids, and we have immediately oxygen evolved in a similar way, and with as much facility, as hydrogen is obtained from zinc or carbonic acid from a carbonate.

The composition of this compound is extremely simple, merely peroxide of barium, and bichromate potash. Not so the chemical changes resulting from an addition of an acid. Peroxide of barium, on addition of sulphuric acid, is resolved into sulphate of baryta and peroxide of hydrogen, and it is from this sometimes so-called oxygenated water we get this curious and interesting chemical reaction. Whenever peroxide of hydrogen and chromic acid are brought into contact with each other, instantaneous decomposition is the result, the chromic acid is reduced to sequioxide of chromium, and the peroxide of hydrogen to water; at the same time pure oxygen derived from both those substances is disengaged. The theory of this very interesting reaction is not, I believe, well understood, and I know only one way of explaining it, that is, on the ozone and antozone theory of Brodie. According to that theory, oxygen exists in three different states or conditions, viz., ozone, antozone, and ordinary oxygen, and whenever ozone and antozone (which may both be considered more or less active) are brought together, they unite and neutralize each other, as it were forming passive or common oxygen.

To return to the composition of the powder, we are not compelled to use precisely those ingredients mentioned, but may substitute analogous compounds. Peroxide of barium might be replaced by any other peroxide capable of forming binoxide of hydrogen, of which there are several—peroxides potassium, sodium, strontium, and calcium—but all these at the present time are practically useless, peroxide of barium being the only one that can be easily and cheaply prepared. Bichromate of potash may be substituted by manganate or permanganate of potash, binoxide of manganese or binoxide of lead; the cost of the two first-mentioned forbids their present use, and the one selected is by far preferable to the others. With regard to the acids, either of the mineral class will do, but I prefer a mixture of dilute sulphuric and hydrochloric acids.

The next question demanding our notice is, in a commercial point of view, a most important one; however much this method may be admired for its simplicity, and the ease with which the operation may be conducted, its ultimate success or failure must depend on its cost. Can the oxygennesis, therefore, be manufactured and sold at a price sufficiently low to make it an article of commerce? I believe it can be, and be made available for all purposes wherever oxygen is required to the extent of some gallons. One of the ingredients of this compound, peroxide of barium, has never yet been produced and sold as a commercial article, and from the trouble of making a small quantity, but few even practical chemists care to prepare it for themselves. It can hardly, therefore, be expected that a compound of this nature can at once be manufactured and sold at a price it must ultimately be reduced to, if extensively used and produced in quantity. 5s. per pound, the price hitherto charged, would, I admit, be a barrier to its general adoption; but I am happy to say we have now made the necessary arrangements to lessen the cost of production, and have at the same time reduced the price.

Some of the baryta compounds are found abundantly in nature, and are of but small value in the market, but up to the present time but few uses have been made of them; they now promise a much more extensive application. Mr. Kuhlman has, perhaps, done more than any one else to develop their uses and value in the arts, and in the *Chemical News*, November 28, 1863, will be found some interesting extracts relating to them from Dr. Hofmann's report on chemical products and processes of the International Exhibition.

I shall trespass a little further on your time to make a few remarks on one of the various applications of oxygen, which may be of some interest to the medical profession and to pharmaceutical chemists. I mean the employment of that body as a therapeutic agent by inhalation. For that purpose this ready method for producing the gas promises to be of great value. Towards the end of the last and the beginning of the present century, vital air, as oxygen was often and not inappropriately called, was used largely in this country and on the Continent. In this country we find the names of Drs. Beddoes, Hill, Thornton, and other physicians. Dr. Hill used it for more than twenty-five years, and Dr. Thornton was quite eminent for his successful application of it. At the present time the desire by medical men for the administration of oxygen has revived both here and abroad. Two papers have recently been read, to be followed by others on the same subject, before the Academy of Sciences at Paris, by Messrs. Demarquay and Leconte. The experiments and observations of those gentlemen appear to have been very numerous and carefully made both on animals and on man, in disease and in health, and the conclusion they arrive at is, that oxygen is a valuable curative agent. If so good, then, as a remedy when its value was once known, what caused it to become and continue so long neglected? The explanation is, I think, not difficult. In the first place, when this body was discovered, too much was expected from it. The first *furore* for its employment arose from the simple experiment which showed its power of rekindling an expiring match, and as oxygen is the essential element of our existence, it was supposed it might, in a similar way, rekindle the expiring vital spark. The more imaginative were elated at what they considered a discovery, so long dreamt of and so earnestly sought after by the alchemist. But oxygen is not the elixir vitæ. It will not restore grey hair to its original color, nor make an old man young. The difficulties and expense attending its administration may also be considered other reasons for its non-employment. Of what use was it for a medical man to order that which the patient could not get supplied? A physician, therefore, having faith in the remedy, was compelled to lay himself out especially for it, become an oxygen doctor, and prepare and administer the remedy himself. These difficulties now no longer exist.

We have on the table an oxygen inhaler and generator, made according to the suggestions of Dr. Richardson. The generation of the gas is by this method so easy and and so simple that patients can prepare their own dose, or, if need be, the nurse after one lesson can as well undertake the operation as any other duty she may be required to perform.

Physicians who may wish to employ this remedy may now prescribe it with no more hesitation than they would prescribe a black draught or a calomel pill.

Dr. Squire wished to inquire whether Mr. Robbins' invention had not been patented; if so, he doubted the value of the patent, for Professor Brodie had pointed out in 1851, that when peroxide of barium was treated with an acid solution of bichromate of potash oxygen was evolved with great regularity. Faraday had mentioned the same thing in one of his lectures on ozone at at the Royal Institution. Dr. Squire also objected to the name oxgennesis, and thought it ought rather to be called oxyexodus, as the oxygen was eliminated, not created.

Mr. C. H. Wood said that the reactions of peroxide of barium, and bichromate or permanganate of potash were well known as scientific facts, but did not consider that that affected the value of Mr. Robbins' patent. The great objection to Mr. Robbins' process was the cost of the oxygen, and he was glad to hear that this was likely to be reduced. He did not consider that the process was easier than that for obtaining oxygen from chlorate of potash and manganese; indeed, he thought the latter the easier operation. He wished to know how Mr. Robbins decided that oxygen from chlorate of potash and manganese was contaminated with chlorine, and not by ozone. The late Mr. Witt had shown that oxygen obtained in this way always contained a variable proportion of ozone. He (Mr. Wood) did not consider ozone objectionable for inhalation, for he thought that whatever good was effected by oxygen when inhaled, must be due to the ozone which gave active properties to oxygen.

Professor Redwood said that Mr. Crace Calvert had pointed out that oxygen from chlorate of potash and peroxide of manganese always contained chlorine or an oxide of it, and he did not think that the gas from this source was fit to administer. He freely gave his testimony to the value of the process Mr. Robbins had introduced. The process was certainly easy, though it was not calculated for chemists, but would answer well when oxygen was wanted for medical purposes.

Mr. Robbins, in reply, said that he was not aware of Mr.

Brodie's experiments, and had not heard of them, although he had spoken to many chemists on the subject. He considered it a great boon to be able to get oxygen by a cold process, and, at all events, still considered the application new. Authorities differed as to the value of oxygen as a curative agent, but the most recent experiments of Demarquay and Leconte seemed to prove that it possessed great remedial power. Under these circumstances it was well to have a means of procuring oxygen as easily as making a cup of tea. With regard to Mr. Wood's doubt about the presence of ozone instead of chlorine, he might say that, in conjunction with Mr. Brown, now of the War Department, he had examined many specimens of oxygen obtained from the chlorate and manganese for ozone, but in all cases found chlorine instead. In his (Mr. Robbins') process the oxygen was well washed.

Mr. Wood said that washing would not remove ozone.

Mr. Robbins replied that Faraday had showed that ozone could be removed by washing, and he himself had found ozone made by means of phosphorus in the ordinary way disappear after shaking with water well for an hour.

The Chairman said he considered Mr. Robbins' an elegant way of procuring oxygen for medical purposes, which had the recommendation of cheapness when the oxygen was considered as medicine.—*Chem. News, London, March* 12, 1864, from *Trans. Lond. Pharm. Society.*

NOTE ON THE RECOVERY OF ESSENTIAL OILS FROM THEIR WATERY SOLUTION.

By Mr. T. B. Groves.

I had occasion a short time since to attempt the concentration of an aromatic water into a spirituous essence. It occurred to me to try the process stated in the "Reports of the Juries, 1851, article 'Soaps and Perfumery,'" to be practised by M. Piver. Accordingly I agitated the water in successive portions, with about one-eighth its volume of olive oil. This process, although laboriously followed, with proper care taken in recovering the oil after each shaking, failed to transfer any large proportion of the aromatic oil from watery to oily solution.

A slight modification of the process which it is the object of this note to point out, made it succeed admirably, and at the same time saved the whole of the manual labor.

The olive oil added was *emulsed* in the aromatic water by solution of potash: after standing for some time, the emulsion was destroyed by the addition of an acid, when the olive oil immediately rose to the surface, dragging with it almost the whole of the aroma. From the fatty oil the aromatic oil was easily separated, by agitation with rectified spirit.

I have not ascertained by experiment either the best fatty body to use in this process, or the best mode of effecting or destroying the emulsion; I leave these points open for those who use the method practically; but it appearing to me to be capable of being put to some use, at least in scientific inquiry, I have ventured on the above short recital of the facts.—*Pharm. Jour., Lond.,* Feb., 1864.

ON THE VERIFICATION OF CASTOR OIL AND BALSAM OF COPAIBA BY MEANS OF THEIR COHESION FIGURES.

By Charles Tomlinson.

Lecturer on Physical Science, King's College School, London.

Every one in this place must be aware of the mode of preparation, and the properties of castor oil. The seeds of *Ricinus communis* are boiled and pressed, or simply pressed without boiling, forming, in the latter case, what is called *cold-drawn* castor oil. During many years the supply of the oil to this country was almost entirely from the East Indies* (from Bombay and Calcutta). The price was low and the oil good, both as to color and taste. I have on the table a very fine specimen from the India Museum, furnished to me through the kindness of Dr. Forbes Watson. Small quantities of castor oil have been sent to this country from New York, the West Indies, and Australia, and some houses in this country have imported the seeds from the East Indies, and have drawn their own oil by pressure.

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* The castor-oil plant is cultivated all over India for domestic use, chiefly for burning. The oil is extracted by bruising the seed, boiling in water, and skimming.

We still procure large quantities of the oil from the East Indies, but that country has now a rival, threatening to become formidable, much nearer home. In the International Exhibition Italy had a great show of castor oils. One firm at Legano is said to produce 45 tons of oil every year, the produce of about 120 tons of seed. At this establishment, presided over by M. Valeri, the machinery for cleaning and sorting the seeds, the hydraulic presses, and the filtering apparatus, are said to be well arranged. The oil cake is in great demand as a manure for hemp. The oil is also used for burning, and in some places for making soap, this oil saponifying more easily than olive oil.

The cultivation of castor oil is said to be increasing in France; the yield is very great, a single plant from one seed producing upwards of 800 or 900 seeds. The seeds sometimes yield more than half their weight of oil. The French and Italian oils are weaker than those from the tropics. Italian oil, prepared in Italy, of which there are some samples on the table, is a good bland oil. There are also other specimens, prepared in this country from decorticated Italian seeds.

The oil, as you know, is very viscid, the color is yellowish, the taste, or rather *after-taste*, somewhat acrid, varying however with the freshness of the oil, and the mode of preparation. It retains its fluid, viscid character probably as low as 0°F. It differs from other fixed oils in being soluble in alcohol, a property which was long regarded as a test, until Pereira pointed out the fact that castor oil enables other fixed oils to dissolve in alcohol to the extent of 30 per cent. and upwards, so that a specimen may be mixed with olive, lard, nut, and other oils, and yet be soluble in alcohol. For example, *one* volume of olive oil, *two* volumes of castor oil, and *two* of rectified spirit, shaken together and gently heated, will form a transparent homogeneous solution. Benzoic acid and camphor also increase the solubility of castor oil in spirits containing 75 per cent. of alcohol (sp. gr. 0·860). What is called *concentrated castor oil* is common castor oil mixed with a small proportion of croton oil, which also enables other fixed oils to dissolve in alcohol to the extent of from 30 to 50 per cent.

It is superfluous to remark in this place that the distinction between chemistry and physics is not recognized by nature.

Hence a lecturer on physics may address chemists without being accused of temerity, and there are numerous precedents for substituting a physical test for a chemical one, where the latter is defective, or not sufficiently expeditious for ordinary purposes. Such is the test that I venture to propose to-night, and I apply it to castor oil and balsam of copaiba, not because it is peculiarly adapted to those substances, but because they are so well known and so largely used in medical practice. My test is of a far more general kind. It is applicable to every independent liquid, by which I mean, not a solution, although it is possible that hereafter solutions may be examined by its means. The test, as I now submit it to your critical judgment, depends on the forces of cohesion, adhesion, and diffusion. For example, if I gently deposit a drop of an oil hanging from the end of a glass rod, upon the surface of chemically clean water, contained in a chemically clean glass, a contest takes place between the forces in question the moment the drop flattens down by its gravity upon the surface of the water. The adhesion of the liquid surface tends to spread out the drop into a film, the cohesive force of the particles of the drop strives to prevent that extension, and the resultant of these two forces is a figure which I believe to be definite for every independent liquid.* The figure thus produced I name the *cohesion figure* of the liquid in question. Doubtless if there be two or more liquids in nature of different chemical composition, but precisely alike in their physical characters, such as their density and molecular attraction, and relations to heat, whereby at a given temperature they are equally fluid, or limpid, or viscid, then doubtless the cohesion figures of those two liquids would be identical. I have succeeded in converting the cohesion figure of one

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* Strictly, the figure is a function of adhesion, and diffusion: or—

$$F = f(CA\delta)$$

in which F is the figure, C the cohesive, A the adhesive, and δ the diffusive forces. The formula may also be represented in other ways. For if S be the solubility, d the density, and a the molecular attraction, then—

$$F = f(S\delta)$$
$$\text{or } F = f(Sda)$$
$$\text{or } F = f(CAda)$$

all these being identical.

essential oil into that of another by dissolving camphor in one of them, but in such case other characters were introduced which disturbed the comparison.

As the cohesion figure of a liquid depends so much on the adhesion of the surface, it is quite necessary that that surface be chemically clean. The water need not be distilled. I have found the New River Company's water well adapted to the purpose, but the vessel must be specially prepared. All vessels exposed to the air contract an organic film from their condensing on their surfaces the breath of animals, etc., and also other impurities from the products of combustion, dust, etc. If we attempt to clean the glass with a duster, however well we may satisfy the eye, we do not remove this organic film, or if we remove one, we substitute another from the cloth held in the hands ; so that when the glass is filled with water, the film in question is detached, and spread over the liquid surface, effectually preventing adhesion. The plan I recommend is to appropriate certain glasses, about four inches in diameter at the mouth, to the purpose ; to wash them out occasionally with commercial sulphuric acid, to rinse with water, and after every experiment to wash out the glass with a solution of caustic potash, and to rinse with water before filling up again. The water used for the experiment must be allowed to come to rest before the drop is deposited. The glass rods kept for the purpose should be of the same size, and these may for convenience be kept in the caustic potash vessel. When one is taken out, it should be shaken in water and wiped dry on a clean cloth. On dipping it into the oil, etc., it may be stirred round to mix the layers, if any, and then allowed to drain until the drops fall slowly; and the eye must determine when the rod is to be carried over the water, so as to deposit one, and only one drop, neatly and gently without any disturbance. In this, as in all other matters, doubtless each operator will have his personal equation, so that one man's result may not be precisely the same as that of another ; but if the foregoing directions be attended to, sufficiently good cohesion-figures will be produced. Gentlemen have come to me, and have complained of their inability to get consistent figures ; but on inquiry I have found their glasses not clean, or the mode of depositing the drop unsteady. In one case I saw a gentleman drop the liquid from a height of *ten* or *twelve* inches. I may also remark that in the case of fixed oils, it is of no use placing a second drop after the first one has failed, for in such case, the second drop either simply flattens, or in the case of some essential oils presents a beautiful example of the spheroidal condition of liquids at ordinary temperatures.

With some other volatile oils a second drop will displace the film formed by the first and produce a second cohesion figure on the same surface. With respect to the ethers, alcohol, etc., it is different: each drop forms a sharp and well-defined figure, lasting only about a second, and hence the best way of exhibiting such figures is to have the liquid in a dropping-tube, and allow drops to fall in regular succession on the surface of the water, by which means a regular succession of figures may be kept up and their characters studied. Here is some of Dr. Morson's creosote. A drop placed on the surface of two ounces of water forms a highly characteristic figure, sailing about with a vibratory, crispating edge. In the course of seven minutes this drop becomes gradually disposed of by solution; or in other words, the adhesion of the water completely overcomes the cohesion of the liquid, and diffusion spreads it through the mass of the liquid. A second drop may now be placed on the same surface. It exhibits the character of the first figure in a mitigated form; it is less active; it is disposed of by solution in 12½ minutes; a third drop is disposed of in 25 minutes; a fourth drop ceases to give a cohesion figure at all: it is not disposed of after 110 minutes. In fact, the two ounces of water are saturated: that is, the adhesive force of the water and the diffusibility of the creosote are destroyed. Increase the quantity of water, and we restore the adhesive force and diffusibility in proportion to the quantity, and the struggle between the water and the creosote sets in again with the characteristic figure. Here is a specimen of carbolic acid. The figure is very different from that of creosote, and its duration is very much less. And here it may be noted that some of the figures of oils, etc., are very durable, remaining on the surface for hours; and even among volatile oils the characteristic portions of some of them remain for a long time.

The strong adhesion between water and an oil may be shown by taking a slice of one of the seeds of the castor-oil plant and throwing it on the surface of clean water, when it will rotate feebly, after the manner of camphor on the surface of water, in consequence of the oil which diffuses from it over the surface in one direction producing rotation by reaction in another direction; but after a few turns the oil becomes equally diffused all round, and the motion ceases. Castor-oil seeds are heavy, they partly sink in cold water, and slices sink rapidly in hot.

The oil that escapes from the seed upon the surface of water does not form its cohesion figure. To get this we must allow a single drop to descend gently near to the surface of clean water, and the result will be a figure of extraordinary beauty. The drop will flatten into a disk, from which there will proceed a number of perfect iridescent rings, showing most of the colors in Newton's seven series; but beyond, and bounding these rainbows, is a broad silvery corona of exquisite delicacy, which almost immediately breaks up into a charming lace-like pattern, which I have feebly attempted to represent on the diagram before you. These effects last some seconds, but gradually the color disappears, the lace-like pattern follows, and a large colorless disk, with a well-defined edge, is left on the surface of the water. It undergoes some change, due to atmospheric exposure, but remains permanent for hours.

Such is the figure produced by the various specimens of castor oil that I have examined. They are of different growths, but are I believe all pure, and supposing the specific gravity of all these specimens to be about 0·969 there is no reason why their cohesion figures should not resemble each other at about 60° F., which I take to be the mean temperature of an inhabited apartment both in winter and in summer. There are obvious reasons, with a viscid oil like castor, and other oils that are sensitive to cold, why this test should be applied at a genial temperature. Some of the animal oleines, for example, are solid at about 40°. These may be perfectly fluid in a warm room, but if water be brought in from a cistern at 40°, and be poured into the test-glass, the drop, as soon as it is deposited, will be chilled, and even become opaque, and the experiment fail; so that attention to temperature is important.

Another precaution refers to extent of surface. By increasing this we increase the adhesive force, and the figures may be poor and thin, and even torn up, before their characters can be studied. I have found a surface of four or four and a half inches in diameter well adapted to this inquiry.

Now comes the question of admixture of oils. Castor oil is so abundant and so cheap that there is no great inducement, so far as I know, to mix it with an inferior oil, supposing one very much cheaper could be found. But let us imagine that lard oil, for example, were wanting employment in the market, and that as a secondary product it could be obtained cheaply,—could the admixture be detected by this method of cohesion figures? My answer is, that in all the cases of admixture which I have examined, the features of the two oils are manifest in the cohesion figure; and these are, in general, very distinct, if the standard figure be examined by the side of the suspected figure. My memory is sufficiently retentive of these figures to enable me to tell immediately whether a figure varies from my standard. Not that my standard is necessarily the correct one; because in all cases I have had to depend upon others for the integrity of my specimens; and, in like manner, the gentlemen who have supplied me, may in their turn have to depend upon others. So that the production of an undoubted specimen is not always easy, unless prepared at home, which is also not always easy. At the International Exhibition I often watched the process of crushing linseed and expressing the oil; and I obtained specimens of the product, including the seeds. Now, thought I, I have an undoubted specimen of linseed oil; but on examining the seeds they were found to be mixed with about *one-fifth* of other seeds, so that my specimen of linseed oil from this source could not be relied on. Other circumstances may modify the cohesion figure, such as differences in the climate, or in the season under which a crop is gathered. Thus, oil of lavender varies somewhat in specific gravity in different years from the same farm, and I have observed that the beautiful carrageen-moss pattern produced by this oil is more minute in some specimens than in others; but the pattern is still the same, in the sense that the Queen's head is the same, whether seen on a sovereign or on a half-sovereign.

In general, when there is an admixture of oils the characters of the two figures appear at once. Thus, olive oil has its cohesion figure; oil of sesame, with which it is often mixed, has quite another figure; a mixture of the two in various proportions will give a figure which is neither that of olive oil nor of sesame, but giving the characters of both, leaning of course to the side of that which is in excess. In some cases, however, the characters of the added oil do not at once appear, and this is the case when lard oil is added to castor. The figure opens in the same beautiful manner, and goes through its lovely phases, with a difference, it is certain, that requires a practised eye to detect; but there is no difficulty in detecting the lard oil among the residual phenomena of the experiment. Outside and beyond the castor-oil figure, we have numerous small blotches of lard oil, which are entirely absent from the residual phenomena of the pure castor-oil figure. I have selected lard oil as being the most common source of admixture; I suppose as much as ten per cent. might be added without greatly reducing the viscidity of castor oil. Doubtless any large admixture, if it were worth while, of olive, nut, etc., oils, would be at once seen by the increased fluidity of the castor oil; but I do not imagine any difficulty in detecting these oils in the mixture, their nature, and even amount (roughly) by means of their cohesion figures.

I do not give diagrams of the figures produced by these various admixtures. The subject requires an education of the eye, which is soon completed, as far as the figures are concerned, for any one who works at the subject; and no one can work at a subject long without getting that technical kind of familiarity which no books or graphic illustration can supply.

Croton oil furnishes a magnificent cohesion figure which may be represented as a very enlarged pattern of that of castor oil. Whether a small admixture of croton oil, such as one per cent. with castor oil, could be detected by means of the resulting figure, I am not yet prepared to say. I think there is no difficulty in detecting five per cent.

Oil of turpentine forms a very characteristic figure. It flashes out on the surface of water into a large well-defined film, the edge is marked by a double row of small bosses, the outer being the smaller; in the course of a few minutes irregular patches of iridescent color appear on the surface, the film then becomes perforated by a multitude of minute holes, and the fourth and final stage is an exceedingly delicate resinous network, which is very permanent. Oil of turpentine is, I am told, sometimes mixed with castor oil as a vermifuge. It is perfectly easy to detect the admixture by means of the cohesion figure.

I fear I have left myself but very little time for any remarks on balsam of copaiba. The readiness with which this substance unites with the oils, both fixed and volatile, renders an easy and reliable test desirable. A drop of the pure balsam spreading out with its cohesion figure on the surface of water is a magnificient sight. It consists of a succession of sharply cut, expanding, superposed disks, glowing with the most brilliant iridescent colors, of a lustre all but metallic. These disappear when the adhesion of the surface is satisfied, and a clean, sharply defined, colorless disk is left on the surface.

Now I am told that balsam of copaiba is often mixed with castor oil in various proportions, to the great embarrassment of the medical practitioner. He is taught by the older Pharmacopœias to shake up the balsam with alcohol; but as castor oil is also soluble in alcohol, the test is worthless. The magnesia test is troublesome, and a drop on writing paper almost equally so; but a drop on the surface of water, so far as I have examined it, instantly detects the admixture. The castor-oil figure has narrow iridescent rings, and a wide and beautiful lace border; the balsam figure has wide rings, a clean cut edge, and no border; but curiously enough, the mixture of the balsam with the castor oil gives a figure with no color, and a scanty perforated border.

I have not tried this experiment with various proportions of castor oil. Indeed, my object to-night is not to lay before you a finished work, but rather to invite attention to the subject, and to court inquiry and examination. When I brought this subject before the British Association at Manchester two years and a half ago, my object was rather scientific than practical. I wished to establish the principle that cohesion asserts itself in the case of liquids in the production of definite figures, as it does in the case of solids in building up crystals. The principle has, I believe, been admitted; but I have made no great progress in its practical application, partly from the difficulty I have had in procuring pure specimens, and partly, I suppose, from my preference for scientific inquiry, rather than practical application.

In conclusion, I must thank Professor Bentley for a very good specimen of wood oil, which I believe has been imported as East India copaiba. It makes a very good figure, a sort of inferior copaiba figure on a small scale; but it cannot for a moment be mistaken for copaiba, or any other figure that I am acquainted with. I have not tried the effect of it when mixed with copaiba, nor have I had an opportunity of examining jatropa oil, which is sometimes mixed with copaiba. There can be no difficulty in detecting admixtures of turpentine by this method.

I must also take the opportunity of Professor Miller's presence here to-night, to thank him for the warm interest which he has taken in this subject from the first. He witnessed my earliest experiments, and it is owing to his encouragement and advice that I have been induced from time to time to push on with the inquiry.—*London Pharm. Journ., March*, 1864.

THE TOOT-POISON OF NEW ZEALAND.

By W. Lauder Lindsay, M. D. and F. R. S. Edin., F. L. S., etc.

During a tour through the New Zealand provinces in 1861–62, the writer was struck with the abundant evidences which everywhere presented themselves of the ravages produced among the flocks and herds of the settlers by the *Toot-plant*, one of the most common indigenous shrubs of those islands. In many cases of losses by individual settlers brought under his notice, the amount from this source alone had been from twenty-five to seventy-five per cent. In Otago particularly were such losses felt during the height of the gold mania, from July to December, 1861: the traffic between Dunedin and Tuapeka gold-fields requiring the service of large numbers of bullocks, a great proportion were lost by Toot-poisoning. In colonies which as yet, at least, have depended for their prosperity almost solely on pastoral enterprise, such losses form a material barrier to prosperity; and the concurrent testimony of the colonists in every part of New Zealand proves the great desirability of determining the nature of the Toot-poison, the laws of its action on man and the lower animals, and its appropriate antidotes or modes of treatment. With a view to assist in the attainment of these aims, the writer has made notes, on the spot, of a large number of instances of the poisonous or fatal action of the plant on man—adults as well as children—and the lower animals, and had brought specimens home for chemical examination. The chief results of his investigations may be thus stated:—

1. The Toot-poison belongs to the class of *Narcotic-irritants.*

a. Its action on man includes the following symptoms:—coma, with or without delirium; sometimes great muscular excitement or convulsions, the details differing in different individuals; during convalescence, loss of memory, with or without vertigo.

b. In cattle and sheep, they include vertigo, stupor, delirium, and convulsions; curious staggerings and gyrations; frantic kicking and racing or coursing; tremors.

2. The poisonous portion of the plant,

a. To man, is generally the *seed,* which is contained in a beautiful, dark purple, luscious berry, resembling the blackberry, which clusters closely in rich pendant racemes, and which is most tempting to children; occasionally the young *shoots* of the plant, as it grows up in spring.

b. To cattle and sheep, in almost all cases, is the young *shoot,* which is tender, and succulent, resembling in appearance and taste the similar state of asparagus.

3. The following *Peculiarities* exist in regard to the action of the Toot-poison:—

a. A predisposition must exist, such predisposition being produced in cattle and sheep by some of the following conditions or circumstances:—The animal is *not habituated* to the use of the plant; it suddenly makes a large meal thereof after long fasting, or long feeding on drier and less palatable materials, or after exhaustion by hard labor, or hot, dry weather. From some such cause the digestive system is deranged, and is susceptible of more serious disorder from the ingestion of food to which the animal is, at the time, unaccustomed. Hence Toot-poisoning frequently occurs in animals which have just been landed from a long and fatiguing sea-voyage, during which they have been underfed or starved, to whom the young Toot-shoots present the most juicy, fresh, pleasant diet.

b. On the other hand, the same kind of animals, *habituated* to the use of the Toot-plant, not only do not suffer at all, but for them it is regarded as quite equal in value to, and as safe as, clover as a pasture food. It is an equal favorite with cattle and sheep, whether they have been habituated or not.

c. The predisposition in man is probably produced by analogous conditions depressing the tone of his nervous and digestive systems, or directly deranging them. *Children* are affected out of all proportion to *adults.*

d. Adults who have suffered from the poisonous action of Toot under certain circumstances have been exempt from such action under certain others,—the same parts of the plant having been used, and apparently in the same way, in both sets of instances. Moreover, the Toot-berries enjoy, both among the Maoris and colonists, an enviable notoriety on account of the agreeable and harmless wine and jellies they are capable of producing, the former whereof especially has long been greatly prized. The *seeds*, however, in these cases probably do not enter into the composition of the said wine and jellies.

4. The current *Remedies* for Toot-poisoning among the settlers are, in regard to—

a. Cattle and sheep—mainly bleeding, by slashing the ears and tail. Belladonna has been variously tried, and favorably reported on; by others, stimulants are regarded as specifics (carbonate of ammonia, brandy, or a mixture of gin and turpentine, locally known as "Drench"). Whatever be the nature of the remedy, there is no difference of opinion as to the necessity for the promptest treatment, since, at a certain stage of the action of the poison, *all* remedies appear equally inefficacious.

b. In man, the nature of the remedy is still more varied, though emetics and stimulants seem the most rational of those usually had recourse to.

5. The *Toot-* or *Tutu-*plant is the *Coriaria ruscifolia,* L. (the *C. sarmentosa,* Forst.) The plant is variously designated by

Maoris and settlers in different parts of the New Zealand islands; and this of itself indicates how familiar it is, and how abundantly and widely distributed. The genus *Coriaria* is a small one, and, if not belonging to a sub-division of the Natural Order *Ochnaceæ*, probably represents a separate Order closely allied thereto and to the *Rutaceæ*. The most distinguished botanists, however, are at issue as to its precise place and alliances in the vegetable system. They are in similar dubiety as to the *species* of the genus, and the *varieties* of the species *C. ruscifolia*, L. In New Zealand there appear to be at least three *Coriarias*, which some botanists regard as mere varieties of *C. ruscifolia*, L., and others consider separate species. The writer had made, in July, 1862, an examination of all the species of the genus *Coriara* contained in the Hookerian and Benthamian Collections at Kew, the result whereof was a strong conviction of the necessity for a critical revision of the whole genus, throughout all its species, wherever distributed. The writer considers the specific names of the Toot-plant (both *ruscifolia* and *sarmentosa*) objectionable, as not truly applicable or descriptive; and proposes the specific term *C. tutu*, the Maori name of the plant, as more convenient to indicate the *type* of the species, leaving such terms as *ruscifolia*, *thymifolia*, and *sarmentosa*, to represent varieties or other species, as a subsequent critical examination of the genus may render necessary or desirable.

In contrast to, and in connection with the toxic action of *C. ruscifolia*, the writer may remark on the better-known poisonous properties of *C. myrtifolia*, familiar as an adulterant of senna, and on those of other species of the genus *Coriaria*.* He

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* *Coriaria myrtifolia* is known in New Grenada under the name of the "Ink-plant," and the following letter respecting it, from Dr. Jameson, of Quito, was read recently at a meeting of the Linnean Society:—

"I am anxious to have Dr. Hooker's opinion of the 'Ink-plant.' There is a tradition here respecting this vegetable-juice that merits attention. It happened, during the Spanish Administration, that a number of written documents, destined to the mother-country, were embarked in a vessel, and transmitted round the Cape. The voyage was unusually tempestuous, and the documents got wetted with salt water. Those written with common ink became nearly illegible, whereas those written with 'Chauchi' (the name of the juice) remained unaltered. A decree was thereupon announces his belief that the whole genus *Coriaria* must be considered endowed with poisonous properties, probably of the narcotico-irritant class, and that, as such (especially in reference to the extent and importance of the economic losses caused by such species as Toot), it is eminently deserving of thorough scientific investigation.

Under this head he may point out the fact that—

a. While certain animals seem to be themselves exempt from, or insusceptible to, the action of the poison, they may, by feeding upon certain species, or certain parts of some species of *Coriaria*, and thereby assimilating or secreting the contained poison in their tissues, communicate poisonous effects, or become poisons, to man or the lower animals, to which they (the animals first mentioned) have become articles of diet. He would cite a recent instance in connection with *C. myrtifolia*, in which several persons near Toulouse were poisoned by a dish of snails which had been fattened on its leaves and shoots.

b. That Royle, in reference to the fruit of *C. Nepalensis*, Peschier, of Geneva, in regard to *C. myrtifolia*, and other authorities in regard to other species of *Coriaria*, have published instances of their *harmless* or even *beneficial* effects, under certain circumstances, on man or the lower animals. Such conflicting statements would appear to indicate that there are peculiarities in the action of the poisonous principles of all the *Coriarias*, or discrepancies in the records of instances of the said action, which discrepancies or peculiarities demand reconciliation or explanation at the hands of competent scientific experts.—*Pharm. Journ., Lond., February*, 1864, from *Proceedings of the British Association.*

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issued that the Government communications should in future be written with the vegetable juice. . . . I do not vouch for the correctness of this statement, but I have constantly heard it repeated from different sources. I generally use this ink in preference to the commercial article, as it is not so apt to corrode the steel pen. The present note is written with it, and has no admixture whatever, being only yesterday expressed from the fruit. When newly written, its color is reddish, becoming black after a few hours."—ED. PHARM. JOURN.

DR. McMUNN'S ELIXIR OF OPIUM.

A correspondent from this city has furnished the Philadelphia *Medical and Surgical Recorder* with the following recipe, which, he says, was found among the effects of the late Dr. Chilton;

"1. Take five pounds of Turkey opium, cut in small pieces and dried, and put it into a large strong glass jar with a wide mouth, and pour on it sulphuric ether enough to a little more than cover it; then stop the jar tight with a glass stopple to prevent its evaporation; set it away in a cool place, and stir it daily with a stick so that all the lumps may be broken. At the end of a week drain off the ether, and again pour on as much more, and repeat stirring it every day for a week longer, when it may be drained off as before. Then stop the jar tight, and lay it down on its side so that all the ether that accumulates near its mouth may be drained off, and repeat doing so until the opium is all dry. Then expose it to the open air for a few days.

"The sulphuric ether extracts from the opiumt he *Narcotine*, which is its most deleterious principle, and also deprives it of its peculiar noxious odor, so that the elixir will not smell of it thereafter.

"2. Now to free the opium of the smell of the ether, and to extract its valuable medicinal principles, boil it in water, as follows: Pour into a tin boiler four gallons of pure soft water, and when hot (but not boiling) put in the opium, when a great ebullition will take place, which is owing to the evaporation of the ether. Then let it boil ten or twelve minutes, occasionally stirring it so that the lumps of opium may be all broken and dissolved. Then set it away till the next day, when it should be strained through a cloth strainer, and if there be not four gallons of the solution, pour on the leached opium boiling water enough to make that quantity when it is strained and clear.

"When in the state of watery solution, it is better to be kept in stone crocks that will hold about two or three gallons each, and in a cool place as a cellar; after standing five or six days the clear solution should be carefully dipped off into a large tin can. The skimmings and dregs should be strained, and when clear put with the other.

"3. To this four gallons of watery solution, add five and a half gallons of alcohol, and stir the mixture thoroughly; then cover the can tight so as to prevent evaporation. After standing a few days, the clear elixir may be carefully dipped off into another can, and the dregs at the bottom strained, and when clear poured into the other.

"Now, after standing undisturbed for a few weeks it will be fit to use. It will be equivalent to laudanum, both in its strength and the size of its dose."

It was, doubtless, upon receiving this knowledge of making the preparation, that Dr. Chilton was induced to give the following testimonial:

"Dr. John B. McMunn, having made known to me the process by which he prepares his "ELIXIR OF OPIUM," and wishing me to state my opinion concerning it, I, therefore, say that the process is in accordance with well-known chemical laws, and that the preparation must contain all the valuable principles of opium, without those which are considered as deleterious and useless. J. R. CHILTON, M. D., Operative Chemist, &c."—*Am. Drug. Circular.*

INDIGENOUS DRUGS.

Now that almost every article of foreign production costs at least twice as much delivered in New York as it was sold for by the London dealer, the question naturally arises—Is there no possibility of our superseding articles necessarily imported from abroad by American productions, thus reducing the now enormous cost of drugs to the consumer, and restoring the greatly reduced profits of the dealer? Against the attempt to bring in an indigenous plant for use in medicine, the traditional reputation of the old and long tried *remedies* is constantly arrayed. The writings of physicians of half a century ago still furnish the staple of much of the teaching in our schools, and our text books are occupied with elaborate descriptions of remedies, some of which are now rarely attainable, while their reputation is perhaps chiefly due to their having been "known to the ancients." The absurd adherence of our Pharmacopœia to scammony as an ingredient of our leading popular chathartic pills is an illustration of this conservatism, the practical operation of which is, that some of the officinal formulas are ignored by nine of every ten of the manufacturers who furnish our preparations; and the prices which pharmaceutists can afford to pay with a view to the popular demand being far below the possibilities of the case, we can no more blame the deficiency upon the manufacturer or upon the pharmaceutist than upon the physicians or consumers themselves.

It is the misfortune of almost every good thing to be damaged by our zealous advocates, and it happens that, owing to the existence of the sect of so-called Eclectic physicians, who seem to have founded their system of practice upon the narrow idea that a medicine must be of vegetable origin, and even that it must have grown on American soil, to merit their approval, the true importance of many of our indigenous remedies has gained ground but slowly. The empirical processes of the Eclectic manufacturers, by which the attempt is made to reduce all the indigenous remedies to a uniform form of preparation, unwarranted by a scientific appreciation of their varied composition, has also stood much in the way of their reputation. Many of the so-called concentrated remedies are far from representing the drugs from which they were obtained; and any estimate of the therapeutic value of those drugs founded upon experiments with the Eclectic resinoid principles obtained from them, is liable to mislead in regard to their real use and adaptations.

We believe that with scientific pharmaceutists mainly rests the work of bringing the numerous American drugs which are readily obtainable, and many of foreign origin which are capable of easy propagation on our own soil, to a fair trial upon their merits; and we would suggest that every effort in this direction is not only a good business move, but tends directly to promote the prosperity and independence of our own country, and to diffuse its rich and useful productions throughout the world. —*Am. Drug Circular.*

ON THE DECOMPOSITION OF IODIDE OF MERCURY.

By H. Rose.*

Iodide of mercury is very easily decomposed by cyanide of potassium. To estimate the mercury in the iodide the following process may be adopted. The cyanide of potassium is first rubbed in a mortar with twice its weight of quicklime. A little carbonate of magnesia is then placed in a tube closed at one end;

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*Poggendorff's Annalen, bd. cxviii., s. 165; Bulletin de la Société Chimique, January, 1864, p. 25.

the iodide mixed with eight or ten times its weight of the cyanide, and lime is next introduced; then a layer of the cyanide and lime is added; and lastly, a little carbonate of magnesia is placed on the top; the tube is now drawn out and bent, and the extremity is made to dip into a receiver containing water. Heat is now applied to the mixture, beginning at the top, and the mercury distils over.

Other mercuric compounds may be decomposed in the same manner.

According to Carius, iodide of mercury is completely decomposed by digestion with nitrate of silver in a not very acid solution. The reaction is definite enough to allow of its being utilised for an estimation. Iodide of silver, like iodide of mercury, is slightly soluble in nitrate of mercury.

The red iodide of mercury may be reduced by a solution of protochloride of tin, but the reduction is not complete. With an excess of hydrochloric acid the reduction is impossible, and the iodide becomes yellow when the mixture is heated. When, however, the mixture is supersaturated with potash, the reduction takes place. Iodide of potassium will also prevent the reduction with protochloride of tin, unless an excess of potash is present.

Metallic zinc completely decomposes iodide of mercury in the presence of water, forming iodide of zinc.—*Lond. Chem. News, February* 27, 1864.

ON A NEW METHOD OF ANALYSING OIL CAKE.

BY W. B. TEGETMEIER.

Some time since I was requested to examine the products and report upon the process of a new method of extracting oil from crushed seeds by means of bisulphide of carbon in place of pressure. I found that the oils obtained by this plan were of very superior quality, bright, free from albuminous and mucilaginous matters, and destitute of the slightest trace of the bisulphide.

The residuary mass of ground seed was also much more free from oil than that left after pressure.

Being desirous of verifying my own opinion, I forwarded a sample of the crushed seeds after extraction to professor A.

Church for his analysis. His report of its composition was as follows:—

Water	10.23
Oil	4·70
Starch, mucilage	35·63
Albuminous compounds, containing 5·153 of nitrogen	32·29
Indigestible fibre, cellulose	9·45
Ash	7·70
	100·00

Thus proving that much more oil was extracted by the chemical than by the mechanical process in general use, ordinary rape cake containing sometimes as much as 12 per cent. of oil, and linseed cake a much larger quantity.

So efficacious is the bisulphide in extracting oil from organic matters, that it is even superior to ether in this respect, and Professor Church informs me that he has adopted it as a cheaper and preferable means of analysis.

Thus the same sample of linseed cake under the old ether process gave 16·57 per cent. of oil. But treated in a precisely similar manner with bisulphide of carbon it afforded 16·79 per cent of oil.

The cost of ether in the analysis of oil cakes is so great that the suggestion of this efficacious substitute by Professor Church is one of very great practical importance, and I have therefore much pleasure in bringing it under the notice of the readers of the *Chemist and Druggist*, as there can be no doubt but that it is equally applicable to determining the amount of oil in any other seeds or in organic matters generally.

PHYSIOLOGICAL PROPERTIES OF NITRITE OF AMYLE.

Dr. B. W. Richardson read a paper on this subject before Sub-section D, of the British Association. He first described the mode of manufacture and the chemical properties of the nitrite, and then passed on to the physiological action. The first remarkable fact was that the nitrite when inhaled produced an immediate action on the heart, increasing the action of the organ more powerfully than any other known agent. As the action of the heart rises, the surface of the skin becomes red, and the face assumes a bright crimson color. A little of the nitrite was here placed on a piece of bibulous paper, and passed round to show the effect on the face, and the effect was most remarkable, causing the faces of the persons who smelt the vapor to become instantaneously flushed. Carried to an excessive degree, the nitrite excites the breathing, and produces a breathlessness like that caused by sharp running or rowing. On animals, when the agent is given in large quantities, death is produced. The author at first thought that the nitrite, like chloroform, would cause anæsthesia; but experiments had shown that this view was not borne out. Animals would, it is true, lose consciousness; but when such a stage was reached, great dangers resulted, owing to the slowness by which the poison was removed from the body after its absorption. On the blood the nitrite produces darkness of color, but it does not materially interfere with coagulation in the body. In the lungs it excites congestion, and in the brain slight congestion. It causes no severe spasm and no sickness. After entering into certain other details, Dr. Richardson proceeded to say that the most remarkable effect produced by the nitrite was that in the lower animals—frogs, for instance—it led to suspended animation, which could be maintained for so long as nine days with perfect after-recovery. This fact was of curious historical interest. The ancients, especially Theophrastus (Paracelsus), had stated that there was a poison which, when taken one day would not take effect until some future day. This statement, long considered as a myth, had within the present year been shown to be true by Dr. Letheby, who had discovered a poison which really produced this phenomenon. In like manner the ancients had an idea that there were medicines which would for a time suspend life. The proceeding of Friar Lawrence in giving the distilled liquor to Juliet, was based on this old fiction, or shall we not say fact? The next point discussed by Dr. Richardson had reference to the mode of action of this poison. Were the effects produced through the blood, or by the nerves direct? The speaker said that he had been led to the conclusion, from previous experiments, that all poisons were brought into action through the blood; but this very commonly accepted theory did not explain the immediate and powerful action which follows the exhibition of the minutest dose of the nitrite of amyle. He thought, therefore, that the action was immediately on the nervous system, and that such action, transferred to the filaments of nerves surrounding the arteries, paralyzed the vaso nerves, on which the heart immediately injected the vessels causing the peculiar redness of the skin and the other phenomenon that had been narrated. Dr. Richardson, in conclusion, said that nitrite of amyle, like to chloroform twenty years ago, was only to be considered a physiological curiosity. It might by its action suggest the cause of trance, and of what was called hysterical unconsciousness, and it might explain the mode by which certain analogous substances produced their effects on the organism. It had been suggested—naturally suggested—that in fainting, as from loss of blood or from fear, the inhalation of the nitrite of amyle might be of service. He (the author) did not, however, at the present moment recommend its use in medicine, because of the intensity of its action. This last point was at the present time under his inquiry, and he would report further results at the next meeting of the Association.—*Am. Jour. Med. Sciences, April,* from *Med. Times and Gaz., Sept.* 26, 1863.

ELECTRICAL PROPERTIES OF PYROXILINE-PAPER AND GUN-COTTON.

Prof. John Johnson, of Wesleyan University, has called my attention to a remarkable power in pyroxiline-paper of producing positive electrical excitement in sulphur, sealing wax, &c. His note is as follows:

Wesleyan University, Middletown, Dec. 24, 1863.

PROF. SILLIMAN—*Dear Sir:*—We are told by writers on electricity that sulphur, by friction with all other substances, becomes *negatively* excited; as cat's fur, on the other extreme, by friction with all other substances becomes excited *positively.* But a few days ago I made the discovery that sulphur by friction with paper pyroxiline (I will call it) is excited with positive electricity, as are also sealing wax, amber, &c. The paper is prepared in the same manner as gun-cotton, which would also in all probability be found to possess the same property.

Inclosed please find some of the paper for trial. It was prepared by my son, M. M. Johnston.

Perhaps you will think the matter of sufficient importance to make a note of it in the Journal of Science.

Respectfully yours, JOHN JOHNSTON.

I have repeated and confirmed Prof. Johnston's experiment, extending it to gun-cotton. I find, as he suggests, that the latter substance produces the same excitement of positive electricity which is produced by the pyroxiline-paper. The most energetic effects are produced when vulcanized india rubber is the electric. The opposite effects in this substance produced by flannel and the gun cotton or pyroxiline-paper are very striking, and will form a good lecture room illustration. These substances also produce powerful positive excitement in glass. It is difficult from the use of pith balls alone to determine which produces the most powerful excitement, glass or hard rubber, when excited by gun-cotton or pyroxiline-paper. This seeming anomaly, confounding our ordinary means of discrimination in cases of electrical excitement, demands further investigation. It would appear that of negative electrics yet observed, these azotized species of cellulose are the most remarkable—in comparison with which the most highly negative electrics hitherto known become positive.—*Silliman's Journal*, Jan., 1864. B. S., JR.

A NEW HÆMOSTATIC.

Dr. Janssens has called the attention of the Brussels Medical Society to a new hæmostatic proposed by Professor Piazza, of Bologna. Repeated experiments have shown him that the alkaline chlorides render the clots formed by perchloride of iron much more compact, more homogeneous—in a word, more fibrinous. Hence M. Piazza has conceived the idea of mixing solutions of perchloride of iron and pure chloride of sodium, as in the following formula: Pure chloride of sodium, 15 *grammes;* neutral solution of perchloride of iron (30 degrees), 25 *grammes;* distilled water, 60 *grammes.* The chloride of sodium is dissolved in the water; the solution is then filtered, and the perchloride of iron is added. It is said that this hæmostatic has been successfully employed in St. John's Hospital at Brussels by MM. Rossignol and Janssens. It is not liable to produce violent local irritation, the perchloride of iron being diluted, while its efficiency is not impaired.—*Am. Journ. Med. Sciences, Jan.*, 1864, from *Bull. Général de Thér.*, 15 *Aug.*, 1863.

GOLD FIELDS OF NEW ZEALAND.

The gold discoveries in New Zealand, more particularly in the provinces of Nelson and Otago, are rapidly extending. In Nelson some very rich deposits have been found in the river Mangles, and the diggings on the rivers Buller and Wangapella are proving rich in the precious metal. The great drawback to the satisfactory working of the Nelson goldfields consists in the almost entire absence of roads. The country is very broken, extensive thickly wooded gorges and rugged precipitous mountains interposing enormous difficulties in the way of communication. The Nelson people are now seriously contemplating the construction of a railway to traverse the districts known to be rich in gold, copper and coal. The Coromandel goldfield, in Auckland province, languishes under the effects of the war raging in that province, and most of the miners have left until quieter times. Gold mining in Otago has, for the last three months, been seriously interrupted by the severity of the winter. But the worst part of the season is is now over, and warm genial days have latterly prevailed. Mining operations are, in consequence, reviving in every direction, and the goldfields' population is in high spirits. Many new discoveries have recently been made, and the areas of the goldfields are rapidly extending. A new goldfield, about seventy miles from Dunedin, in a north-easterly direction, was discovered about three months ago, and about 5,000 persons are settled there, doing remarkably well. It is confidently anticipated that the ensuing season will prove a very brilliant one. The quantity of gold produced by the Otago goldfields during the current year is 405,831 oz., and the export of the precious metal, 450,595 oz. In New South Wales there has been no further development of the goldfields, and trade is rather dull. The most expansive part of the trade just now is the development of the coalfields. Many new mines have been opened, and the competition has led to a reduction in price, as well as to an improvement in quality.—*Journ. of the Soc. of Arts, Nov.* 20, 1863.

NEW PROCESS FOR SILVERING GLASS.

By M. A. Martin.

Among the large number of processes for silvering, Drayton's process is the best adapted for telescope glasses; but, as this process requires great skill on the part of the operator, I have endeavored to find some method, which, by its simplicity and sureness, might become general. After carefully studying and experimenting on all the known processes (aldehyde, sugar of milk, glucosate of lime, &c.), I have arrived at one, which, from its simplicity and the firm adherence of the layer of silver deposited, seems to fulfil all the necessary conditions. I begin by preparing :—1. A solution of 10 grammes of nitrate of silver in 100 grammes of distilled water. 2. An aqueous solution of pure ammonia, marking 13 degrees on Carter's areometer. 3. A solution of 20 grammes of pure caustic soda in 500 grammes of distilled water. 4. A solution of 25 grammes of ordinary white sugar in 200 grammes of distilled water. Into this pour 1 centimetre cube of nitric acid at 36 degrees, boil for twenty minutes, to produce the interversion of the sugar, and then make up the volume of 500 centimetres cube with distilled water, and 50 centimetres of alcohol at 36 degrees. This done, I prepare an argentiferous liquid by pouring into a flask 12 cubic centimetres of the solution of nitrate of silver (1), then 8 cubic centimetres of ammonia at 13 degrees (2), then 20 centimetres of the solution of soda (3); and lastly, make up a volume of 100 centimetres by 60 centimetres of distilled water. If the proportions have been properly observed, the liquid will remain limpid, and a drop of solution of nitrate of silver will produce a permanent precipitate; then after being left quiet for twenty-four hours the solution is ready for use. Clean the surface to be silvered with a cotton plug impregnated with a few drops of nitric acid, then wash it with distilled water, drain and place it on supports on the surface of a bath, composed of the argentiferous liquid, to which has been added one-tenth or one-twelfth of the solution of sugar (4). Under the influence of diffused light the liquid becomes yellow, then brown, and after from two to five minutes the whole of the surface of the glass will be silvered; after ten or fifteen minutes it will have attained the required thickness; it must be washed first with ordinary water, then with distilled water, and stood upon its edge to dry in the air. The surface will then be covered with a light, whitish veil, easily removed by a little polishing rouge or chamois leather, leaving a brilliant surface perfectly adapted by its physical constitution for the purposes for which it was intended. —*Journ. Franklin Inst.*, *March*, 1864, from *London Artizan*, *Oct.* 1863.

FINE CLAY AS A DRESSING TO SORES.

Dr. Schreber, of Leipzic, recommends the use of clay as the most "energetic, the most innocent, the most simple, and the most economical of pallicative applications to surfaces yielding foul and moist discharges." He moreover considers that it has a specific action in accelerating the cure. Clay softened down in water, and freed from all gritty particles, is laid, layer by layer, over the affected part to the thickness of about a line. If it become dry and fall off, fresh layers are applied to the cleansed surface. The irritating secretion is rapidly absorbed by the clay, and the contact of air prevented. The cure thus goes on rapidly. This clay ointment has a decisive action in cases of fœtid perspiration of the feet or armpits. A single layer applied in the morning will destroy all odor in the day. It remains a long time supple, and the pieces which fall off in fine powder produce no inconvenience.—*British Med. Journal*, *April* 11, 1863, *p.* 381.

[We can quite corroborate Dr. Schreber's observations, having used fine clay poultices for several years—chiefly, however, in cases of local inflammation requiring the application of cold. Rags wet in water, or goulard water, so rapidly become dry and hot that the benefit from the cold application is completely lost. There is no dirt when the clay is enveloped in a piece of fine linen, and is not too fluid in consistence.—*Braithwaite,*] *from Am. Drug. Circular.*

Minutes of the Philadelphia College of Pharmacy.

The 43d Annual Meeting was held at the hall, 3d mo. 28, 1864. Present 20 members. The President in the chair.

The Minutes of the last Meeting were read and approved.

The Minutes of the Board of Trustees for the past six months were read by A. B. Taylor, Secretary of the Board. They inform us that George W. Eldridge has been elected a resident member of the College, and that the following Students of the School received the degree of Graduate in Pharmacy at the late Commencement.

Edward H. Buehler,	thesis on	*Helianthemum Canadense.*
Oliver Buss,	"	*Podophyllum Peltatum.*
Henry C. Croft,	"	*Rubus Villosus.*
John M. Cunningham,	"	*The Art of the Apothecary.*
Albert E. Ebert,	"	*Caulophyllum Thalictroides.*
Hiram Gold,	"	*Euphorbia Ipecacuanha.*
G. E. Jeannot,	"	*Acidum Benzoicum.*
Edward C. Jones,	"	*Leptandra Virginica.*
Samuel T. Jones,	"	*Sarracenia Purpurea.*
Joseph E. Moore,	"	*Menispermum Canadense.*
Henry B. Morris,	"	*Comptonia Asplenifolia.*
S. Mason McCollin,	"	*Urtica Dioica.*
Archibald C. McElroy,	"	*On Quackery.*
Alfred W. Newton,	"	*Myrtle Wax.*
George W. Notson,	"	*Rubus Villosus.*
Christian Schultheis,	"	*Sodii Chloridum.*
J. Henry C. Simes,	"	*Prinos Verticillatus.*
Edwin Thomas,	"	*The Ordeal Bean of Calabar.*

A vacancy has occurred in the Board by the resignation of William Evans, Jr., from membership in that body.

Charles Murray, Esq., of Buenos Ayres, previously nominated, was now, on ballot, unanimously elected to honorary membership in the College.

The Publishing Committee made their annual report, showing an improvement in the financial prospects of the American Journal of Pharmacy, and that, notwithstanding the increased cost of issuing it, the Journal will be continued in the same form and size as heretofore, without further encroaching upon the funds of the College.

The accounts of the Label Committee were also submitted.

The Committee on the Sinking Fund reported a farther reduction of the debt of the College.

Obituary notices, prepared by the Committee on Deceased Members, were read, commemorative of Dr. John Redman Coxe, Dr. Franklin Bache, Dr. Franklin Scammon, Dr. Robert P. Thomas, Frederick Brown, Samuel Sheppard and Theodore Dilkes. They were referred to the Publishing Committee.

Wm. C. Bakes presented, on behalf of the contributors to a fund subscribed for the purpose, imperial photographs of Daniel B. Smith, Peter Williamson, Charles Ellis, Elias Durand, Samuel F. Troth and Dillwyn Parrish, suitably framed for the walls of the College hall.

On motion of T. S. Wiegand, the thanks of the College are tendered to Mr. Bakes, for his interest and perseverance in carrying out this design.

A silver medal of the *Societé de Pharmacie*, of Paris, was presented to the College for preservation among its archives, by Alfred A. B. Durand, to whom the thanks of the College were voted.

The Annual Election was now ordered, and resulted in the election of the following:

President.
Charles Ellis.

First Vice President.
Samuel F. Troth.

Second Vice President.
Dillwyn Parrish.

Treasurer.
Ambrose Smith.

Corresponding Secretary.
William Procter, Jr.

Recording Secretary.
Edward Parrish.

Trustees.
Dr. Robert Bridges,
T. Morris Perot,
John M. Maisch,
Samuel N. James,
Samuel S. Bunting,
Thomas S. Wiegand,
Daniel S. Jones,
James T. Shinn,
John C. Savery, for the unexpired term of Wm. Evans, Jr., resigned.

Publishing Committee.
Charles Ellis, J. M. Maisch, A. B. Taylor, E. Parrish and W. Procter, Jr.

Committee on Sinking Fund.

Samuel F. Troth, Ambrose Smith, Edward Parrish.

Delegates to the American Pharmaceutical Association.

Edward Parrish, Evan T. Ellis, Wm. Procter, Jr., Alfred B. Taylor, Charles Bullock.

OBITUARIES.

Dr. John Redman Coxe was born in Trenton, New Jersey, on the 16th of September, 1773. His education was commenced under the charge of his grandfather, Dr. John Redman, one of the most eminent physicians of his day, and the first President of the College of Physicians of Philadelphia. Early in life Dr. Coxe was sent to Europe to complete his education, and enjoyed the advantage of medical instruction at the University of Edinburgh, though he completed his studies in Philadelphia under the distinguished Dr. Benjamin Rush, and graduated in 1794 in the University of Pennsylvania. He afterwards revisited London, Edinburgh and Paris, with a view to perfecting himself in the requirements of his profession, and on his return located in Philadelphia for practice. During the first trying visitation of yellow fever in 1793, he was actively engaged in the practice of his profession, though not yet a graduate of medicine, and on its second appearance in the city in 1798 was made physician to the port. He was for several years physician to the Pennsylvania Hospital, and also of the Philadelphia Dispensary. In 1809 he was elected Professor of Chemistry in the University of Pennsylvania, from which chair he was transferred to that of Materia Medica in 1818, to be succeeded in 1835 by Dr. Wood. Dr. Coxe was a pioneer in Pharmacology, having issued an American Dispensatory in 1807, which passed through a number of editions, and was largely in use for many years. Among his contributions to this branch of medicine, Lactucarium may be mentioned as having been first brought into view as a narcotic medicine by him. His "Hive Syrup" is everywhere known as a domestic remedy, and has been officinal in the U. S. Pharmacopœia since the issue of the first edition in 1820.

In the introduction of vaccination into the United States he bore an active part, issued a work on the subject in 1800, and is said to have been the first to practice it in Philadelphia. His literary works were numerous; the last, regarded as a monument of learning and industry, was an Epitome of the works of Hippocrates and Galen. This translation was published in 1846, when he was about 72 years of age.

Dr. Coxe was elected an honorary member of this College in 1824. For a long period he has led a life of retirement, having survived most of the contemporaries of his early life, lived to see vast progress in the city of his adoption and in his native land, and great changes in the theory and practice of medicine. He enjoyed remarkable exemption from disease throughout his long life, and died of old age on the 23d of March, 1864.

Dr. Franklin Bache was born in Philadelphia in 1792; he was directly descended from the eminent statesman and philosopher of our Revolutionary era, Dr. Benjamin Franklin, being his great grandson. He was educated in the University of Pennsylvania, in which he graduated, first as a Bachelor of Arts, and afterwards, in 1814, as a Doctor of Medicine. After three years spent in the army, first in the capacity of Surgeon's mate, and afterwards as surgeon, he returned to practice in his native city, occupying at sundry times the position of Physician to the Walnut Street Prison and the Eastern Penitentiary. It was not, however, in the capacity of a medical practitioner that he was destined to attain eminence; his talents and inclination led him into the walks of science. As early as 1819 he issued his first work, entitled a System of Chemistry for the use of Students of Medicine. In the year 1826 he commenced his career as a public lecturer on Chemistry in the Franklin Institute of the State of Pennsylvania; from this position he was called, in 1831, to take the position of Professor of Chemistry in this College, Dr. Wood having been transferred to the chair of Materia Medica. It is among the chief boasts of this Institution that, in its own early history, before its school of Pharmacy had become extensively known, it was the means of bringing together in its faculty two men so eminently qualified to be pioneers in developing those branches of knowledge connected with its peculiar sphere of usefulness. For ten successive winters Dr. Bache lectured to the then small classes which met in this hall to receive instruction in Materia Medica and Chemistry, and in Pharmacy as taught incidentally by the two professors.

It was at the beginning of the year 1833 that the U. S. Dispensatory appeared, the joint work of Drs. Wood and Bache; it immediately took high rank as a clear and accurate treatise upon drugs, and following immediately on the Pharmacœpia, then just beginning to be appreciated as an authoritative standard, aided much in giving currency to its formulæ, and establishing it in the esteem of the Medical and Pharmaceutical professions. It would be impossible to estimate the influence of this work, in educating and informing the mass of those concerned in the sale, preparation and administration of medicines; it has undergone eleven revisions, and has been disseminated not only throughout our own country, but in Europe and elsewhere.

In 1841 Dr. Bache resigned his professorship in this College to accept a similar position in Jefferson Medical College, which he occupied to the time of his death. In the several Pharmacopœal Conventions he was engaged as an important member, and in that of 1860 was appointed Chairman of the Committee of Revision, which met at his residence in this city, and during over one hundred meetings carefully considered every detail of the work, and issued it in its present improved form. Dr. Bache was not without many evidences of the appreciation of his fellow-citizens, and especially of the medical profession; he was an Ex-President of the American Philosophical Society, Vice President of the College of Physicians, and President of the Managers of the Deaf and Dumb Asylum of this city; from some of these bodies and from the Faculty of Jefferson College, it may be supposed, memoirs will emanate, which will more fully perpetuate his character and services to the cause of science and humanity. We have deemed it fitting that our records should show our appreciation of one, whose connection with our College has been a source of unalloyed satisfaction, and whose example and precept have been productive of such important effects upon our profession. Dr. Bache died on the 19th of March, 1864.

Dr. Franklin Scammon was born in Whitefield, Lincoln County, Maine, October 23d, 1810. We first know of him as an apothecary and chemist, in Hallowell, Maine, where he practiced our art, devoting at the same time much attention to the Natural Sciences. He subseqnently studied medicine, graduated in Philadelphia, and returned to Hallowell to practice. Following the tide of emigration, he removed to Chicago about the year 1850. He was engaged in varied business pursuits, at one time manufacturing linseed oil. His taste for the Natural Sciences was a controlling element in his character, and led him to devote the last few years almost to Botany and kindred pursuits. He was elected President of the Chicago College of Pharmacy on the organization of that Institution, and was recently chosen Professor of Botany in the University of Chicago; his botanical collection was extensive and valuable, and he is said to have been an able professor. He was an associate member of this College. His declining health, for several years past, had cast a shadow over his pursuits, and on the 10th of February, 1864, he passed from earth.

Dr. Robert P. Thomas was born in Philadelphia on the 29th of May, 1821. His father, Daniel J. Thomas, and his mother, who was a daughter of Robert Pennel, of Chester County, Pennsylvania, were descended from early settlers of this Commonwealth, and were members of the Society of Friends; both parents survive him.

The boyhood of Dr. Thomas was chiefly spent in his native city, where, for a time, he was a pupil in the Friends' Academy, Fourth below Chestnut Street, in which, since its establishment in 1689, many of the prominent citizens of Philadelphia have been educated. He was afterwards sent to Westtown Boarding School in Chester County, another old and famous institution of the Society of Friends. Here he gained a good English education, with the rudiments of classical learning, and doubtless acquired that taste for natural science which was conspicuous in his later career.

When about sixteen years of age, he entered the counting house of

Walters & Souder, shipping merchants, to whom he proved a valuable assistant; but his ambition, early directed toward the medical profession, led him to employ the hours usually devoted to recreation in enlarging the boundaries of his knowledge, and developing those faculties which were to be so usefully employed in after life. While engaged in mercantile pursuits, he acquired a knowledge of the French language, and commenced the study of medicine under the tuition of Dr. George Fox.

In order to promote his medical education, he obtained the appointment, in 1846, of Assistant Apothecary to the Philadelphia Dispensary, a position he filled for a year, with great fidelity and satisfaction to all with whom he was associated. In the year 1847 he took the degree of Doctor of Medicine in the University of Pennsylvania.

Dr. Thomas must have had his full share of those discouragements which await the young physician during the years which, in a large city, invariably intervene between the period of graduation and the time in which his talents and industry may win for him an honorable reputation and an independent support. No special good fortune surrounded his entrance upon his chosen career, and he was dependant upon his own indomitable energy and perseverance, with the encouragement of strong friends, for the degree of success to which he attained.

In the Franklin Medical College, established by Dr. P. B. Goddard, James B. Rogers, J. B. Biddle, Meredith Clymer and others, and promising a career of honor and success, Dr. Thomas obtained the position of Demonstrator of Anatomy, giving him an opportunity to perfect himself in a favorite science, and, as he doubtless hoped, of realizing substantial pecuniary advantages and professional reputuation. This college, however, was unable to compete with the older and more celebrated schools, and soon was abandoned. We have no accurate data as to his many essays designed to render available his energy and industry, and to promote advancement in the profession to which he had devoted himself, but can trace him throughout, as a laborious, enterprizing, zealous student and practitioner, giving ample promise of the success which ever attends upon those qualities, when combined with integrity and purity of character.

In 1849 he married Sarah, daughter of John Bacon of this city. His widow, survives him, with a family of three children, deprived thus early of a father's care.

In 1850 the chair of Materia Medica in this college having been vacated by the election of Professor Carson to a similar position in the University of Pennsylvania, Dr. Thomas became a candidate, and, recommended by his many sterling qualities, was elected to fill it. He immediately entered on the duties of his office with characteristic zeal, and from the first fulfilled its requirements to the entire satisfaction of all. With the class he was popular, from the clearness of his instructions, the urbanity of his manners, and the genuine goodness of his heart; to the members of the College, who came in contact with him at its meetings and elsewhere, he attached himself closely in relations of confidence and friendship.

In the investigation and illustration of his subject, Dr. Thomas was indefatigable, and while he added to his own cabinet, he enriched also that belonging to the College. The first literary labor of Dr. Thomas, after entering upon the practice of medicine, was the translation from the French of the first edition of Caseux's Midwifery, a work which has since gone through three editions, and become a standard treatise on that subject. His writings, published in *The Journal of Pharmacy*, in the proceedings of the American Pharmaceutical Association and elsewhere, evince close observations and analysis, and are written with clearness and perspicuity. Of these we may specify his paper on Texas Sarsaparilla, published in our Journal in 1855, showing that this drug is not identical with the true Sarsaparillas; his paper on Garlic, published in the proceedings of the American Pharmaceutical Association for 1860, describing a variety of this drug found in the Philadelphia Market, and which he concludes is not a distinct species, but a hybrid, partaking of the nature of the garlic and of the leek; and a short essay on the Culture of Elaterium, in the Volume of Proceedings for 1862,—all exhibiting evidences of his talent and industry in the special department of Pharmacology.

Some interesting experiments on the influence of morphia in the color-test for strychnia, detailed in a paper published in the *American Journal of Medical Sciences*, were exhibited by him at one of the Pharmaceutical Meetings of this College in 1861. The presence of morphia was shown to modify the color-test for strychnia, as first ascertained by Dr. J. J. Reese, so as to render it quite unreliable for medico-legal investigations, as usually applied, and the admirable expedient suggested of isolating the strychnia from the morphia, where they are associated, by the use of chloroform in the presence of an excess of caustic potassa, thus avoiding the interference in cases requiring the test.

The most extensive editorial labors of Dr. Thomas were connected with the revision of Griffith's Universal Formulary and Ellis' Medical Formulary. Both these works were originally edited by Professors of this College—the former, by Dr. R. Egglesfield Griffith, appeared in 1850, some years after he had left this institution, and was re-edited by Dr. Thomas in 1854, who enlarged it by the addition of 70 pages of new matter, and improved it by original modifications.

Ellis' Formulary had passed through nine revisions before Dr. Thomas became its editor; he twice revised it, and it was the last literary effort on which he was engaged, the eleventh edition having been published but a few weeks before his death. In this work, which taxed his powers during the past winter, there is much to remind us of his mental traits, and a degree of completeness and accuracy which gives it value as a standard work of its kind.

From early life Dr. Thomas was of a serious and conscientious turn, and averse to the frivolities which are so apt to engross the young. In March, 1853 he attached himself to the Episcopal church, and was an active member of the vestry, and warden of Grace Church at the time of his decease.

In the year 1857 he was elected one of the attending Surgeons to the Episcopal Hospital, and was ever active and vigilant in the discharge of the serious duties attending his position in this institution. It was here that his character as a Christian physician prominently attracts our notice. While ministering to physical ailments he did not neglect suitable opportunities of directing the attention of his patients to the One Source from which alone resignation and strength in suffering can be derived. The officers of the Hospital have borne willing testimony to his patience, gentleness, and kindness in the discharge of his professional services.

The death of Dr. Thomas was sudden and very unexpected. He lectured to his class in this College on the evening of the first of February, apparently in health, and rather unusually lively and full of anecdote. By those nearly connected with him, however, it was observed that he appeared not as well as usual, and on the following morning, although he rose, he complained of symptoms which induced him to forego his usual round of duties, and very soon after to retire to bed. Alarming symptoms soon appeared, which called for prompt efforts to stay the progress of a disease which was rapidly loosening his hold on life. Every effort failed, and in thirty-six hours from the first appearance of the disease, his spirit passed away. A subtle epidemic influence, which has visited many of our citizens during the past winter, and has been generally characterized as spotted fever, is believed to have undermined thus rapidly his vitality without developing its usual visible signs.

Thus in the forty-third year of his age—in the full strength of manhood—with energies unrelaxed, and girded with the strength of experience for future usefulness—our associate, friend and preceptor, has been called from among us. In the language of the Rev. Bishop Potter at his funeral, "though he had attained to but little more than two score years, yet, with his Christian earnestness of purpose, he had lived full long enough to accomplish the great mission of this life."

Frederick Brown was born in Philadelphia on the 12th of March, 1796. His paternal ancestors were among the English followers of William Penn; his mother was descended from a French family of Calvinistic faith, who fled to Holland and thence to this country, to escape persecution at the hands of the Romish Church. His early education was among Friends, and he continued to attend their meetings until some years after his majority, when his interest was transferred to St. Andrew's Episcopal Church, which he attended for more than 35 years.

At the early age of sixteen he was placed "apprentice" to Charles

Marshall, first President of this College, whose name stood prominent among the Apothecaries and Druggists of Philadelphia in that day, and whose store, in Chesnut Street above Second, was the frequent resort of many of the leading physicians and citizens. Here Frederick Brown remained for ten years, having obtained the confidence of his employers, and been promoted to the chief management of the business. On his determining, in 1822, to embark in business on his own account, he was proffered a loan by these friends of his youth, which aided him much in establishing himself at the location which has been, for so many years, connected with his name—a loan which his very first year's business enabled him to repay. This act of kindness, added to the many incidents of their intercourse, produced in Frederick Brown a warm attachment for the several members of the family of Marshall, whose memory he cherished, and whose virtues constituted a favorite subject of conversation with him in later life. On a recent occasion, when recounting the incidents of his youthful days, he completed a warm eulogium on the character of his dear old friends, Charles and Patience Marshall, with the assertion, which in this presence will well bear repetition, that "few nobler men ever lived than Charles Marshall."

His father died in 1815, and from this time, when he was but nineteen years of age, the care of his mother and younger sister devolved entirely upon him; from this exercise of filial love in his youth, he experienced the strength derived from early restraints upon self-indulgence, and devotion to high and noble duties, and in after life acknowledged himself a better man on this account.

In 1833 he married Charlotte Augusta Hoppin, of Providence, R. I., a companion with whom he lived in much harmony, his interests centering strongly in his home. His wife, daughter and three sons survive him, and the oldest son, a graduate of this College, bears his name, and succeeds to his large and prosperous business, at the north-east corner of Fifth and Chestnut Streets. This location is almost within the shadow of Independence Hall, and was connected with the administration of our government during the Presidency of Washington. The summer residence of Frederick Brown was at Burlington, N. J., where he had ample opportunity to gratify his taste for horticulture.

Though of latter years not actively engaged in the affairs of this College, we find, by reference to its Minutes, that he was one of the Committee appointed at the original meeting in Carpenter's Hall, February 23d, 1821, who, at the second meeting, held March 13th, brought forward the Constitution, which was the basis of the organization of this College. He was also elected one of the first Board of Trustees.

His connection with the Pennsylvania Hospital, as one of its Managers, continued for 23 consecutive years; during this time that noble Institution has undergone vast improvement and extension, and the Department for the Insane has been built upon a scale which has made it one of the finest monuments to the philanthropy and public spirit of Philadelphia. In all these improvements and in the management of the Institution, Frederick Brown has had an active part, and his warmest interest and sympathy have been called forth in its behalf.

As one of the founders of Laurel Hill Cemetry, his name will long be connected with the improvement of our city. His attention appears to have been attracted to the utility of rural cemetries by visiting Mount Auburn, in the vicinity of Boston, in 1833. Soon after, a public meeting was held in this city to consider the subject, at which about 70 attended; at a second meeting the attendance had dwindled down to about 30, and the final meeting consisted of Frederick Brown, John Jay Smith, (formerly a member of this College,) and Benjamin W. Richards; these three associated into a company, to which Nathan Dunn was afterwards added, and they proceeded to purchase the property, and lay out the grounds which now constitute the far-famed Laurel Hill.

In 1858, his daughter being advised to seek a restoration of health in foreign travel, his arrangements were directed to a European tour: one objection only presented; his aged mother, then in her 89th year, having lost her mental vigor and become physically helpless, had so long been an object of his care and solicitude that he could not willingly leave home, lest he might lose the opportunity of himself closing her eyes, and laying her under the sod. Yielding to his apparent duty as a father, he had written to secure a passage by the most popular of the Liverpool steamers. The hour had arrived for his final determination, but his feelings overcame his reason. "I have thus far fulfilled my whole duty toward my mother," said he, "and I am in doubt if I ought to leave her now; I think no harm will come if I wait awhile." So he gave up the stateroom with the further remark, "Perhaps I may see my way clear to reconcile these opposing claims." That very day, on arrival at his summer home, he found his aged mother speechless from paralysis, and three days afterwards he closed her eyes in death. The journey was now accomplished—his daughter restored to health—and many pleasant memories treasured to be recalled throughout the remainder of his life.

In the autumn of 1863 his health failed. Distressing and enervating nausea seemed his chief symptoms, which increased upon him daily. No remedies seemed capable of arresting the progress of his disease, which was cancerous; and yet, from the testimony of those surrounding him, he never uttered one impatient exclamation or repining thought. During some months his illness progressed, till, on the 26th of February, he remarked that death was very near, and with calm cheerfulness bade farewell to wife and children, sisters and friends, without excitement. No fear of the future darkened his path into the valley of the shadow of death. His feelings near his close seemed much interested in the fate of our beloved country, and he said he had hoped to see the end of this foul rebellion. On the morning of the 27th of February, 1864, he breathed his last.

SAMUEL C. SHEPPARD was born on the 7th of Third month, (March,) 1803, at Greenwich, Cumberland County, New Jersey. Prior to 1820 he came to Philadelphia, and was placed with Thomas McClintock, then the proprietor of the store in South Ninth Street, (now 207,) to acquire a knowledge of the business of Druggist and Apothecary. When he attained his majority he obtained the situation of Apothecary to the Pennsylvania Hospital, where he remained for about eighteen months, and on withdrawing therefrom entered into business on his own account, at the store in which he had been an apprentice. This old stand, which thus became identified with his name, was kept by him as a retail dispensing store the remainder of his life, a period of near forty years. He changed, perhaps, less than most of the objects around him, and the march of improvement and enterprize left him rather in the rear, but his store still continued to enjoy a share of the patronage of the neighborhood. He was removed by death on the 7th of 10th month, (October,) 1863. He was a member of the religious Society of Friends. In the days of his pupilage the school of Pharmacy of this College was not fully organized, though it is believed he was among the first of its students. He became a member of the College in 1825.

THEODORE DILKES was born in New Jersey, on the 28th of October, 1835. He came to this city at about the age of seventeen, and entered the store of Henry M. Zollickoffer, at the corner of 6th and Pine streets, as an apprentice to the Drug and Apothecary business. Under the care of his experienced preceptor, one of the old and highly respected members of this College, he acquired proficiency in the business of his choice, and graduated in our school in the spring of 1856.

On the death of his employer he became his successor in business, and was elected a member of the College in 1858. He was happily married, and a prosperous future seemed before him, when the seeds of that insidious disease, pulmonary consumption, began to develop themselves, and an illness of nearly three years, during one year of which he was prevented from attending to his business, terminated in death, on the 26th of November, 1863. A consistent member of the Methodist Church, his attention had long been turned to those interests which are eternal.

Editorial Department.

American Pharmaceutical Association.—It has been usual to publish the announcement of the Annual Meeting in the May number of this Journal; but as the President has not sent us the notice, we presume he has concluded to postpone it until the July issue. Meanwhile we would suggest to those of our readers who owe service to the Cincinnati meeting, that they take time early and prepare their papers.

The Professorship of Materia Medica.—At the meeting of the Board of Trustees of the Philadelphia College of Pharmacy, held April 5th, (1864), Edward Parrish was unanimously elected Professor of Materia Medica in the School of Pharmacy, to fill the vacancy occasioned by the death of Prof. R. P. Thomas. This Chair is one of great importance in the scheme of instruction conducted in the School, and involves constant vigilance to keep up with the progress of science and discovery. The wide scope and intrinsic interest which attaches to the history of drugs in their botanical and commercial relations, affords a field for the gratification of a laudable ambition, and brings the Professor into direct contact with men of science. We congratulate Professor Parrish on his unanimous election, and wish him a successful career as teacher of Materia Medica.

Pharmacy in Great Britain.—At the present time the Pharmaceutical body of England is in a great ferment, owing to the proposed introduction of a new Pharmacy Bill into Parliament involving the interests of all connected with the supply of medicines. It will be recollected that the existing Act in reference to the charter of the Pharmaceutical Society, and the subsequent grant giving the members of that Society the sole right to employ the title of Pharmaceutical Chemist, applies only to a small portion of the whole body of practitioners, most of whom are known as "Chemists and Druggists." Three years ago the latter, feeling themselves aggrieved, formed a National Association, started a Journal, and have been gradually gaining an influence by united action which is raising their status. The object of the bill appears to be to bring about a fusion of the two classes by requiring a registration of all Chemists and Druggists, and making it imperative on all "Chemists and Druggists" to undergo an examination before they can go into business, after the 1st of January, 1865. We have not space for the other features of the Bill, but propose in a future number to give an exposé of the progress of the movement.

NEW YORK COLLEGE OF PHARMACY.—At the annual meeting of the College held in March, 1864, the degree of Graduate in Pharmacy was conferred on George G. Sands, of New York; James J. Skelley, of New York; Joseph F. Figueron, of Havana; Emilio Villaverde, of Havana. Mr. Geo. C. Close, Vice-President, addressed the graduates in a pertinent speech on the duties which they undertook in becoming pharmaceutists.

A general election of officers of the College, to serve the ensuing years, 1864 and 1865, was then gone into, which resulted as follows: *President*, H. T. Kiersted; 1*st Vice-President,* Geo. C. Close; 2*d Vice-President,* John Milhau; 3*d Vice-President,* Isaac Coddington; *Treasurer,* Thomas T. Green; *Secretary,* P. Wendover Bedford: *Trustees,* George D. Coggeshall, John Carle, Jr., Wm. Neergaard, F. F. Mayer, Wm. Wright, Jr., J. W. Shedden, A. W. Gabaudan, F. Frohwein, B. E. Hays.

Delegates to the American Pharmaceutical Association, H. T. Kiersted, G. C. Close, J. W. Shedden, F. F. Mayer, P. W. Bedford.

MASSACHUSETTS COLLEGE OF PHARMACY.—At the annual meeting of the Massachusetts College of Pharmacy, the following named officers were chosen for the ensuing year: Thomas Hollis, President; Charles A Tufts, Samuel M. Colcord, Vice-Presidents; Henry W. Lincoln, Recording Secretary; James. S. Melvin, Corresponding Secretary; Ashel Boyden, Treasurer; George D. Ricker, Auditor; Trustees, Daniel Henchman, Joseph T. Brown, A. P. Melzar, R. R. Kent, Elijah Smalley, A. G. Wilbor, Isaac T. Campbell, James A. Gleeson,

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The British Pharmacopœia, published under the direction of the General Council of Medical Education and Registration of the United Kingdom, pursuant to the Medical Act, 1858. London: printed for the Medical Council by Spottiswoode & Co. 1864, pp. 444, octavo.

We have received a copy of this long looked for work, to which allusion has been frequently made, but our space will afford but a short notice of it in this number. In a prefatory chapter the reader is informed under what circumstances the British Pharmacopœia originated and replaces the three Pharmacopœias, heretofore in use in Great Britain and Ireland; and of the general plan of the work, consisting of two parts and an appendix. The greatest difficulty appears to have presented, in the Committee of Revision, to reconcile differences of opinion in regard to certain preparations, where the strength of the former preparations varied. In such cases the decision was generally in favor of the weaker preparation. The Committee have also attempted to "assimilate the strength of preparations of the same pharmaceutic form, in order that they may be prescribed in similar doses," but the reform in this direction was met by practical difficulties, which prevented the adoption of the principle systematically. The weights and measures, to be used in the new Pharmacopœia, early attracted the attention of the Committee, and they wisely determined to settle this point before proceeding with the construction or revision of the formulas. The Dublin Pharmacopœia having already adopted the avoirdupois weight, and the opinion in favor of having but one kind of weight for selling and mixing prevailing, was the cause of the adoption of the commercial weight for pharmacopœial purposes, but to avoid confusion, the only terms in which the weights of the Pharmacopœia are expressed are the grain, ounce and pound.

Our readers have already, by previous notices, been made acquainted with the facts bearing on this subject, (see vols. xxxiv. and xxxv.) and we will not further remark upon it, except to wish that our own Pharmacopœia Committee had been induced to adopt the same standard. The first part of the British Pharmacopœia, entitled *Materia Medica,* differs from all previous editions, of that and of our own, in giving under each head the characters of the substance, as well as tests for its purity. The following will give the idea:

"ACACIA. Gum Arabic.

One or more undetermined species of Acacia, *Linn.*

A gummy exudation from the stem; collected chiefly in Cordofan in Eastern Africa, and imported from Alexandria.

Characters.—In spheroidal tears from half an inch to an inch in length, nearly white, and opaque from numerous minute cracks, or in shining fragments; brittle, bland and mucilaginous in taste, soluble in cold water. The solution forms, with subacetate of lead, an opaque white jelly.

Test. The powder does not become blue on the addition of solution of iodine.

Preparation. Mucilago."

Another peculiarity of this part is the fact that it includes a large number of substances which are usually considered only in the second part of the book. For instance, spirit of nitrous ether and solution of acetate of ammonia are each in the officinal list, yet they are also among the preparations, and so of a large number of other preparations, more especially chemical substances. In some cases these short descriptions are useful in determining at once what the Pharmacopœia intends. Many of the tests appended seem wholly inadequate to determine the genuineness and purity of the drugs. Thus, Oil of Lemon is thus characterized:—

"Color pale yellow, odor agreeable, taste warm and bitter."

Others are peculiar, as that for Resin of Guaiacum, to which the following test is appended:—

"*Test.* A solution in rectified spirit strikes a clear blue color when applied to the inner surface of a paring of raw potato."

The reaction here is between the glutinous matter of the potato and the guaiac; and is a characteristic test. Whenever the chemical nature of the substance admits, its chemical formula is given. Thus, "Beberiæ Sulphas, sulphate of Beberia. The sulphate of an alkaloid, C_{38} H_{21}, NO_6, HO, SO_3, prepared from Beberu Bark.

Another peculiarity is the complete ignoring of the United States as a commercial source of drugs, which is intensely English. For instance, Guaiac wood is referred to St. Domingo and Jamaica; Kino to Malabar; Rhatany to Peru; Jalap to Mexico, but Tobacco is cultivated in America. Serpentaria from the southern parts of North America; whilst Senega, Sassafras, Podophyllum and Lobelia are all attributed to North America, and Canada Balsam, which is specially *North* American, is referred to Canada! It follows from this that, in British geography, North America is a country identical with the United States!

The second part of the work is occupied with the preparations arranged in classes in alphabetical order. There are no medicinal vinegars. Among the acids there are formulas for glacial Acetic, purified Arsenious, Citric. Hydrochloric, Nitric, Sulphurous, and Tartaric acids, besides others in our own codex. The formula for Aconitia is analogous to that in the U. S Pharmacopœia, but removes the fixed oil from the extractive matter and aconitia, by distilling off all the alcohol, diluting with water, and filtering when cold, instead of agitating with the evaporated liquid, a portion of Ether *after* sulphating it. The solid aconitia obtained by Ether is re-dissolved in acidulated water and precipitated by ammonia to get it in a pulverulent form. This prevents the disagreeable necessity of pulverizing the alkaloid. The continuous process for Ether is adopted, the product being afterwards purified and concentrated by agitation with quick lime and Chloride of Calcium. Benzoate and Phosphate of Ammonia are introduced; Tartar Emetic is called Antimonium Tartratum. All the medicated waters are made by distillation except camphor water, the recipe for which, half an ounce of camphor, broken into pieces and enclosed in a muslin bag, is retained for at least two days at the bottom of a jar containing a gallon of distilled water. Made in this way camphor water must be very much less active than when prepared by Hodgson's process with carb. magnesia, as in the U. S. Pharm. In the process for nitrate of silver, refined silver is directed, which in the appendix is stated to be pure metallic silver.

The process for atropia is the complicated one of Thein, and by no means so simple, and easy of execution, as that in the U. S. Pharm., in which the agency of chloroform is called in. Subnitrate of Bismuth is called *Bismuthum Album.* Calomel is called simply *Calomelas*, and is placed under this head, and not with the other mercurials.

We must here close for the present, and in a future number propose to continue this notice in reference to some of the more important preparations, more or less peculiar to British Pharmacy. The English Journals teem with severe criticisms of the British Pharmacopœia, and the professors of the Pharmaceutical Society have each been lecturing on it to large audiences of the members, showing up what are deemed its numerous imperfections.

OBITUARIES.

DR. FRANKLIN BACHE.

It is with deep regret we are called upon to record the death of Dr. Franklin Bache, who died at his residence in Philadelphia, after a short illness, on the 19th of March, in his 72d year. Dr. Bache, as a chemical teacher and writer, has been intimately connected with the progress of Pharmacy in the United States, and his last work as Editor of the United States Pharmacopœia, and as Chairman of its Committee of Revision, involved an amount of disinterested labor rarely extended by a single individual. Whatever he undertook was done well. Uncompromisingly strict in the reception of evidence, he adopted changes or suggestions with caution, and was highly conservative in reference to extending the boundaries of the Materia Medica. Notwithstanding this, he was easily approached with sound reasoning, and when convinced of the claims of a process or preparation, he gave it the full weight of his influence. It was our good fortune to have had Dr. Bache as chemical preceptor at the College of Pharmacy, and to have had many opportunities of observing his mental peculiarities in a long subsequent intercourse in labor connected with pharmacy. We never knew him to flag in the pursuit of duty, or to hesitate in giving his full attention to a matter, however troublesome, if it involved the accuracy or usefulness of the work in which he was engaged. It was this habit of accuracy more than anything else that gives value to his portion of the dispensatory, and has acquired for his writings the confidence of Pharmaceutists. As the necrological Committee of our College has, at page 276, given an official obituary notice, we will avoid further comment on the death of one for whom may justly be claimed a high place in the enduring memory of the pharmaceutists of the United States.

DEATH OF PROFESSOR EDWARD HITCHCOCK.

This distinguished scientific man died at Amherst, Mass., Feb. 27th, aged nearly 71 years; he was born at Deerfield, Mass., May 21st, 1793. Prof. Hitchcock's labors as a geologist, have placed his name among those who have materially aided in building up that great science; and as President of Amherst College his usefulness has been largely exhibited. In the language of Prof. Silliman, he was "earnest, simple and sagacious; indefatigable under all discouragements, his clear, firm grasp of truth sustained and raised him above all difficulties, and have secured him an honored name in science."

The death of Dr. Benjamin Cutter, of Woburn, will be deeply felt in the community of which he had so long been a prominent and valued member. He had been feeble for a considerable time before his death, but his last illness was of short duration. Dr. Cutter was born in West Cambridge in 1803, and graduated at Harvard College in the class of 1824. He studied medicine with Dr. Francis Kittredge, of Woburn. Many valuable contributions from his pen will be found in former volumes of this Journal.—*Boston Medical Journal.*

THE

AMERICAN JOURNAL OF PHARMACY.

JULY, 1864.

PHARMACEUTICAL NOTES.

By Ferdinand F. Mayer.

Japanese Lovage-Root.—A year or two ago the New York College received from one of its members a specimen of a so-called lovage-root, reputed to be of Japanese origin. A large quantity of this drug had been brought here from San Francisco, where it had been received as a shipment from Japan. No more information could be obtained of the dealers in regard to its origin; the house who purchased it, however, found considerable difficulty in disposing of the article, as a substitute for the ordinary lovage-root, and the greater part of it still remains unsold.

Lovage is employed to a considerable extent in the form of candy, or the root itself is chewed, principally for its aromatic properties, and also for its diuretic and emmenagogue virtues, especially by our colored population. Besides, the German apothecaries have occasional calls for it, as it preserves among their customers its ancient reputation for like purposes.

There are ordinarily to be found in the market the common *Radix Levistici* from *Levisticum officinale*, Koch (DeC. *Prod.*, iv. p. 164. Hayne, *Arzneygewæchse*, vii, t. 6. Woodville, *Med. Botany*, i. p. 141, t. 55,) which is imported, and an American root which, I have been informed by the dealer, is the same species cultivated in this country. In its general properties and anatomical structure this American root appears to be identical with the foreign; both are cut into longitudinal slices, have the same sponginess, caused by the empty vessels of the bark, and the opopanax-like odor. But while the main root of the imported kind is covered with horizontal wrinkles, the American shows none but longitudinal striæ; and it will require some more and very substantial evidence to allow us to admit that this difference was solely the result of acclimatisation.

With neither of these roots, however, has the Japanese drug any resemblance, being neither of a spongy consistence, nor of the odor or taste of Levisticum; and in absence of any clue to the origin of the plant or the name which it bears in Japan, I have at different times thought it not unlikely that the roots might be those of an *Imperatoria,* or of *Angelica sylvestris,* L. (Hayne, *l. c.* t. 9. Woodville, *Med. Bot.*, i. p. 89, t. 36,) of *Archangelica decurrens,* (Ledebour, *Flora altaica,* i. p. 316, *Icones,* tab. 166,) or of *A. peregrina,* Nuttall, (Torrey and Gray, *Fl. N. Am.*, p. 622, = *A. Gmelini,* DeC. Prof. A. Gray, *Mem. Am. Acad.*, new ser., vi. 377,) as being nearly related to Levisticum, and all of them plants of North America or Northern Asia. Yet, on examination, neither these nor the Umbelliferæ mentioned by Kaempfer, Thunberg, v. Sieboldt,* Hoffman and Schultes,† or by Prof. Asa Gray,‡ and in Walper's *Repertorium* and the *Annales Botanices,* gave indications which could be called satisfactory. Black's *Catalogue of Japanese Plants,* an appendix to Hodgson's *Japan,* I have been unable to procure.

A better promise offered a notice of what I must presume are these identical roots in Mr. Hanbury's *Notes on Chinese Materia Medica,*§ where they are described under the names of *Yu-shuh* and *Chuen-Keung,* our drug appearing to be a mixture of both, supposing there be a difference between them. The description there given concurs so closely with the appearance of our own specimen, that it may serve our purpose here:

1. "*Yu-shuh,* root of a plant of the nat. ord. *Umbelliferæ?* Contorted fleshy roots, anteriorly about ⅜ of an inch thick, but lower down swelled into nodular tubers an inch or two in diameter,

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* *Verhandelingen Batav. Genootshap,* vol. vii. (1830). *Abhandl. Math. Phys. K. Baer. Ak.* iv. 134, (1846.)

† Index in *Journal Asiatique* of 1852.

‡ *Perry's Expedition,* vol. ii. 312. *Mem. Amer. Acad.* new series, vol. vi. 377.

§ *Pharm. Journ. Trans.* (2) iii. pp. 315, 316.

covered every where with a wrinkled, brown skin; internally they are of a pale rusty color, [moist* and] easily cut, and have an aromatic odor and sweetish aromatic taste.

2. "*Chuen-Keung;* referred to as '*Czuan-siun, Rad. Levistici?*' in Tatarinow, *Catal. Med. Sinens.*, p. 15.

Nodular masses consisting apparently of the rootstock of some umbelliferous plant allied to Angelica. The specimens are from 1¼ to 2½ inches in diameter, having a very irregular, rough brown, outer surface, and a pale yellowish brown, cavernous interior.† The odor of the drug resembles that of the root *Tang-Kwei*, (from *Aralia edulis*, Sieb. et Zuccarini, *A. cordata*, Thunb., *Dimorphanthus edulis*, Miquel, *Doku-quatz*, vulgo *Dosjen* by Kaempfer,) resembling that of Angelica and Celery."

Mr. Hanbury adds that a decoction of the roots described is taken by the Chinese women for some time previous to child-birth, it being reputed to alleviate its dangers.

This reference, together with a noticeable difference between the structure of these roots and that of umbelliferous roots generally, viz: the absence of rays in the cortical portion, which appears to be quite characteristic for several of our *Araliæ,* as those of *A. nudicaulis*, *A. hispida*, *A. quinquefolia,* and the shortened branches of the rhizoma of *A. racemosa* ([*Araliæ eduli*] *affinitate proxima* [Endlicher, *Enchiridion,* p. 394]) led me to search for a probable source of the root among the plants of the family of *Araliaceæ*, and without being at all sanguine in regard to it, I would make a suggestion, which I hope may be further examined into by a botanist.

Under the names of *Scutellaria prima*, *S. secunda* and *S. tertia*, Rumpf (*Herb. Amboinense*, vol. iv.) describes resp. *Aralia cochleata* (Panax cochleatum, DeC. Prod., iv. 263,) *A. pinnata* (P. pinnatum,) and *Aralia fruticosa* (P. fruticossum, Linn., Sp. Pl., 1513, DeC., Prod., iv. 254); of the latter plant a drawing is contained in *Andrews' Repository,* ix. pl. 595, from a living specimen cultivated in England.

The following is the quotation from Rumpf's description of

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* (Not in our specimen.)

† [A number of them arranged on a string passed through narrow holes.]

Scutellaria tertia, alluded to as probably applying to our specimen:

> "Totius fruticis sapor multo penetrantior est quam in ullis prioribus speciebus (viz: *A. cochleata, A. pinnata,*) magisque ad illum Petroselini adcedens, ita ut *Apium fruticans* posset haberi. Sapor autem gratissimus in ejus radicis detegitur, quæ maxime etiam in usum vocatur. . . . . Hæc planta non tantum hortorum ornamento inservit, sed præcipue in re medica adhibetur, atque ab incolis tanquam *Petroselinum* seu *Apium* in usum vocatur; ejusque folia ac radix virtutem habent diureticam, multo efficaciorem binis præcedentibus speciebus; simulque vel hæc sola aquæ incoquitur et propinatur in nephritide contra mictus dolorificos uti contra dysuriam, mictus cruentos, et gonorrhœam. . . . . . Simplex foliorum decoctum sæpius propinatum fuit in nosocomio hominibus nephritide laborantibus, quibus urinam vehementer expellabat. Decoctum istud tam radicis quam foliorum a mulieribus etiam adhibetur ad menstrua provocanda."

The last sentence certainly is not so much in support of my suggestion, nor do the names given by Rumpf convey a more definite information. But otherwise the descriptions agree, and the plant is universally cultivated at least in Amboyna, Java and China.

One of the roots described by Thunberg is the *Radix Ninsi* from *Sium Sisarum* var. *Ninsi* (DeC. *Prod.*, iv. 124. Thunberg, *Flora Japan*, p. 118. Kaempfer, *Amœn*, p. 818. Linn., *Icon. Plant. Med.*, 505. *Berle de Chine*, Lamark *Dict.* Th. F. L. Nees von Es. *Plant. off.* 284,) which in his time was imported from China into Japan, where it was used as a cordial and sold at the rate of 600 Thalers the pound. I mention this here because in Pereira's *Elements of Materia Medica*, Amer. edition, ii. Rad. Ninsi is given as one of the synonyms of Ginseng, the Japanese names of which, there being two varieties, are *Tjoosen-ninsin* and *Josino-ninsin.*

Jacca-nuts, from *Artocarpus integrifolia,* L.—Under the name of *Paradise-nuts* I have lately met with these at several fruit stores. They appeared to be altogether new to the several dealers, none of them being acquainted with the proper name, nor could the broker who sold them give any clue as to their origin, or had invented the name under which they were sold as not affording much information. From the fact, however, that the jacca or jack tree, together with other varieties of the breadfruit proper, is cultivated in the West Indies, I conclude that they were imported from one of the islands, though it is also within the reach of probability that they may have been carried here from the native countries of this species in the Pacific or Indian Oceans.

The Jacca* is a large tree attaining a height of 30 to 50 feet, and in its general character concurs with that of the true bread-fruit tree, (*Artocarpus incisa,* L.)

The fruit of this species, as well as of *A. incisa*, is the compound inflorescence of the pistillate flowers ripened into a syncarpium or compound berry. It is composed of numerous carpels, which are united at the base to the common fleshy receptacle forming the axis of the syncarpium, while their apices are connected and form the rough green rind or outer covering of the fruit; the rough points on the outside of the fruit of *A. incisa* being pyramidal or conical, while they are pentagonal or hexagonal in *A. integrifolia.* The shape of the latter fruit is ovate-cordate; it is from 12 to 30 inches long, by from 6 to 12 in diameter, and weighs from 10 to 90 pounds. As is the case with the bread-fruit proper, by far the larger number of ovaries prove abortive, and their perianths are gradually converted into a yellowish gelatinous pulp, which is the principally edible portion, and which is eaten in the same manner as the pulp of the other species, though its odor is stated to be repulsive. The sterile carpels become compressed into fleshy ligulæ, which surround the fertile ones. The latter, the fruits proper, are the nuts before us.

The pericarp is of the shape of a dried prune, but from two to four times its size, with a long ſ for its axis, somewhat triangu-

[*Artocarpus integrifolia*, L. Sex. Syst. *Monœcia Triandria.* Nat. Family. URTICACEÆ Jussieu. Ord. ARTOCARPEÆ Ad. Brogniart. Tribe. *Euartocarpeæ.* Subgenus, *Jaca* Trécul.—Linn. *Syst. Veget.* 838. Sprengel, iii. 804. Trécul, *Ann. Scienc. Nat.* 3me. S. t. viii. 109. Zollinger, Flora, 1847, p. 471.

Tsyaka maram s. *Jaca* s. *Jaaca*, Rheede, *Hort. Malab.*, iii. tab. 26–28. *Soccus arboreus* s. *Nanka*, Rumphius, *Herb. Amboin.* i. tab. 30--31. *?Polyphema Jaca* Loureiro, *Flor. Cochinch.* p. 546 [= *Artocarpus polyphema*, Pers. Trécul, l. c.] *Rademachia integra* Thunb. *Sitodium cauliflorum* Banks. Gærtner, *De Fruct.* i. 344, tab. 71, 72. *Artocarpus Jaca*, *Jaquier des Indes*, Lamarck. *Dict.* iii. 209.

Hooker, *Curt. Bot. Mag.* liv. 2833. Roxborough, *Pl. Corom. Coast*, 250. De Tussac, *Flore des Antilles*, ii. 4. Descourtilz, *Flore p. et méd. des Antilles*, t. viii. Lunan, *Hort. Jamaic.*, p. 388. Maycock, *Flor. Barbad.*, p. 346.]

lar or gibbous on one side; they are of a pale or reddish brown color without, with irregular furrows running not quite the whole distance from the scar to the apex, bony; within rusty and rather spongy, and marked with greyish, flattened vessels. A thin, pale brown arillus adheres more often to the shell than to the seed. The latter is smooth, kidney- or almond-shaped, covered with a fawn-colored skin, and consists solely of the embryo; in appearance and taste it resembles that of the Brazil nut (*Bertho lettia.*)

They are used by the inhabitants of the places where the tree grows or is cultivated, either raw, or roasted like chestnuts. Those of the fertile variety of *A. incisa* are the *Malabar chestnuts*, which are of a different appearance. Descourtilz states that in Jamaica the nuts of both species are used indiscriminately; those of the Jacca, however, are preferred as a substitute for almonds in medicinal preparations, especially for *Syrupus Emulsivus;* prepared, as required by the Pharmacopœia, with an emulsion of these seeds in place of almonds, it is said to be unchangeable, quite a desideratum in such a climate. He also mentions that the exportation of shoots or seeds from Jamaica, where it was introduced in 1782 by Lord Rodney, was prohibited. It is not likely that the tree can be raised from the seeds, since Tussac mentions that they lose their vitality within a few weeks after being taken out of the fruit.

Souari-nuts, from *Caryocar tomentosum*, L.*—The genus *Caryocar*, which, with the exception of one species established by Bentham, constitutes the order of *Rhizoboleæ*, comprises a number of South American nut-bearing trees known under the name of *Pekea*, *Peki*, *Souari*, *Souvarow*, etc.; the nut is also described by older writers as *Castanea Peruviana, Amygdala Guianensis, Amygdalus granatensis.*

The nut which is at present to be found in the fruit stores is, properly speaking, the *Tata-youba*, under which name the tree was

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[* Sex. Syst. *Polyandria tetragynia.* Nat. Ord. *Rhizoboleæ.* Subgenus *Pekea.* Willdenow, *Spec. Pl.* ii. p. 1244. Dec. *Prod.*, i. 600. *Tata-youba* s. *Pekea tuberculosa*, Aublet, *Guian.*, i. p. 597, t. 239. Lamarck, *Dict.*, iii. 33, *Encycl.*, tab. 489, 2, *Rhizobolus Pekea*, Gaertner, *De Fruct.*, ii. 93, t. 98.]

known in Guiana at the time of Aublet, It differs from the true Souari nut by the tubercular appearance of the shell, besides other differences in the outer coverings of the fresh fruit.[*]

The nut sells at too high a rate to be serviceable for ordinary purposes; besides the kernel, which, when sound is very sweet, is frequently destroyed.

Litchi, or *Ly-chee fruits*, from *Euphoria Litchi*, Desf.[†]—These handsome little nut-like fruits are seen here but rarely. Some dry specimens before us are of the shape and size of a large strawberry, somewhat compressed. They are an inflated, dry berry, with a brownish fragile shell studded over with small pyramidal, convex, or flattened tubercles; within there is a single hard, brown, tooth-like seed adnate to the base, and covered with a shrivelled pulp of the consistence and appearance of a large raisin. The latter is the edible portion, and possesses the taste of preserved quinces.

It is consumed to a considerable extent in China, etc., and

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[*] The other species of the subgenus *Pekea* with an edible nut is *C. butyrosum* (Willd., *Sp. Pl.*, ii. 1243. DeC. *Prod.*, i. 600. *Pekea butyrosa*, Aublet, *Guian.*, i. 594, t. 238. Lamarck, *Encycl.*, iii. 33, tab. 486, 1.

Of the subgenus *Saouari* the nuts occur under the same names from *C. nuciferum* (Willd., *Sp. Pl.*, ii. 1243. DeC. *Prod.*, i. 299. Hooker, *Curt. Bot. Mag.* liv. 2727. *Flore des Serres*, iii. 183, 184.

C. glabrum, Pers. (DeC. *l. c.* *Saouri glabra*, Aublet, *Guian.*, i. 599, tab. 240. *Rhizobolus Saouvari*, Corréa, *Ann. Mus. Hist. Nat.*, viii. 394, tab. 5, 2.

C. brasiliense, Cambess. (St. Hilaire, *Fl. Bras. Merid.*, i. 249, tab. 67,) and besides the remaining species described in the *Prodromus*, two new ones, viz:

C. edule Casaretto, *Decada Nov. Stirp. Brasil.*, viii. 67. Walpers, *Rep. Bot.*, v. 358; near Rio Janeiro, and

C. barbierve, Miq. (*Linnæa*, xxii. 802. In Bresil, Prov. Bahia.)

[†] Syn. *Dimocarpus Lichi*, Lour. *Scytalia chinensis*, Gaertner. *Scytalia Loacan*, Roxb. *Euphoria punicea*, Lamarck. *Sapindus edulis*, Aitk. *Nephelium Litchi*, Don.

Sex. Tyst. *Monœcia pentandria.* Nat. Ord. *Sapindaceæ.*

Linn., *gen.* 1425. Dec., *Prodr.* i. 611. G. Don., *Gardn. Dict.* i. 670. Lamarck, *Dict.* iii. 573, tab. 306. Aitken, *Hort. Kew.*, ed. i. vol. ii. 36. Gaertner, *De Fruct.* t. 42. Roxborough, *Hort. Beng.* p. 28. Louveiro, *Fl. Cochinch.* p. 233.

Du Halde, *Hist. Chin.* ii. 144. Sonnerat, *It. Ind.* ii. 230. Rees' *Cyclop.* xxxii. (Scytalia.)

also, I believe, to some extent, in the West Indies. The fresh fruit may be a more grateful article than in its dried state. It is used also to prepare cooling drinks in febrile and bilious affections.

New York, June, 1864.

ON CRYSTALLINE DEPOSITS IN EXTRACTS FROM ACONITE AND VERATRUM VIRIDE.

By Gustavus Krehbiel.

Among several preparations from different kinds of aconite root which I have been making for the use of my esteemed teacher, Prof. F. F. Mayer, in his examination of the active principles, was a fluid extract of an English aconite root of very superior quality.

The tubers were uniformly of a pale brown color within, and apparently unmixed with that of any other variety but that of *Aconitum napellus.* The fluid extract, by a misapprehension, was prepared with alcohol somewhat stronger than the officinal, and, on being allowed to stand for some days, it deposited a large number of well developed crystals on the sides and bottom of the vessel. To these Prof. Mayer called my attention, stating that the formation of crystals, especially those of some sugar, had been lately observed by Prof. Schroff of Vienna in several narcotic extracts, as those of helleborus and various species of aconitum; and under the impression those found by Prof. Schroff had been recognized by the same as glucose, the appearance of the crystals and an examination with Fehling's solution led him to assume that they were pure cane-sugar; while the fluid extract itself at once gave the reaction with the copper solution.

Some time after, I had occasion to prepare a concentrated tincture of Veratrum viride, in which I employed whole roots of the best quality, using alcohol of 86 per cent. Richter; and, shortly after finishing the preparation, there appeared in the bottle a deposit of smaller crystals, but of the same kind as those observed in the concentrated tincture of Aconitum napellus.

On communicating these facts to Prof. Mayer, he showed me a paper of Prof. Schroff in *Zeitung des Nord Deutschen Apothekervereins*, of August 18th, 1863, where precisely the same circumstance was noticed, and at his request I undertook the examination of both deposits. They were thoroughly washed with ether-alcohol. The crystals deposited from four fluidounces of the fluid extract of aconite (equal to four troy ounces of the tubers) amounted to about forty grains. They retained a brownish color, as I did not discolorize them with charcoal, to avoid a loss; they had the crystalline structure and the strongly sweet taste of rock candy, and gave no reaction with Fehling's solution, but, after being treated with a little diluted sulphuric acid, they at once deposited suboxyd of copper.

On incinerating the crystals in a platinum crucible there remained behind a noticeable quantity of a white ash, which proved to be *lime.*

The watery solution of the crystals, slightly acidulated with dilute nitric acid, on the addition of acetate of lead gave a very faint indication of a precipitate too small for examination. The latter reaction may be ascribed to the presence of coloring matter and not to aconitic acid.

The crystals recovered from the concentrated tincture of Veratrum viride (of which four fluidounces also correspond with four troy ounces of the root) amounted to about the same quantity as those of the tincture of aconite; they were colorless, but presented the same appearance and taste; they gave the same reaction with the solution of copper, and on calcination likewise gave a pure white ash consisting of *lime.* The watery solution of the crystals, when acted upon by acetate of lead, also showed an indication of a precipitate.

The deposits formed in this manner may therefore be assumed to be crystallized *cane-sugar*, with probably a small quantity of a compound of *sugar with lime*, which is of difficult solubility in alcohol.

The concentrated tincture of Veratrum viride, freed from alcohol, also reduced the copper solution without previous treatment with acid.

By the advice of Prof. Mayer I also examined some finely-developed crystals of rock candy, which gave precisely the same reactions and left the same white ash, which also proved to be lime; but on adding acetate of lead to a slightly acidulated aqueous solution of the crystals, I could not perceive any precipitate.

In the mean time I have had an opportunity of examining the paper of Prof. Schroff in the *Prager Vierteljahresschrift fuer die Practische Heilkunde*, 1854, 2er band, p. 129, and also his later treatise in *Schmidt's Jahrbuecher* about the varieties of aconitum.

The alcoholic extracts in which he notices the appearance of sugar, are of Aconitum lycoctonum (L.), A. anthora (L.) and A. neomontanum (Wulfen). Especially the alcoholic extracts of the roots collected in the fall yielded more sugar than the roots collected in the months of June or July, but the latter proved to be more active.

New York, June 7, 1864.

REMARKS ON SOME PREPARATIONS OF THE U. S. PHARMACOPŒIA, 1860.

By William Procter, Jr.

(*Continued from page* 209.)

Acetum Scillae. In remarking on preparations of this class in a previous paper, the practical error which crept into the formula for this preparation was passed accidentally unnoticed. The glutinous character of squill develops, even in a coarse powder, so much adhesiveness in the particles as to render the directions of the Pharmacopœia almost impracticable. It is better, therefore, to mix the squill with a pint of dilute acetic acid, as directed in the second formula of the Pharmacopœia of 1850, and, when the particles are thoroughly swollen by maceration, to put the magma into a glass conical percolator, settle it down by agitation and slight pressure, and pour on dilute acetic acid until two pints of vinegar of squill have passed.

Aconitia. The process for Aconitia is a modification of that of Headland, noticed in the Dispensatory, but differing from it by the precaution taken to remove the fixed oil and resin, by a preliminary washing by means of ether, after the aconitia has been sulphated, and before the addition of the ammonia. As this modern aconitia is not pure, it retains coloring matter, and, according to the recent discovery of the Messrs. Smith, of Edinburgh, another alkaloid, which they call aconella, and which they and subsequent experimenters believe to be identical with narcotina. The inertness of narcotina must materially diminish the power of aconitia, and the variable strength of the alkaloid of commerce may be partially due to this cause.

Æther.—In this formula, more alcohol is etherified by a given proportion of sulphuric acid, and the process is rendered definite and certain by directing the range of temperature at which it should be conducted, and, without attention to which, a much more alcoholic product may be obtained than is sought.

Æther Fortior.—In the Pharmacopœia of 1860 this is a new preparation, being ether of sp. gr. ·728, in which the ordinary ether is deprived of alcohol and water by agitation with chloride of calcium and quick lime in powder and subsequent distillation. In Dr. Squibb's apparatus for making ether, the product is obtained directly of the required sp. gravity, by passing the ether vapor through a series of condensers and washing arrangements, whereby the impurities are separated before it reaches the final refrigerating condenser. This ether is directed in the Pharmacopœia in the processes for aconitia, oil of wine, oleoresin of ginger, and for use in inhalation.

Chloroformum Purificatum.—Owing to the frequent impurity in commercial chloroform, the revisors of the Pharmacopœia deemed it safer to have a special name that should signify a pure preparation for inhalation. Hence the apothecary should know, when this chloroform is ordered, that it is intended for that use.

Oleum Æthereum—It should be remembered that ethereal oil is now a mixture of equal parts of ethereal oil and stronger ether, and, instead of being heavier than water, is of sp. gr. ·910 The addition of the ether is to give chemical permanency to the oil, which, in a pure state, undergoes chemical decomposition and turns black. It is, therefore, necessary to use twice as much of the new preparation in making Hoffman's Anodyne.

Aloe Purificata.—This formula is intended to meet a want sometimes occurring with commercial aloes. Yet the Pharmacopœia evidently does not lay great stress upon it, as the resulting preparation is not directed in any of the preparations of aloes.

Ammoniæ Valerianas.—This formula is that suggested by Benjamin J. Crew, (Amer. Journ. Pharm., vol. xxxii., 109), and is the best one yet published. The commercial valerianic acid is not always sufficiently concentrated for use in this formula, it must be monohydric to succeed, and the precautions directed to get the ammoniacal gas dry should not be neglected. The heat generated by the combination of the gas with the acid is sufficient to keep the salt liquid until saturated, when, on cooling, it becomes a loose crystalline mass. It is very desirable that the acid should be completely saturated, that the salt be as free as possible from valerianic odor, the salt possessing much less of this odor than the free acid. The manipulation requisite to produce this salt in the greatest perfection of purity, is only acquired by practice and familiarity with the process.

Antimonii Oxidum was formerly only known in the Pharmacopœia in the process for tartar emetic as oxychloride. Now, pure oxide of antimony is made an officinal preparation for use in tartar emetic or other purpose. It is an ingredient in Tyson's Antimonial Powder.

Antimonii Oxysulphuretum.—Under this name the Kermes of the Codex is now an officinal of our Pharmacopœia. It is, probably, the most active of the several forms of kermes, and may be made readily, in small quantity, over a gas lamp.

Antimonium Sulphuretum is the new name for the precipitated sulphuret of previous editions, and corresponds with the name in the British Pharmacopœia.

Aqua Ammoniæ, the old name of the 1st edition of our Pharmacopœia, has been re-adopted for liquor ammoniæ, and it is placed among the waters, in obedience to a resolution of the

Committee of Revision to arrange preparations under their several generic heads.

Aqua Chlorinii.—This formula is nearly that of the late Dublin Pharmacopœia, both in proportions and manipulation, as found in the Dispensatory.

Aqua Cinnamomi.—It should be remembered that the only oil of cinnamon recognized by the U. S. Pharmacopœia is the Ceylon oil, and that this is directed in cinnamon water.

Argenti nitras.—This formula is an improvement. The former recipe inferred the use of chemically pure silver. The present formula is so constructed as to rid the salt of all free nitric acid, and in case cupreous silver is used to reject the impurity almost wholly as oxide of copper, if the heat is managed carefully, the cupreous nitrate being decomposed by a temperature at which the nitrate of silver is intact. Nevertheless, the Pharmacopœia process is intended for pure silver, as seen by consulting the test in the list of the Materia Medica.

Atropia.—This is a new officinal, although in general use before the publication of the Pharmacopœia. The process is nearly that recommended by the author of this paper, in the proceedings of the Amer. Pharm. Assoc. for 1860. The recommendation in that paper to wash the sulphated liquor with chloroform to insure the entire removal of fixed oil and resin before adding the potassa, was not adopted in the Pharmacopœia process. This, in the absence of any subsequent purification, is liable to render the product less pure. The product of the Pharmacopœia process is, therefore, not pure atropia, but that alkaloid with some coloring matter, the removal of which the Committee deemed not of sufficient importance to justify the loss of product which would follow it. The loss of at least the greater part of the chloroform may be avoided by placing the chloroformic solution of atropia in a beaker glass suspended in water, in a small still, and applying a heat sufficient to vaporize the chloroform, which will be recovered by proper refrigeration. The propriety of not further purifying the crystals of atropia may be doubted, as from the direction to evaporate to dryness the exterior portion of the residual crystalline mass is more or less contaminated with matter held in solution by the chloroform, and which gives it a darker color than the other portion, and, consequently, there is a slight want of uniformity in the product. By recrystallization from a filtered alcoholic solution, a purer product is obtained.

Sulphate of Atropia is made by the process of Le Maitre, and is based on the fact that, whilst atropia is soluble in ether, its sulphate is not; and, hence, when the constituents are brought together in that menstruum, the resulting salt separates in a solid semicrystalline form the ether retaining any excess of acid or alkali. The former custom of physicians to prescribe atropia, and direct the apothecary to dissolve it in water by aid of a sufficient quantity of sulphuric acid, in some cases led to the production of an acid solution irritating to the eyes.

Bismuthi Subcarbonas.—The manipulation in this process is mainly to free the salt from arsenic. When bismuth contaminated with arsenic is treated by nitric acid, both metals are obtained in solution, the latter, probably, as arsenic acid. The filtered solution, on dilution, is converted into subnitrate, which precipitates, and acid nitrate, which remains in solution, as in the old process. The precipitated subnitrate would be contaminated with arsenic acid as arseniate of bismuth, were it not for the direction to let the solution stand twenty-four hours after diluting it to the point when a further dilution will throw down subnitrate. During this time the arseniate of bismuth falls and is separated by filtering. The addition of the ammonia decomposes the super salt and increases the amount of subnitrate of bismuth obtained. The washed subnitrate is now redissolved in nitric acid, affording a solution of bismuth free from the contaminating metal, which is diluted to the verge of precipitation, and then mixed with the solution of carbonate of soda to produce the subcarbonate of bismuth, which is washed, pressed and dried. In this last operation, it must be remembered, the bismuth solution is added to the carbonate of soda in excess, which further insures the absence of arsenic. Dr. Squibb and Mr. Maisch suggested the improvements in this process.

Bismuthi Subnitras.—In this formula a subcarbonate is formed with like precautions to avoid arsenic and any traces of arsenic acid which may have remained, become arseniate of soda, and is washed away with the washing water. The final treatment with ammonia is intended to increase the product as in the formula for the subcarbonate.

Cadmii Sulphas.—In this process advantage is taken of the superior solvent power of nitric acid in dissolving this metal, when, by means of carbonate of soda, it is obtained in a form easily washed, and very soluble in diluted sulphuric acid.

Calcis Phosphas Præcipitata, is one of the new preparations.

Ceratum Adipis.—The new name for simple cerate.

Ceratum Extracti Cantharidis.—This is the formula of Mr. Wm. R. Warner, (see Amer. Journ. Pharm. vol. xxxii. page 11). Though apparently weaker than the cerate of cantharides, it is, theoretically, about the same strength as the bulk and weight of the cerate is increased merely by the active portion of the extract, removed by the solvent action of the fatty matter.

Ceratum Sabinæ.—This preparation is now a cerate of the ethereal extract of cantharides, and it is stronger, as the whole activity of *three* troy ounces of savin are in the weight of 12½ troy ounces of the cerate, whilst, in the old preparation, only two ounces of the powder was contained in fourteen troy ounces of the cerate. It is a much more elegant, though more expensive, preparation.

Ceratum Saponis.—This cerate, when well made soap plaster is used, is a more eligible preparation than the old cerate, and very much less trouble to prepare. It differs in containing no acetate of potassa or free subacetate of lead, both of which are contained in the old preparation, if made literally by the recipe.

Cinchonia Sulphas.—This is a new officinal. The process is based upon that usually followed by the manufacturers who regain this salt from the mother-waters of the sulphate of quinia process. One motive for its introduction was to induce physicians to employ it as a substitute for quinia as a tonic. There is no doubt that in very many of the cases where quinia is ordered this salt would prove efficient, and physicians would do well, especially in the numerous instances where the necessities of their patients require economy in expenditure, to employ this agent, which costs only one-fourth the price of the quinia salt.

Collodium.—This formula is analogous but different from that of 1850, both in proportion of ingredients and in manipulation. Mialhe's plan of getting the nitric acid by sulphuric acid and nitrate of potassa is still adhered to, yet direction is given as to temperature and time of maceration; the latter increased from four minutes to twenty-four hours. The proportion of ether is *reduced* from forty fluidounces to twenty-one fluidounces, and the quantity of alcohol *increased* from one to six fluidounces; and the ether now used is the stronger. An improvement, originally suggested by the late Wm. W. Livermore, consists in washing the moist cotton with alcohol, to dehydrate it before solution in alcoholic ether. There is also an alternative process by which the collodion may be made from dried gun-cotton. The details of this formula were suggested by Dr. Squibb; the product is much more consistent than the old preparation, and is not filtered unless the cotton contains foreign fibres that contaminate the product, when a coarse cloth should be used.

Collodium cum Cantharide.—This is one of the new officinal preparations, though in use for several years. Originated in St. Petersburg by M. Hisch, its use has gradually spread until it is now recognized in our Pharmacopœia as a means of vesication. The menstruum differs from that in ordinary collodion, first, in containing none, or but little alcohol; and, secondly, in the modification produced by a large quantity of fatty oil extracted by the ether from the cantharides, and which modifies its contractile property. The presence of this oil is undoubtedly important as a menstruum to liquify and render more active the cantharidin present in the coating on the part to which it is applied. In operating on a large scale, some chemists have preferred to exhaust the cantharides with a sufficiency of ether, distill off the ether to semifluid extract and dissolve this in sufficient collodion to make the proper measure of the recipe.

With tight apparatus for percolation, and stronger ether, the directions of the Pharmacopœia are quite sufficient to produce an efficient preparation.

Confectio Sennæ.—This is the only formula of its class that has been changed. The new formula, in many respects, is an improvement on the old one. First, in the preliminary preparation of each pulp; and, secondly, in the omission of the liquorice root and boiling of the figs with it in the water, with the residue of the senna and coriander. Now, the pulpaceous ingredients are all treated together at one operation, using as much of each substance as will yield the quantity of pulp required. Then the sugar is added and the whole cooked until reduced to a definite quantity, which is intended to be that which on the addition of the senna and coriander will give the proper consistence without further evaporation. It will be found that an advantage will arise, as regards the keeping of the confection, if the senna and coriander powders are added whilst the syrupy pulp is quite hot, which renders the confection less likely to mould—the heat coagulating or cooking the albumen in these drugs. If correctly made the preparation should be smooth, aromatic and not unpleasant to the taste. It will be observed that the formula calls for the senna and coriander in fine powder. The finer these are obtained the smoother will the confection be, unless it be contaminated with particles of the capsules of the purging cassia, which sometimes occurs from the careless preparation of the pulps.

Decocta.—No additions or removals have been made in this class. The only changes relate to the manipulation, which results in obtaining always a given quantity of the decoction by percolating the dregs with water on the strainer. In some few instances, like Decoctum *Cetrariæ*, *Cinchonæ*, etc., it is preferable to percolate with boiling water, because of the precipitating influence of cold on these decoctions.

Emplastrum Antimonii.—Heretofore in making tartar emetic plasters it has been most usual to sprinkle the salt on the surface of the recently spread but yet warm plaster. In the new preparation one-fourth of the gross weight of the plaster is tartar emetic. Of the general mass of the salt contained in the plaster, but a small portion is active, owing to the particles being enclosed in the sheathing of resin and being insoluble in it, it is only the exterior layer that acts by contact.

Emplastrum Arnicæ.—Alcoholic extract of arnica incorporates easily and completely with resin plaster, and forms a compound adherent and efficient as a strengthening plaster. The plaster in this form was originally suggested by the author of this paper in this Journal for September, 1855, (vol. 3d, 514, 3d series), but the strength as there recommended was quite different, the extract obtained from twelve troy ounces of arnica flowers was incorporated with twenty-two troy ounces of resin plaster. Now, arnica flowers, with the menstruum there recommended, (alcohol 36° B. three parts, water one part,) yield 33 per cent. of soft extract, consequently, in the original recipe, the plaster consisted of four parts of extract to twenty-two parts of resin plaster. One part of the officinal plaster therefore represents one part of the flowers, and is a rather expensive preparation, taken in connection with the cost of the waste of alcohol, etc.

Emplastrum Opii.—This preparation differs from the old one in being made with the aqueous extract of opium,—a quantity equivalent to the opium of the old recipe. When an extract is made with water and alcohol so as to get all the soluble matter, the resulting plaster fully represents the drug and has its odor, whilst it is perfectly free from particles of opium not unusually observed in the plaster of the old recipe.

Emplastrum Picis Canadensis is a new officinal, being a mixture of one part of wax and twelve parts of Canada pitch, strained.

Emplastrum Picis cum Cantharide has been reduced in strength from the proportion of one part of cerate to seven of Burgundy pitch to that of one part to twelve of pitch. This change was made in view of the frequent excessive action of the old plaster, which had often to be reduced in strength.

The subjects of extracts and fluid extracts come next in order and will be remarked on in the next number.

(To be continued.)

ACTION OF IODINE, BROMINE AND CHLORINE UPON SUGAR.

Translated and communicated for this Journal by the author.*

I do not know of any work upon chemistry,† or of any chemist, having described the action of iodine upon sugar; yet the changes which take place between these two bodies deserve being studied by scientific men.

I have only to report a series of facts, the result of my experiments since 1856, in the preparation of the syrup of the iodide of iron, which led me to study the action of iodine, bromine, &c., upon sugar.

I have observed the two following facts:

1st. The partial spontaneous decomposition of the syrup of iodide of iron by exposure to the air, is arrested at a certain point, and does not go further, even if exposed for several months, in a capsule only covered with paper.

2d. This syrup, lightly decomposed, or even colored by the addition of a small quantity of iodine, becomes perfectly white after a long exposure to the sun's rays or to a moderate heat; replaced in the dark, it resumes its amber color.

However, two vials hermetically sealed, each containing the syrup of iodide of iron, one colored by natural decomposition, the other by the addition of a small quantity of iodine, were exposed for a year to the sun's rays, then both syrups were colorless; and they remained so for more than a year, though they were left in a dark cellar, and in half-filled bottles.

The first fact reverses the old theory of the decomposition of the syrup of iodide of iron, which was explained by the formation of a protoxide of iron and iodohydric acid, by means of the decomposition of the water into its two elements, and by the transformation of the protoxide of iron into sesquioxide of iron by the oxygen of the air. Evidently, should the decomposition of the water and of the iodide of iron operate thus, this process should continue to that point when all the iodide of iron is decomposed; this does not take place.

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* Répertoire de Pharmacie, Bouchardat, Decemb., 1859, et Union Pharmaceutique, par Dorvault, January, 1860, &c.

[† See Gmelin's Handbook, vol. xv. 252.—Ed. Am. Jour. Ph.]

To explain the second fact, I asked myself what became of the free iodine? for surely it could not combine itself with the proto-iodide of iron to form a sesqui-iodide; the sesqui-iodide of iron being red, should have remained so; we know, upon the other hand, that water dissolves hardly more than $\frac{1}{7000}$ of iodine, which, after some chemists, is transformed into iodic and hydriodic acids. The last question was, then, to know how free iodine acted upon sugar.

To elucidate this question, I made various experiments with iodine and simple syrup. I soon found that, with a moderate and prolonged heat, this metalloid added to the syrup was subject to a great chemical change.

One to ten grains of iodine, added to one ounce of simple syrup, in a strong bottle closed with a glass stopper, the whole exposed in a water bath at a moderate heat (60° Centigrade), are dissolved little by little, and give the liquid a reddish brown color; but after several hours, the whole being always kept at the same temperature, the syrup again becomes discolored. The flask must be cautiously shaken from time to time. The whole operation occupies about 48 hours.

In operating with a syrup containing ½ drachm of iodine to the ounce, I obtained, with some trouble, however, a similar colorless product.

The greater the proportion of iodine, the more attention is required; and towards the end of the operation, care must be taken to remove the syrup as soon as it turns white.

Arrived at this point, if the preparation is left exposed to heat, it soon colors again; by and by the sugar is transformed into caramel; and this burned sugar, quickly destroyed in its turn, gives rise to carbonic acid and to a blackish, light and spongy substance, partly soluble in water and alcohol. Treated by hydrochloric acid, potash, &c., this substance shows the same reactions as ulmin and ulmic acid. To carry on this operation to the entire decomposition of the sugar, all necessary care must be taken to prevent a fracture of the flask by the expansion of carbonic acid gas, which is formed in quantities, and can be collected.

The more the temperature is elevated, the larger is the proportion of iodine, and quicker is the sugar decomposed.

This white syrup of iodine, or iodinised syrup, has sometimes an aroma of fruit; it is acid, unalterable by air, heat at 100° Centigrade decomposes it; it contains much glycose. Treated with the reagents, it behaves like iodides in general.

These are the facts; the theory remains to be given.

Does the iodine, all or in part, combine with the sugar $C_{12}H_{11}O_{11}I$, or to the glycose $C_{12}H_{14}O_{14}I$, to form iodides similar to the iodide of starch, $C_{12}H_{10}O_{10}I$?

Or rather, in presence of sugar acting as a catalytic agent, should not iodine decompose the water into its elements, hydrogen and oxygen, and unite with them to form hydriodic and iodic acids? If so, these acids, once formed, would decompose the sugar precisely in the same way as the mineral and some other acids.

If not so, what are these acids, and how are they formed? Is it from the decomposition of the sugar or of the water?

Bromine acts upon sugar in the same manner as iodine, with the difference that the diverse phenomena follow more rapidly.

Chlorine acts upon simple syrup still more promptly than bromine; into water freshly saturated with chlorine, at a very cold temperature, I have thrown sugar, and heated the liquor as I have described for iodine. In less than half an hour the chlorine had disappeared, and the liquor was acid.

Chlorine was probably transformed into hydrochloric acid.

E. Fougera,
Pharmacien, New York.

ON ACONITIA AND ITS PHYSIOLOGICAL EFFECTS.

By M. Ernest Hottot.

In a former paper (see January number, p. 59,) the author, in connection with M. Liégeois, has published some results. In the present paper, which is extracted from a thesis sustained before the Academie de Medicine by M. Hottot alone, the author has entered more fully into the subject, both as regards its preparation and physiological effects. The following method of preparing aconitia was adopted:

Macerate the aconite root in powder in a sufficient quantity of alcohol of 85° during eight days. Displace the liquors, distill in a water bath, add a sufficient quantity of quicklime, agitate from time to time, filter, precipitate by a slight excess of diluted sulphuric acid, and evaporate to the consistence of syrup. Add to this liquid two or three times its weight of water, allow it to repose, and remove the green oil which floats and solidifies at 68° F., strain through a moistened filter to remove the last portions of oil; treat by ammonia in excess, and heat to ebullition; the aconitia is precipitated as a compact mass, which contains a great deal of resin, and separates easily from the liquor; wash the precipitate, treat it when dry by ether deprived of water and alcohol, and permit the ethereal liquor to evaporate spontaneously, which gives impure aconitia.

Dissolve the product thus obtained in diluted sulphuric acid, and precipitate it hot by ammonia; the aconitia separates in the form of a coagulum like codeia. Collect it on a filter, wash and dry it, dissolve in ether, evaporate to dryness, again dissolve in a small quantity of diluted sulphuric acid, and finally precipitate the aconitia by the addition, drop by drop, of an excess of ammonia; wash it, and dry at a low temperature.

Ten kilogrammes (22 lbs. av.) of the root of aconitum napellus in good order, gave a mean of 4 to 6 grammes (61 to 92 grains) of alkaloid.

Aconitia thus obtained presents the form of a white powder, extremely light, of a bitter taste: it is in the state of hydrate, and contains 20 per cent. of water; at 187° F. it melts and becomes anhydrous, and is then a transparent, amber-colored substance. Although the aconitia of M. Hottot has only been obtained in an amorphous state, it is very much more active than the aconitias of commerce, which are generally very impure, although they are often crystallized.*

A singular thing, and well worthy of attention, is, that there exists in aconite root two distinct substances, which possess, in different degrees, the physiological properties of this substance. One is the amorphous aconitia of M. Hottot, the other is a substance which is presented in the form of well-defined crystals,

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* See the paper of Messrs. Smith in this volume, page 173, on aconella (narcotina) in aconite.—Ed. Am. J. Pharm.

and which, after three successive crystallizations and evidently chemically pure, determined the same symptoms as amorphous aconitia, though in a much weaker degree. What is the nature of this substance which has been obtained by Mr. Morson, and for which he proposes the name of napellina? Is it a transformation of aconitia, or a co-existant body? Whatever it be, M. Hottot has studied aconitia, which presents the following properties:

Aconitia blues reddened litmus paper, saturates acids and forms salts which do not crystallize. It is a nitrogenous alkaloid, of which, the composition, according to M. Stahlschmidt, is represented by $C_{60}\ H_{17}\ O_{11}\ N$. Treated hot by SO_3, HO, it is colored first yellow, and afterwards violet red; tannin precipitates it abundantly; ioduretted iodide of potassium a kermes colored precipitate, and this reagent is its best antidote. Iodohydrargyrate of potassium gives a curdy yellowish-white precipitate; chloride of gold, yellow, and with chloride of platinum no precipitate.

M. Hottot employs aconitia in the form of pills, each containing the fifth of a milligramme ($\frac{1}{325}$th grain) or in the form of tincture one sixteenth of a grain to the drachm. The dose of the pills is from 2 to 10 per day, and of the tincture 10 to 40 drops.

The author has arrived at the following conclusions as to the physiological action of aconitia:

The root of aconite only should be used for making the preparations of aconite.

Aconitia has the same physiological properties as the root. The irritant properties of aconite, usually attributed to an acrid principle, belongs to aconitia. Its action is exercised on the mucous membranes.

The absorption of aconitia by the intestinal canal is more rapid than is that of curara and strychnia by the same tissue, and this explains the rapidity of the death of animals to which even small doses of aconitia have been given.

Aconitia acts on the nervous centres and successively on the bulb, the spinal marrow, and the brain.

The symptoms manifest themselves in the following order:

suspension of respiration, of general sensibility, of reflex sensibility, and of voluntary movements.

Aconitia disturbs the functions of the heart by acting on its nervous tissues.

The effects of aconitia on man are the following: Irritation of the mucous membranes, salivation, nausea, muscular weakness, prickling, sweats, heaviness of the head, pain in the track of the facial nerves, dilatations of the pupils, slow respiration, depression of the pulse and weakness of sensibility.

Aconitia is a powerful sedative: in external forms it has been applied with success in calming neuralgic and rheumatic pain; internally it may be given from $\frac{1}{130}$th to $\frac{1}{22}$d of a grain the maximum dose.

In conclusion M. Hottot cautions physicians and pharmaceutists in relation to the variable nature or power of commercial aconitia as made by different processes.—*Journal de Pharmacie, Avril,* 1864—30.

GLEANINGS FROM FOREIGN JOURNALS.

Dentifrice powder. Take of cream of tartar 100 grammes, Kaolin 100 grammes, Tannin 2 grammes, Sugar 50 grammes, Orris Powder 25 grammes, Essence of Mint 15 drops.

Trituate separately each of these substances, mix afterwards with care to form a homogeneous powder, and lastly aromatize with the essence of mint.

Effervescing Powders. C. Bedall proposes preparing a mixture of tartaric acid and bicarbonate of soda, in granular form, and permanent in the air; by mixing well dried tartaric acid and bicarbonate of soda, in the proportion of 5 to 6, with sufficient strong alcohol to reduce it to a moist condition, pass it then through a somewhat coarse sieve and thoroughly drying it. If desired it may be flavored by a little oil of lemon dissolved in the alcohol. A mixture thus prepared effervesces upon the addition of water, to the last crumb.—*N. Jahrb. Ph.* xx. 75.

Sweet Spirits Nitre. According to Fieldhaus the conversion of the nitrates of alkalies into nitrites is best effected by melting with metallic lead. Four ounces nitrate potassa with an equal weight of lead are melted together in an iron pan to a dull red heat, with constant stirring and the addition of about an ounce of lead. After the lead is mostly oxidized, it is heated to strong redness. The undecomposed nitrate is separated by crystallization, and the oxide of lead remains as a very fine powder. To prepare the nitrous ether, the solution of the nitrite is allowed to flow steadily into a mixture of alcohol and sulphuric acid; or, on the other hand, the acid mixture may be added gradually to the nitrite in pieces the size of a nut. The nitrous ether begins to form immediately, without the application of heat. From 500 grms. fused nitrite of potassa, and 500 grms. sulphuric acid, alcohol and water, 255 grms. nitrous ether may be obtained. Thus prepared it is somewhat acid, which may be neutralized in the usual way. The author considers this process an economical one for the production of sweet spirits of nitre, which contains from 1 to 5 per cent. of this ether.—*Ann. Ch. u Pharm.* cxxvi. 71, *N. Jahrb. Ph.* xx. 93.

Permanganate of Potassa is recommended as a rapid and excellent stain for wood. A solution of it spread upon pear or cherry wood, for a few minutes, leaves a permanent dark brown color, which, after careful washing, drying and oiling, assumes a reddish tint upon being polished.—*N. Jahrb, Ph.* xx. 169.

Persian Insect Powder. Prof. Koch, states the insecticide power of this article is due to a volatile oil, residing in the pollen of the flowers.—*N. Jahrb. Ph.* xx. 155.

Rendering bitter substances tasteless. The addition of a small quantity of chloroform to bitter draughts has been recommended as a means of facilitating their administration. The anæsthetic power of the chloroform, being exerted upon the organs of taste, deadens their perceptions. A drop of chloroform spread upon the tongue before tasting such medicines, is suggested as equally satisfactory.—*N. Jahrb. Ph.* xx. 157.

Preparation of Prussic Acid. Messrs. Bussy & Buignet have arrived at the following conclusions in regard to the preparation of this acid:—

1. In the process of Gea Pessina, the quantity of hydrocy-

anic acid obtained is more nearly the theoretical quantity than is the process of M. Gay Lussac.

2. The apparatus of Gea Pessina can be modified very easily to furnish the anhydrous acid.

3. Medicinal prussic acid, obtained with this anhydrous acid, is more stable than that which is obtained by the acid of Gay Lussac.

4. The stability of the acid of Gea Pessina has always a relative stability, the two acids being subject to the same phenomena of decomposition, and differ only in the time necessary to manifest these phenomena.

5. The acid of Gea Pessina does not owe its relative stability to the influence of the water, which is united with it, in the process of preparing it.

6. When the decomposition of hydrocyanic acid has commenced, under the influence of the light, it continues itself rapidly in the dark.

7. Hydrocyanic acid can be exposed to the light during a certain time without its appearance being modified, but in this case it has submitted to an influence which predisposes it to alteration and renders it more easily decomposable in the dark.

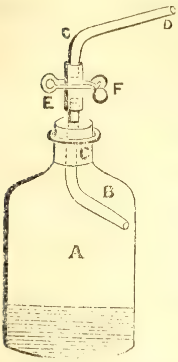
8. In measure as medicinal prussic acid is clouded and colored, its proportion of hydrocyanic acid is lessened gradually, and after a time, not very long, none of the acid, free or combined, can be found in it.—*Jour. de Chim. Méd.*, *Mars*, 1864.

ON THE VOLUMETRIC ESTIMATION OF TANNIC AND GALLIC ACIDS, IRON, MANGANESE, &c.

By Moritz Mittenzwey.

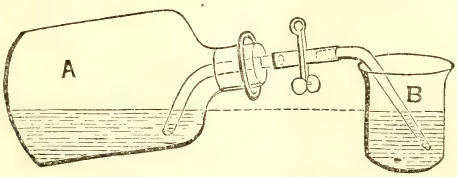
The known disposition of tannic acid in alkaline solution to absorb oxygen from the air affords an excellent means of estimating this body for technical purposes. The estimation can be conveniently made in the simple apparatus here figured and described.

The air in a bottle (A), capable of holding about a litre and



a half, communicates with the atmosphere by the bent tubes (B) and (C), the latter being drawn out at the end (D) to the diameter of about one or one and a-half millimetres. The two glass tubes are united by means of a moderately long piece of india rubber tubing (E), provided with a pinchcock (F) to close it; and the lower glass tube is fixed in the neck of the bottle by a bored cork, or, better, a caoutchouc stopper (G).

In executing the analysis it is absolutely necessary that the air in the bottle should be perfectly renewed, and the temperature of all reaching the fluid be the same as that of the laboratory. As soon as the absorbing lye (which should amount to 150 or 250 c.c.) is prepared, the bottle should be perfectly closed, and then the pinchcock opened just for a moment, so that the pressure of the internal and external air may be equalised. The absorption of the oxygen is then hastened by strongly shaking the bottle, which must be wrapped in a cloth to avoid raising the temperature by the warmth of the hand. After each shaking, water must be allowed to flow into the bottle (A) from a weighed quantity in a beaker (B. Fig. 2), so that the fluid in the two vessels may attain the same level, as shown in the drawing. The experiment is ended when, after repeated shakings, no more water runs from B to A, and the difference in the weight of the water in the beaker in *grammes* gives the amount of oxygen absorbed in cubic centimetres, which can be corrected for the standard temperature and pressure.



1. *For Gallic and Tannic Acid.*—Place in the bottle about 200 c.c of a 3 per cent. potash or soda solution, then drop in one gramme of tannic or gallic acid loosely wrapped in paper

and proceed as above described. The absorption is at first rapid, and in the case of gallic acid is soon complete; with tannic acid a longer time is required.

One gramme of tannic acid will absorb the same amount of oxygen as 0·7 gramme of gallic acid, namely, 175 c.c. at 20°C. In twelve experiments the greatest variation in the case of tannic acid amounted to only 2 c.c., and with gallic acid only 1·2 c.c. From six to ten experiments can be carried on simultaneously with ease, and indeed with advantage.

The best alkaline solution to use is a soda solution containing 2 or 3 per cent. of caustic soda, or a potash solution with from 3 to 5 per cent. of the caustic alkali. Experiments have proved strong solutions to be useless; for example, one gramme of tannic acid in a potash solution containing 35 per cent. of alkali only absorbed 22 c.c of oxygen. Further experiments confirmed this unexpected result.

It has been already remarked that gallic acid absorbs oxygen with much greater readiness than tannic. One gramme of tannic acid, after shaking for 60 seconds, only absorbed 23·4 c.c: while 0·7 gramme of gallic acid, after shaking for the same time, absorbed 71 c.c. of oxygen, the same proportion of each acid taking up when the absorption is complete one and the same volume (175 c.c.). We have here an indication of a means of estimating the two acids in the presence of each other. Suppose, for example, we have a substance, 2 grammes of which absorb 140 c.c., this will answer to $\frac{140}{175} = 0{\cdot}800$ grammes of tannic acid, or to $\frac{140}{175}.0{,}7 = 0{\cdot}560$ of gallic acid. For a second and decisive experiment, we now weigh as much of the substance as should combine with 175 c.c., in this case $2.\frac{175}{140} = 2{\cdot}500$ grammes, and shake this strongly with the lye, for 60 seconds. Suppose, after this, we have 20 c.c. absorbed, we have then a decisive proof of the presence of both acids, and we can draw a conclusion as to their respective proportions.

It must be observed that in these experiments an equal weight of the substance, equally strong alkaline solutions, and a flask of equal size, and of similar form (about 1·4 litre capacity), are indispensable conditions.

The following table, which gives the means of the numbers obtained in three experiments after shaking for sixty seconds, show sufficiently concordant results:—

1·000	grammes	Tannic acid	absorbed	23·4 c.c.
0·000	"	Gallic acid		
0·900	"	Tannic acid	"	27·5 c.c
0·070	"	Gallic acid		
0·570	"	Tannic acid	"	44·0 c.c
0·300	"	Gallic acid		
0·200	"	Tannic acid	"	61·0 c.c.
0·560	"	Gallic acid		
0·000	"	Tannic acid	"	71·0 c.c.
0·700	"	Gallic acid		

A rather roundabout but quite conclusive experiment may be made in the following way:—The mixture to be estimated is dissolved in a known quantity of water, and the tannic acid precipitated by gelatine; the gallic acid solution is then transferred to the absorption bottle to be estimated. A second experiment is then made with the mixture, and so all necessary data for the calculation are obtained.

In making use of the process to determine the tannic acid in leather, gall nuts, sumach, bark, &c., we proceed in the same way as with pure tannin. If the amount of tannic acid usually present in the substance is not already known it is advisable to make a preliminary experiment with a small quantity, and afterwards proceed with the quantity calculated to absorb 175 c.c. By a parallel experiment made with one gramme of tannin and shaking for 120 seconds, the amount of gallic acid will be discovered.

This method of analysis is only available for the ordinary commercial substances. Whether all the so-called tannic acids have the same capacity for the absorption of oxygen as ordinary tannic acid is as yet undetermined.

To Estimate Tannin in Leather.—From 4 to 7 grammes of the leather is cut into the thinnest possible slices, which are digested in about 200 c.c. of warm water; after cooling, from 7 to 10 grammes of stick potash wrapped in paper is dropped into the flask, and the shaking proceeded with.

With *sumach and oak bark* the same method is followed, or a hot-filtered decoction is used. The results with the decoction always differ from those with the substance itself, the latter being higher, which seems to show that a portion of the tannic acid withstands the solvent action of the water.

Gall nuts, *catechu* in powder may be estimated in the same way as pure tannic acid.

II. *Iron Compounds.*—These must be reduced to the state of protoxide by means of zinc, and the excess of acid neutralized with caustic potash or soda. (Ammonia and the carbonated alkalies must be avoided.) The solution is then poured into the absorption-flask and pieces of potash wrapped in paper are then dropped in. The absorption is complete in a very short time. For accuracy this process is second to none, and may be recommended in preference to that of Margueritte and Fuchs, since it requires fewer precautions. 50 c.c. of a solution of protoxide which contained 1·395 Fe absorbed in three experiments 148·0 c.c., 148·44 c.c, and 148·4 c.c. of oxygen at 19 C.; the mean = 148·28 c.c., which at this temperature weigh 0·1987 grammes, answering to 1·391 grammes of iron.

III. *Manganese Compounds.*—As these are easily reduced to the state of protoxide, the estimation is made in the same way as in the case of protoxide of iron, but it is necessary to know to what extent the protoxide of manganese unites with iron. Further experiments are required to determine this point, and the following proportional numbers are only the results of some few experiments that have led to the conclusion that one part by weight of absorbed oxygen corresponds to 4·34 parts by weight of manganese, which may be calculated as the oxide $Mn_5 O_9$. In the absence of more complete researches it is superfluous to discuss the rational formula of the resulting oxide; but one thing is certain—namely, that the oxidation does not proceed so far as the state of binoxide.

The estimation of manganese in the presence of iron is performed in two operations—one with the iron in the state of protoxide, and the absorption observed in the two cases. The combination of the two results will give the desired explanation.

Active oxygen may be estimated in a similar way, by means of a solution of protoxide of iron.

Indigo may be valued in the following way;—In a well-closed glass bottle, finely powdered indigo is reduced by means of potash or lime and a protosalt of iron, under a layer of mineral oil. When the precipitate has completely deposited, a certain volume of the clear solution of indigo-white is removed by means of a pipette, care being taken that a layer of oil swims on the surface of the solution. The pipette is then emptied into the absorption bottle, which must also contain oil, and the shaking is continued until the indigo blue is re-formed. According to theory, 8 parts by weight of combined oxygen answer to 131 parts of indigo blue; or, for one gramme of indigo blue 45·7 c.c. of oxygen at 20°C. are required. From these numbers we may see at once what degree of accuracy this way of analysing indigo promises.—*Journ. fur Prakt. Chem.*, from *Chem. News*, *London*, *May*, 1864.

WHY BEES WORK IN THE DARK.

A lifetime might be spent in investigating the mysteries hidden in a bee-hive, and still half of the secrets would be undiscovered. The formation of the cell has long been a celebrated problem for the mathematician, whilst the changes which the honey undergoes offer at least an equal interest to the chemist. Every one knows what honey fresh from the comb is like. It is a clear yellow syrup, without a trace of solid sugar in it. Upon straining, however, it gradually assumes a crystalline appearance—it *candies*, as the saying is—and ultimately becomes a solid mass of sugar. It has not been suspected that this change was a photographic action. That the same agent which alters the molecular arrangement of the iodide of silver on the excited collodion plate, and determines the formations of camphor and iodine crystals in a bottle, causes the syrupy honey to assume a crystalline form. This, however, is the case. M. Scheibler has enclosed honey in stoppered flasks, some of which he has kept in perfect darkness, whilst others have been exposed to the light. The invariable result has been that the sunned portion rapidly crystallises, whilst that kept in the dark has remained perfectly liquid. We now see why bees are so careful to work in perfect darkness, and why they are so careful to obscure the glass windows which are sometimes placed in their hives. The existence of their young depends on the liquidity of the saccharine food presented to them, and if light were allowed access to this the syrup would gradually acquire a more or less solid consistency; it would seal up the cells, and in all probability prove fatal to the inmates of the hives.—*Chem. News, London, April* 30, 1864, from *Chronicle of Optics*, "*Quarterly Journal of Science.*"

ON THE REMOVAL OF STAINS FROM SILK.

To the Editor of the Pharmaceutical Journal:

Sir,—I send you the following particulars, thinking they may be interesting, if not useful, to some of your readers who may yet be uninformed on the subject:—

Being anxious to discover some means by which the color could be restored that had been extracted from a violet silk dress by acid-juice having been accidentally thrown upon it, I applied to more than one chemist and druggist, thinking there must be some chemical agent which would restore violet, as spirit of hartshorne, it is well known, will restore black.

Not being able to obtain any information on the subject, I thought of trying some experiments for myself; the first proving successful may be worth recording, if only to amuse the more learned with an account of the simple attempts of an amateur.

Having recently superintended the "iodine procsss" for annihilating a blot of marking-ink from linen, it occurred to me to try it upon the violet silk; the plan I adopted is as follows, and will serve as a recipe:—*Brush the portion of fabric with tincture of iodine, then, after a few seconds, well saturate the spot with a solution of hyposulphite of soda, and dry gradually;* the color is perfectly restored, and I consider my experiment highly satisfactory. M. A. B.

March, 1864.

P. S.—I should have stated that it was knowing something of the chemical composition and properties of iodine induced me to make the experiment which I have described.—*London Pharm. Jour., April,* 1864.

ON CINCHONA CULTURE IN INDIA.

By Dr. De Vry.

Dr. De Vry communicated a paper "*On the Cinchona Cultivation in British India*," which was read by Mr. Hanbury. After a six years' residence in Java, the author has obtained leave of absence for two years to recruit his health; and on his way home he made a visit to the British cinchona plantations in Ceylon and on the Neilgherry Hills in the Madras Presidency. Two systems of cultivation appear to be followed in the British possessions, one in dense forest shade, and the other in the open sunshine. In the Dutch settlement at Java the plants are grown in dense shade, and the author was anxious to investigate for himself the results of the cultivation in sunshine. In Ceylon he found the Cinchona succirubra grown at an elevation of 1600 feet in the shade. The plants were healthy, and from 8 to 9 feet high. They were found to grow better in loftier situations, and the leaves in plants grown in high situations contained twice as much quinovic acid as those grown in lower. An immense number of the Cinchona succirubra plants are growing in Ceylon, some in sunshine and some in shade; and a plant thirty-one months old has attained a height of 10 feet and the circumference of 7 inches. At one station there were fifty-seven healthy plants of Cinchona Calisaya. The loss of plants by death, Dr. De Vry was surprised to learn, was only $\frac{1}{10}$th per cent. in Ceylon; in Java the average loss was 10 per cent. From Ceylon the author went to India, and visited Otacamund, where he found the plants under Mr. McIvor's charge in an excellent state. In three years the number has increased from 1000 to 243,166; and a most extraordinary instance of multiplication was seen in the case of the single specimen of C. uritasinga, received eighteen months before from Mr. Howard, from which plant alone 4730 others had been obtained by cuttings and buds. It was noticed that plants from large cuttings were in a less satisfactory state than those from small. The plants were all healthy, and in this part were grown in open sunshine, which Mr. McIvor considers most favorable to their growth. Wherever he could, Dr. De Vry obtained specimens of leaves and the bark of both root and stem, and these he has submitted to analysis. His results are contained in an elaborate table, which was not read to the meeting. The author estimated the quinine, cinchonine, quinidine, and cinchonidine, and noticed another alkaloid, soluble in ether, which does not give the reactions of quinine, and which somewhat complicated the results. He also determined the quinovic acid in the leaves, which he considers an essential constituent of the cinchonas. Besides this acid, the leaves yielded traces of alkaloids, but not quinine. An experiment had been made to test the effects of thickening the bark by wrapping moss around the stem, and it had proved successful. The bark of a young plant so treated yielded 8·4 per cent. of alkaloids. One unexpected result obtained in Dr. De Vry's experiments was that the root bark was found to contain more of the alkaloids than the bark of the stem. In conclusion, the author expressed his belief that the cultivation of cinchona in India had proved a complete success, and that future results would show it as lucrative as it is now interesting in a scientific point of view.

Mr. Morson called attention to the circumstance of quinovic acid appearing in the plant before the quinine. In the poppy it had been noticed that meconic acid apppeared long before morphia.

Mr. D. Hanbury, Jr., thanked Mr. De Vry for his interesting communication, and remarked on the extraordinary increase in the number of plants, a single plant being increased to 4000 without seed.

Dr. De Vry said that Mr. McIvor preferred to propagate by cuttings, and not by seeds. He also starved the plants to compel them to make root, which would appear to be the most valuable part of the plant, for he had himself found eight times more alkali in the bark of the root than he had found in the bark of the stem. It might perhaps prove more useful to cultivate the plant for the root than the bark. Experiments were now in progress in Java to determine that point. He believed that the bark of the root of South American cinchona had been used in France.

Mr. Hanbury said that the root bark of the C. Calisaya had been imported into England, but although it was very cheap it would not sell.

Mr. Morson inquired whether quinovic acid possessed any medicinal properties?

Dr. De Vry replied that he believed it had; he had made experiments on the subject, and intended shortly to publish his results.

Professor Bentley said that Dr. De Vry's account of our cinchona plantations was very assuring. One fact mentioned, however, was at variance with a statement of Mr. Howard, who had asserted that the root bark of C. Calisaya only contained one-tenth of the alkaloids found in the bark of the stem. There was, of course, no question about the accuracy of Dr. De Vry's results, and it might be that the difference was owing to different ages of the plants.

Dr. De Vry said that the whole of his results had been confirmed by Delondre, with whom he had worked.—*Trans. Pharm. Soc. in Chem. News, London, May* 14, 1864.

HOW THE CHINESE MAKE DWARF TREES.

We have all known from childhood how the Chinese cramp their women's feet, and so manage to make them "keepers at home;" but how they contrive to grow miniature pines and oaks in flower-pots for half a century, has always been much of a secret. It is the product chiefly of skilful, long-continued root-pruning. They aim first and last at the seat of vigorous growth, endeavoring to weaken it as far as may consist with the preservation of life. They begin at the beginning. Taking a young plant (say a seedling or cutting of a cedar), when only two or three inches high, they cut off its taproot as soon as it has other rootlets enough to live upon, and replant it in a shallow earthern pot or pan. The end of the taproot is generally made to rest on the bottom of the pan, or on a flat stone within it. Alluvial clay is then put into the pot, much of it in bits the size of beans, and just enough in kind and quantity to furnish a scanty nourishment to the plant. Water enough is given to keep it in growth, but not enough to excite a vigorous habit. So, likewise, in the application of light and heat. As the Chinese pride themselves on the shape of their miniature trees, they use strings, wires, and pegs, and various other mechanical contrivances, to promote symmetry of habit, or to fashion their pets into odd fancy figures. Thus, by the use of very shallow pots, the growth of the taproots is out of the question ; by the use of poor soil and little of it, and little water, strong growth is prevented. Then, too, the top and side roots being within easy reach of the gardener, are shortened by his pruning-knife or seared with his hot iron. So the little tree, finding itself headed on every side, gives up the idea of strong growth, asking only for life, and just growth enough to live and look well. Accordingly, each new set of leaves becomes more and more stunted, the buds and rootlets are diminished in proportion, and at length a balance is established between every part of the tree, making it a dwarf in all respects. In some kinds of trees this end is reached in three or four years ; in others ten or fifteen years are necessary. Such is fancy horticulture among the Celestials.—*Lond. Pharm. Journ.*, *May*, 1864, from *The Technologist.*

DECOMPOSITION OF WATER BY PHOSPHORUS, ARSENIC, AND ANTIMONY, UNDER THE INFLUENCE OF NITRIC ACID, WITH PRODUCTION OF AMMONIA.

By M. Personne.

The solution of phosphorus in nitric acid, concentrated or diluted with one or two volumes of water, is, as is well known, effected with disengagement of nitrous vapor, abundant if the acid is concentrated, and diminishing in proportion as it is more diluted. In any case if, when the solution is effected, excess of potash is added to the hot solution, sufficient ammonia is disengaged to become evident, both by reagents and by its odor. Whether normal or amorphous phosphorus is used in this operation, the phenomena and the products are identical.

It was interesting to ascertain whether the fact of the production of ammonia was observable with the bodies forming part of the phosphorus group, as arsenic and antimony.

I operated with distilled arsenic and with antimony purified three times by fusion with nitre.

These two bodies pulverized and heated were attacked by nitric acid, diluted with its volume of water. Under these circumstances arsenic is easily attacked, giving arsenious acid and a little arsenic acid; antimony, on the contrary, is attacked with more difficulty. However that may be, if ammonia is looked for in the liquids obtained it will be found that these two bodies have behaved like phosphorus, with this difference, that phosphorus gives more ammonia than does arsenic, and arsenic more than antimony.

The phenomenon of the formation of ammonia by the decomposition of water under the influence of nitric acid has hitherto been observed only with metals of the third and fourth section, as iron, zinc, tin, &c.

The above observations show that this phenomenon is not limited to these metals, but belongs equally to the metalloids of the phosphorus group.—*Lond. Chem. News*, *May* 21, 1864, from *Bulletin de la Société Chimique*, vi. 163.

DULOS' PROCESSES OF ENGRAVING.

A copper plate, on which the design has been traced with lithographic ink, receives, by the action of the pile, a deposit of iron on the parts untouched by the ink; the ink having been removed by means of benzine, the white portions of the design are represented by the layer of iron, and the black by the copper itself; the plate is then plunged into a bath of cyanide of silver, under a galvanic current, and the silver is deposited on the copper only. In this condition mercury is poured over the plate, which attaches itself to the silvered portions only, appearing in relief, and taking the place of the lithographic ink. Then take, in plaster or melted wax, an imprint, the cast of which presenting the counterpart of the projections of mercury, gives a kind of copper plate engraving. This cast has not sufficient strength to bear the press; but by metallising the mould, and depositing upon it, electro-chemically, a layer of copper, we obtain an exact reproduction of the original projections of mercury, and in some sort a matrix by means of which impressions of the plate may be produced *ad infinitum.*

For typographic engraving (figures in relief), the plate of copper should receive, on leaving the hands of the designer, a layer of silver, deposited only on the parts untouched by the lithographic ink; the ink is removed by benzine, the surfaces first covered by the design are oxidised, and the treatment above described is continued. At the end of the operation the raised portions of the electro-chemical plate intended for the impression will be found to correspond with the tracing of the design, and the hollow portions with the thickenings raised about the design by the mercury.

This process, which is the starting-point and the basis of M. Dulos' invention, has led him to the discovery of some more simple methods, which have led to important practical results, the fusible metal or amalgam of copper substituted for mercury giving rapid and remarkably perfect results.—*London Chem. News, May* 21, 1864, from *Moniteur Scientifique*, vi. 215.

PERMEABILITY OF IRON BY HYDROGEN.

Our readers may recollect our having, some months ago, mentioned certain experiments made by MM. H. Sainte-Claire Deville and Troost, from which it appeared that, by a kind of endosmosis scarcely to be suspected in the case of a metal, hydrogen would pass through the pores of a platinum tube. Last week, the Academy of Sciences received from them a new paper, in which they announce a similar property in iron. The great difficulty was to find a tube answering to the various conditions required for the experiment. The best iron to be found in the markets might still be open to some objection, since in point of fact it is a mere sponge flattened by a hammer, like common plantinum. They succeeded at length, through the kindness of a friend, in obtaining a tube of cast steel, containing so little carbon that it did not admit of being tempered. It was in reality rather iron than steel, and so soft that it was drawn into a tube without heating or soldering, though its sides were of a thickness of from three to four millimetres. To the ends of this tube, two other tubes of a much smaller diameter and of copper, were soldered with silver; the whole was then introduced into an open porcelain tube, which was put into a furnace; a glass tube, luted to one end, established a communication with an apparatus generating hydrogen completely deprived of atmospheric air; while at the other end, another glass tube, bent at right angles, dipped into a mercury bath, its vertical branch being 80 centimetres long. For the space of eight or ten hours, a current of hydrogen was driven through the apparatus, which was maintained at a high temperature, so as to exhaust the action of the hydrogen on the sides of the iron tube, and to drive away all the atmospheric air, as well as the moisture contained in the tube, or likely to be produced there. This done, the communication between the iron tube and the hydrogen apparatus was cut off by melting down the glass tube by the aid of the blowpipe. No sooner was this effected, than the mercury, no longer kept down by the stream of hydrogen, yielded to the pressure of the air, and rose in the vertical glass tube to the height of 740 millimetres, or very nearly the usual barometrical height. This would not have happened, had there not been a nearly complete vacuum in the tube the instant the supply of hydrogen was cut off. But what had become of the hydrogen supplied before? There is but one explanation possible, viz: that, notwithstanding the pressure of the atmosphere, the hydrogen had passed through the pores of the steel tube. Hence an iron tube introduced into a furnace where there are reducing gases, is a most powerful instrument for carrying off all the hydrogen.—*Amer. Journ. Sci. and Arts, May,* 1864, *from Galignani.*

BOTANICAL GARDENS OF THE BRITISH COLONIES.

One of the principal supports for the cultivation of the Natural Sciences, and which insure her superiority, England derives from the numerous botanical gardens, which have been established, some of them for a considerable time, and all of them under the supervision of competent men, at various stations in her principal colonies. Among these:

In *Canada*, the *Kingston Botanical Garden,* Dr. Lawson, Director.

In *Jamaica*, the *Bath Botanical Garden*, N. Wilson, Superintendent.

In *Trinidad*, *St. Anne's Botanical Garden*, Dr. H. Kreuger, Director.

In *East India*, at *Calcutta*, the *Royal Botanical Garden*. Dr. Thomas Thomson, F.R.S., F.L.S., Superintendent; Dr. Thomas Anderson, F.L.S., acting Superintendent.

The *Agricultural Society's Nursery Gardens*, A. H. Bleckynden, Esq., Secretary.

At *Bombay*, the *Botanical Garden*, *Heura*, N. A. Datzell, Esq., Superintendent.

At *Madras*, the *Horticultural Garden*, Mr. A. F. Jeffray, Superintendent.

At *Bangalore*, *Public Garden*, under Mr. W. New, Superintendent.

At *Octacamund*, *Nilgherry Hills* (Cinchona plantation), under W. G. McIvor.

At *Saharumpore*, the *Botanical Garden*, W. Jameson, Bengal army, Superintendent.

At *Menghyr*, *Public Garden*, T. E. Ravenshaw, B.C.S., Secretary.

At *Etawah*, *Horticultural Garden*, A. O. Hume, Esq., B.C.S., Secretary.

At *Balasore*, *Agricultural Society's Gardens*, Dr. A. A. Mantell, Secretary.

On *Ceylon*, *Royal Botanical Gardens*, Paradenia, near Kandy, G. H. K. Thwaites, Esq., F.L.S., Director.

In Australia:

At *Victoria*, *Melbourne Botanical Garden*, Dr. F. Mueller, F.R.S., F.L.S., Director.

At *Victoria*, *Gippsland Botanical Gardens*, Mr. Sale.

At *Sidney*, *Botanical Gardens*, Chas. Moore, Esq., F.L.S., Director; Mr. James Kidd, Superintendent.

At *Queensland*, *Brisbane Botanical Gardens*, Mr. Walter Hill, Colonial Botanist and Director of Botanical Gardens and the Queen's Domains.

South Australia, *Adelaide Botanical Gardens*, Mr. G. W. Francis, Superintendent.

Tasmania, *Royal Society's Gardens*, *Hobarton*, Mr. F. Abott, Jr., Superintendent.

In *Africa—Mauritius*: *Royal Botanical Garden*, Mr. James Duncan, Superintendent.

Cape of Good Hope, Botanical Garden, Cape Town, Mr. Brown.

Natal, Botanical Garden, Mr. Mark J. McKen, Esq.; D'Urban, Curator.—*Drug. Circ., May,* 1864.

SAVORY AND MOORE'S ATROPIZED AND CALABARIZED GELATIN.

In the *Chemist and Druggist* of July 15, 1863, is an account by Mr. Tegetmeier of the singular properties of the ordeal bean of Calabar, the *Physostigma venenosum.* The article describes the singular effect of this poisonous bean in causing contraction of the pupil, when a solution is dropped into the eye, its action being precisely the reverse of that of the *Atropa Belladonna.*

It is obvious that so potent and peculiar an agent was not likely to remain long unutilized, and as soon as a supply of this scarce seed could be obtained it was applied to practical purposes. The mode of using it, by dropping a solution into the eye, being found inconvenient, Mr. Stretfield proposed saturating small pieces of paper with the solution, and placing them beneath the eyelid. This plan is also inconvenient, as it necessitates the removal of the paper subsequently. Messrs. Savory and Moore have recently, at the suggestion of Mr. Ernest Hart, introduced a new and very convenient mode of employing the remedy.

The solution of the Calabar bean is mixed with gelatin, and then evaporated, so as to leave an exceedingly thin film. This film is cut up into minute circular discs, about the size of this letter O.

One of these is easily placed in the eye, by directing the patient to gaze upwards, and while the eye is in this position drawing down the under lid and applying the gelatin to the lower part of the ball. The eye is then closed, the gelatin speedily softens, and the remedial agent is slowly dissolved and absorbed. As before stated, the action of the Calabar bean is to cause contraction of the iris, so as to give rise, temporarily, to the condition of imperforate iris. The advantage to the oculist of being able to produce this condition at will, need not be insisted on.

Messrs. Savory and Moore have also prepared gelatin discs with belladonna for dilating the pupil. These are made of several degrees of strength, containing respectively $\frac{1}{20,000}$th, $\frac{1}{50,000}$th, and $\frac{1}{100,000}$th of a grain of atropine. The certainty of action of these discs and the greater convenience in use over the ordinary mode of employing belladonna is evident. Both remedies are packed in very small glass tubes, each containing 150 discs.

So successful has this mode of employing remedial agents been found in practice, that Messrs. Savory and Moore are now preparing morphine, ergotine, iodide of potassium, bromide of potassium and bromide of ammonium in the same manner. —*Chemist and Druggist*, May, 1864.

ON CONIA.

By Dr. James Young.

Dr. James Young read the following remarks on "Cicutine:"

The question, What is Cicutine? may reasonably be asked by some here, as it has only recently been introduced as a medicinal agent, and has no place assigned to it in the British Pharmacopœia.

The object of the following remarks is to throw some light on the subject.

It will suit my purpose better to mention first the physiological action of the drug, before I make a few remarks on its histology. Case I.—In the month of November last, while I was in attendance on a lady from Fife, I had occasion to have a consultation with Professor Simpson relative to her complaint. When Dr. Simpson had carefully examined the patient—his diagnosis being neuralgia of the pelvic cellular tissue—he recommended me to put her immediately under Cicutine. I spoke to my friend Mr. Mackay regarding this new drug. He failed to obtain any of the granules in town, but speedily received some from London, or Paris, where the granules are prepared by M. Pelletier. I ordered this patient to take three of the granules per day, until she had taken some two dozen or more, with the most marked results; nay, let me tell you, her own remark was, "What a wonderful medicine!" This lady was requested to continue the same medicine after she went home if the neuralgic pain returned. Let me only add, that the pain of which she was relieved was constant and severe. Case II.—The next patient for whom I prescribed this medicine was the late Mr. H. He suffered for a long time from neuralgia of the extensor muscles of the lower part of the leg. In November, 1863, I put him under Cicutine granules, which he continued for a week, by which time he was completely relieved of pain, and continued so for four days; but on the fifth day the pain returned, and ultimately only yielded to the subcutaneous injection of morphia, and even that was but temporary, as the disease increased till he died.

When Dr. Christison saw Mr. H. with me, I told him of the great relief afforded to my patient by the use of Cicutine, which led to a conversation regarding this new remedial agent. Dr. Christison supposed, at first, that Cicutine was the alkaloid of *Cicuta virosa*, or Water Hemlock, which is not used in medicine, as it is considered a narcotico-acrid poison, causing true tetanic convulsions.

I told him that I understood Cicutine to be the same as Conëin. We accordingly met the next day and subjected one of the granules to a careful analysis, when Dr. C. and I distinctly traced in it the peculiar mousy odor of Conium. This Cicutine, then, is Conia, or Conicin, the peculiar alkaloid or active principle of hemlock. Each granule contains $\frac{1}{60}$ of a grain of the alkaloid.

In Neligan's "Materia Medica," I find a recommendation of Conëin in neuralgic affections, as he has known it alleviate pain in doses of $\frac{1}{50}$ of a grain.

At page 233 of Dunglison's Medical Dictionary, I find Cicutine, or Conicine, mentioned as the active principle of *Conium maculatum*, and that either it or its salts have been given as sedatives to the nervous centres in neuralgic diseases.

Mention is also made of Cicutine by Mr. Justus Liebig under Volatile Bases, where he says that Conicine, or Cicutine, or Conin, was discovered by Gieseke, but first obtained pure by Geiger; that it occurs in *Conium maculatum*, having a formula of C_{16}, H_{15}, N, and symbol of Co×. It is easily miscible with alcohol or ether.

I have said that no place has been assigned to Cicutine in the British Pharmacopœia; I find, nevertheless, that Dr. Garrod, of King's College, in his last lecture on the British Pharmacopœia, has some remarks on *Conium maculatum*, where he says that it owes its activity to its alkaloid Conia. He speaks of the tincture, Succus, but we fail to find any remark on the medicinal effect of the pure alkaloid alone.

I have prescribed Cicutine for many other patients besides the two mentioned, but I must refrain from any notice of them, as to the effects of the drug, as there has not been sufficient time, and one of the patients I refer to has gone to Dumfries; but I considered myself justified, from what we have already seen of this new remedy, in bringing it under the notice of the Pharmaceutical Society.—*Pharm. Journ.*, Lond., March, 1864.

AN OIL LAKE IN TRINIDAD.

There is in Trinidad, only a mile from the coast, a basin of ninety-nine acres, filled with asphalt, yielding seventy gallons of crude oil per ton. There are also springs of asphaltic oil in the neighborhood, and large pitch banks off the shore. It is estimated that the lake is capable of producing three hundred million gallons of oil, and forty or fifty gallons are considered equal to a ton of coal. The *Trinidad Colonist* publishes a *memoire* by Mr. Stollmeyer, of Port of Spain, proposing the use of this liquid fuel for oceanic steam navigation: and he states that he has been, at various times, for these three years, suggesting this employment of a distillate from the pitch lake of Trinidad. To oil a ship would not take above a tenth of the time it takes to coal her, if pipes were employed, and the oil would not take above a fourth of the space occupied by coals. He recommends that it be applied at once as auxiliary to coal, by throwing jets over the burning mass, but contemplates, eventually, upright tubular boilers, the liquid fuel to be supplied as fast as it can be converted into flame. Of course, the North-American oil springs are another source of supply.—*Am. Drug. Circular*, *June*, 1864, from the *London Times*.

THE CENSUS RETURNS RELATING TO MEDICINE AND PHARMACY IN ENGLAND.

The present population of England and Wales in round numbers is twenty millions, and to minister to the medical wants of this population it appears that there are 38,441 persons engaged, or preparing to engage, in different departments of the practice of medicine. Thus the Registrar General in his report states:

"The medical order comprises 38,441 persons, of whom 35,995 are men and 2,446 are women; 14,415 physicians, surgeons, and apothecaries, are at the head of the list; 3,566 medical assistants and students, 1,567 dentists, and 16,026 chemists and druggists, including apprentices and assistants (3,388 of the age 10–20), follow. Then there are of men cuppers 10, officers of medical societies and agents 21, corn-cutters 56, professors of hydropathy and homœopathy 27, herb doctors and patent medicine venders 92, 82 medical botanists, 50 galvanists, 12 mesmerists, 21 bone-setters, 22 quack doctors, so returned, and 2 cancer doctors, besides others. The women consist chiefly of druggists, 388, and midwives, 1,913."

It thus appears that in England and Wales, with a population of twenty millions, there are sixteen thousand chemists and druggists of all sorts, including apprentices and assistants. The returns do not indicate what proportion of these are engaged in business on their own account, but they classify them according to their ages, and we thus find that of the 16,000 there are only 12,638 of the ages of 20 years and upwards. There are, therefore, 3,388 who are under twenty years of age, and who no doubt constitute the class of apprentices. Of the 12,638 persons of 20 years of age and upwards who are engaged in the practice of pharmacy, a large proportion occupy the position of assistants. Although the census returns afford us no means of showing exactly how many are principals and how many assistants, yet we may form a pretty good estimate of this by referring to the statistics of such a place as London. Mr. Coke, one of the compilers of the "statistical charts of the population," in his very useful and compendious tables, has calculated the average number of the population in London to every chemist and druggist, and this shows that there is one chemist and druggist to 3,505 of the population. If the same proportions exist throughout the country, we should thus get 5,700 as the number of chemists and druggists for England and Wales. We may put them at 6,000, and then we should have equal numbers of principals and assistants or apprentices, of 20 years of age and upwards.

Referring back to the census returns of 1851, we find that the total number of chemists and druggists, including apprentices and assistants, was then 14,039, of whom 3,193 were under 20 years of age, leaving 10,846 of and above that age. The increase in the number of chemists in the 10 years from 1851 to 1861, taking those of 20 years of age and upwards, has been at the rate of 17 per cent., while the increase in the population has been at the rate of only 12 per cent. This is worthy of remark, especially as it appears that little or no increase has taken place in the class of medical practitioners. According to the returns, physicians, surgeons, and other medical men, including students and assistants, were 19,190 in 1851, and they were only 19,548 in 1861.—*American Druggist's Circular, June*, 1864.

PREPARATION OF PHYSOSTIGMIN.

By Jobst & Hesse.

J. Jobst and O. Hesse, in a paper on "The Calabar Bean," in the *Annalen der Chémie und Pharm.*, describe the preparation of this powerfully poisonous principle, (which they have found only in the cotyledons of the bean,) from the strong alcoholic extract, as follows:

"The extract is dissolved in a little cold water, and calcined magnesia is added until its acid reaction disappears, and a brown color is produced. The liquid is then evaporated by gentle warmth, nearly to dryness, when the residue, still moist, is placed upon white filtering paper, and agitated in a suitable vessel with ether, until the brown color of the paper entirely vanishes, and the ethereal liquid ceases to yield the alkaloid with acids. The collected ethereal solutions are then filtered and agitated with a few drops of very dilute sulphuric acid, whereupon they separate into two liquids, the upper one of which contains a colorless, inactive, ethereal oil, while the other, of a dark red color, is an aqueous solution of the sulphate of physostigmin. The latter, carefully separated by a pipette from the ether, is precipitated with magnesia, and the alkaloid extracted by the smallest possible quantity of ether: finally the ethereal solution is evaporated to dryness.

Physostigmin is thus obtained as a brownish-yellow amorphous mass, appearing in the first place in oily drops. It is rather easily soluble in ammonia, solution of soda, ether, benzine and alcohol; less soluble in cold water. It is completely removed from its ethereal solution by animal charcoal. The aqueous solution possesses a slightly burning taste, is decidedly alkaline, and gives with the iodo-hydrargyrate of potassium a rich kermes-colored precipitate, and with chloride of iron a precipitate of hydrated oxide of iron. Heated with caustic potassa it yields strongly alkaline vapors. Acids dissolve it very readily, and afford solutions which are mostly of a dark red, seldom of a dark blue color, which become colored more or less by sulphuretted hydrogen.

The muriate, sulphate, and acetate of physostigmin have been obtained so far only as red amorphous masses, which are readily soluble in water and alcohol.

The salts of physostigmin gave with tannic acid a considerable amount of a reddish white, amorphous, flocculent precipitate, soluble with difficulty in hydrochloric acid; with chloride of platina, a light yellow amorphous precipitate, slightly soluble in hydrochloric acid and boiling water; with chloride of gold, a blue precipitate in large amount: after a short time the gold separated, while the solution became of a purple red color. Sulphuretted hydrogen decolorized the solution. With bichloride mercury, a reddish white amorphous precipitate, slightly soluble in hydrochloric acid.

The extremely small amount of alkaloid obtained from 21 beans precluded any analysis of it.

By experiments upon rabbits, we have ascertained that physostigmin is the active principle of the bean. Two drops of the aqueous solution of the alkaloid, placed in the eye, caused the pupil to contract in about ten minutes to $\frac{1}{20}$th its natural size, and it remained in this condition nearly an hour. After five or six hours it regained its usual dimensions. Taken inwardly, physostigmin approaches in activity the most poisonous of the cyanogen compounds. To a strong, lively rabbit was administered a freshly prepared solution of the chloride of the alkaloid, which had been previously neutralized with ammonia. The amount of the alkaloid used corresponded nearly to that contained in one bean. Five minutes after swallowing the poison the rabbit fell down, remained *almost motionless*, and died in about twenty-five minutes.

We should not omit to mention that physostigmin acts upon the eye even of the dead body, if too long a time has not elapsed after death. We tried some experiments one hour after the death of an animal. We placed two drops of the aqueous solution of physostigmin into the eye of a rabbit which had been killed without the use of this poison, in consequence of which the pupil contracted to ¼ its size (compared with the other eye), and remained in this condition. On the other hand, we found that in the eye of an animal killed by physostigmin no contraction took place, while in another, poisoned by cyanide of potassium, a small contraction was apparent, but which soon disappeared.

We may remark that for medicinal purposes it is important to make use of the alcoholic extract of the bean, instead of the pure alkaloid, since the latter, both in its pure state and in combination with acids other than that of the bean, readily undergoes decomposition.—*Wittstein's Vierteljahresschrift Ph.* Bd. xiii. G. J. S.

[The article at page 365 of this number was printed before we received Wittstein. This translation is inserted as giving a clearer account of the chemistry of the subject.—Ed. Am. Jour. Pharm.]

SALICIN IN THE URINE.

Dr. Landeren has found that when salicin is administered in considerable doses it passes away in the urine unchanged, and can be easily separated from the evaporated urine by means of alcohol. —*Lond. Chem. News,* April 23, 1864, from *Archiv der Pharm.*, bd. c. xvi., s. 197.

THE MAGNESIAN LIGHT.

Photographers are indebted to the perseverance of M. Sonstadt for the removal of a great obstacle. Every one knows the difficulty which has hitherto been experienced in getting a powerfully actinic artificial light. Such a light is, however, furnished by the combustion of the metal magnesium, and, thanks to M. Sonstadt, this metal is now procurable at a price which makes it available for practical purposes.

Magnesium is an easily-inflammable metal. A wire of considerable thickness can be ignited in the flame of a candle, and the light evolved by the combustion is of great intensity. It has been ascertained that a wire of 0·297 millimetre diameter will give as much light as twenty-four stearine candles of five to the pound. The powerfully actinic character of the light has been recently demonstrated by Mr. Brothers, of Manchester, and Mr. Sydney Smith, both of whom have produced good pictures by its use.

The metal is neither ductile nor very malleable. It cannot be drawn, but by employing a method devised by Dr. Matthiesen, it can be forced in a softened state through a small opening in an iron cylinder, and thus strands of wire of considerable length can be formed. The wire has been found to burn more steadily when three or four strands are twisted into a rope; and a simple clockwork arrangement will deliver such a rope to a spirit or oil lamp, in the flame of which it may be burned.

We look for important results from the use of this light. The opportunities for its use are numerous; and we may expect our collections to be soon enriched with pictures of objects hitherto shut out from photographers.

Some are talking wildly of "night pictures," as though they expected, by means of magnetism, to obtain a picture of the gloomy effects of midnight on a scene. The principal use of the light will, of course, be for dark interiors; and we hope soon to see the magnificent grottoes of Adelsburg and Antiparos—which the pencil is as powerless to draw as the unaided camera to depict—revealed as brightly as the caverns in the glaciers, so well known to the photographers. Another Frith may also show us the wonderful passages in the interior of the Pyramids more clearly than they have ever been seen by the traveller with the help of the two or three candles which light his way through the dark labyrinth, and enable us at our own firesides to gaze with awe on the vast range of subterranean tombs at Serapeum. All these and many more objects are now open to an enterprising man, who will, no doubt, soon be found to avail himself of them.—*Chemical News, London, April 9th,* 1864.

RESPIRATION OF FRUITS.

M. Cahours has made an examination of the respiration of fruits; he considers that the fruit is one of the most important organs of vegetables, and that the examination of respiration should be by no means confined to the green part of the plant. He has endeavored to study the proportion of gases contained in the parenchyma of the pericarp and their composition; the action of fruit upon the gas of respiration, *i.e.*, oxygen, whether alone or mixed with nitrogen; the action upon the same gas of each of the envelopes of the fruit and of its fleshy part when it exists. It was found that apples, oranges, citrons, in a state of maturity, placed under bell jars containing oxygen, or mixtures of oxygen with nitrogen, consumed a quantity of oxygen, and furnished an equal amount of carbonic acid, the proportion being greater in diffuse light than in darkness. It is effected gradually up to a certain point, beyond which it augments considerably, and the internal face of the skin presents some alteration. The amount of carbonic acid produced increases with the temperature. The fruit acts in the same manner during the time elapsing between its losing its green color and its obtaining its maturity, and that of its obtaining its maturity and of its commencement of decay; but as soon as this has once commenced the amount increases rapidly. Determinations were made of the proportions of gases contained in the juices. To accomplish this, the fruit was squeezed under mercury, and the juice collected in a flask, to which was afterwards adapted a tube by a cork, but it was found that the same result was obtained if the juices were expressed in an ordinary press and afterwards placed in vessels. The gases were expelled by ebullition. Oranges, citrons, pomgranates, pears, and pippins gave quantities of gas diminishing in the order of the names; the gas consisted of carbonic acid and nitrogen in various proportions, but no oxygen, hydrogen, carbonic oxide, or carburetted hydrogen was found. A ripe fruit enclosed in air was found, to absorb hydrogen very rapidly, and if allowed to remain until it became soft, the juice was found to contain a very large quantity of gas rich in carbonic acid, the air in which it was enclosed containing carbonic acid also. It is intended to examine the gases contained in the juice from the commencement of development to the time when it has attained its complete maturity.—*Chem. News*, *London*, *April* 9, 1864.

ON THE ALCOHOLIC FERMENTATION.

By M. Bechamp.

The author remarks that two orders of ferments exist—one soluble, and therefore not organized, of which diastase may be taken as the type, the other organised, and therefore insoluble. The action of the former is invariable and specific; that of the latter, in a chemical point of view, is essentially variable, like that of all organized beings. The so-called fermentation of cane sugar set up by beer yeast is thus explained: The yeast plant first of all transforms cane sugar into glucose outside itself by means of a product which it contains ready formed in its organism, and which the author calls *zymase;* the plant then absorbs the glucose, digests and assimilates it, grows and multiplies, and finally throws off the used parts of its tissues in the form of the numerous compounds known as the products of fermentation, just as human beings throw out their waste in the form of urea, &c. According to this theory the alcohol, &c., must come from the yeast, and should be obtained from yeast perfectly free from glucose, which the author's experiments prove does in fact furnish alcohol. M. Béchamp found also that the *Mycoderma Aceti* in contact with cane sugar yielded alcohol, which it is thus seen may be formed without sugar by yeast, and with sugar by another organism similar to yeast. Hence it is clearly impossible at present to express the so called fermentation changes by an equation. The author considers them as a series of transformations which take place simultaneously or consecutively, and which may some day be individually explained by an equation comparable to that which expresses the change in starch under the influence of diastase. —*Chemical News, London, April* 16*th*, 1864.

A METHOD FOR PRESERVING THE COLORING MATTER OF LITMUS.

By Dr. Vogel.

It is well known that litmus tincture so frequently used in analytical researches, alters progressively, even in a closed vessel, and losing its blue color becomes yellowish brown. That this change of tint is the result, not of the destruction of the coloring matter, but of simple deoxidation, is shown by shaking the tincture in contact with the air, when the blue color will reappear. Litmus dye, as M. Mohr has remarked, may be conveniently preserved in open, partly-empty flasks, the mouths being lightly plugged with cotton, simply to exclude dust. The author has found, nevertheless, that litmus dye, especially in a slightly concentrated solution, becomes, after a time, turbid and reddish. The latter phenomenon is probably due to the carbonic acid of the air, for on being boiled the liquid resumes its blue color. M. Vogel now uses litmus die immediately before each experiment, with some litmus which he has found a means of preserving unaltered, and which he dissolves in water.

The preparation of this litmus is very simple. Take 16 grammes of commercial litmus, reduce it to a fine powder and put it into a cylindrical glass phial, with 120 cube centimetres of cold distilled water, and leave for twenty-four hours, taking care to stir occasionally. As the first portion of the liquid extract will contain all the free alkali of the litmus, it should be set aside, and on the residue should be poured a fresh quantity of 120 centimetres of distilled water; it should then again be left for twenty-four hours, and shaken at intervals. Then decant a second time and divide the liquid into two equal parts, and stir one part with a glass tube dipped in dilute nitric acid, repeating the addition of this acid by means of the tube, until the liquid becomes perfectly red. Then mix it with the other portion which has remained blue. The result is a reddish blue liquid. A litmus dye is thus obtained as neutral as possible, which must then be evaporated in a porcelain capsule, placed in a sand-bath, and kept below boiling point. There remains a granular, amorphous mass, which must be kept in a well stoppered bottle. This matter dissolves in water, leaving no residue, and gives a lighter or darker blue according to the quantity of water used, and has the advantage of furnishing a litmus dye at a moment's notice, and at any degree of concentration which may be required. If, for instance, it is desired to experiment with a standard solution, a piece of the above extract, about the size of a pin's head, put in a wine glass containing a little water, will yield a very convenient solution. This extract may be preserved in closed vessels for years without losing either its solubility or its blue color.—*Chem. News, London, April* 31, 1864., *from Journal de Pharmacie et de Chemie,* xlv. 70. 64.

IDENTITY OF ACONELLA WITH NARCOTINA.

Having received some time ago, from my friend, Mr. H. Draper, a specimen of the alkaloid discovered by Messrs. T. and H. Smith, of Edinburgh, in aconitum napellus, I thought it probable that some interesting results might be obtained by submitting a solution of the alkaloid to the action of polarised light. My object was to compare the change in the plane of polarization of a ray, produced by transmission through a tube filled with this solution, with the change similarly produced by a solution of narcotina. This I was enabled to do with very great accuracy by means of an instrument which I described at a meeting of the Royal Irish Academy in January, 1863.

The experiment was made as follows:—

1. I dissolved 2·95 gr. of aconella in 1½ cubic inches of chloroform, and determined the rotatory power of the solution. I then made a solution of narcotina of the same strength, and

measured its rotatory power in the same way. Had these powers differed from each other by the $\frac{1}{50}$th part, I could not have failed to see that they were unequal. No difference, however, could be detected.

2. Knowing the rotation produced by a solution of narcotina to be reversed by the addition of an acid, I was anxious to ascertain whether the same were true of a solution of aconella. In this experiment I was obliged to use as the solvent rectified spirit, inasmuch as the water contained in the dilute acid which I employed would have rendered the chloroform turbid. This made the experiment more difficult, narcotine being very sparingly soluble in spirit. In fact, I was with difficulty able to dissolve one grain of either substance in a cubic inch of cold spirit.

Having made two similar solutions of aconella and narcotina, I measured their rotatory powers before and after the addition of an acid. The results were as follows:—

a. In both cases the rotation was reversed.

b. Working by m, the ratio of the left-handed rotation produced by the solution of aconella to the right-handed rotation produced by the same solution when acidulated, and by m', the same ratio for narcotina, I found—

$$\frac{m}{m'} = 1{\cdot}02.$$

The acid used was hydrochloric, and was added in excess; the same quantity, of course, being used for each solution.

These results seem to leave little doubt of the identity of aconella with narcotina. I am, &c.

John H. Jellett,

Professor of Natural Philosophy to the University of Dublin.

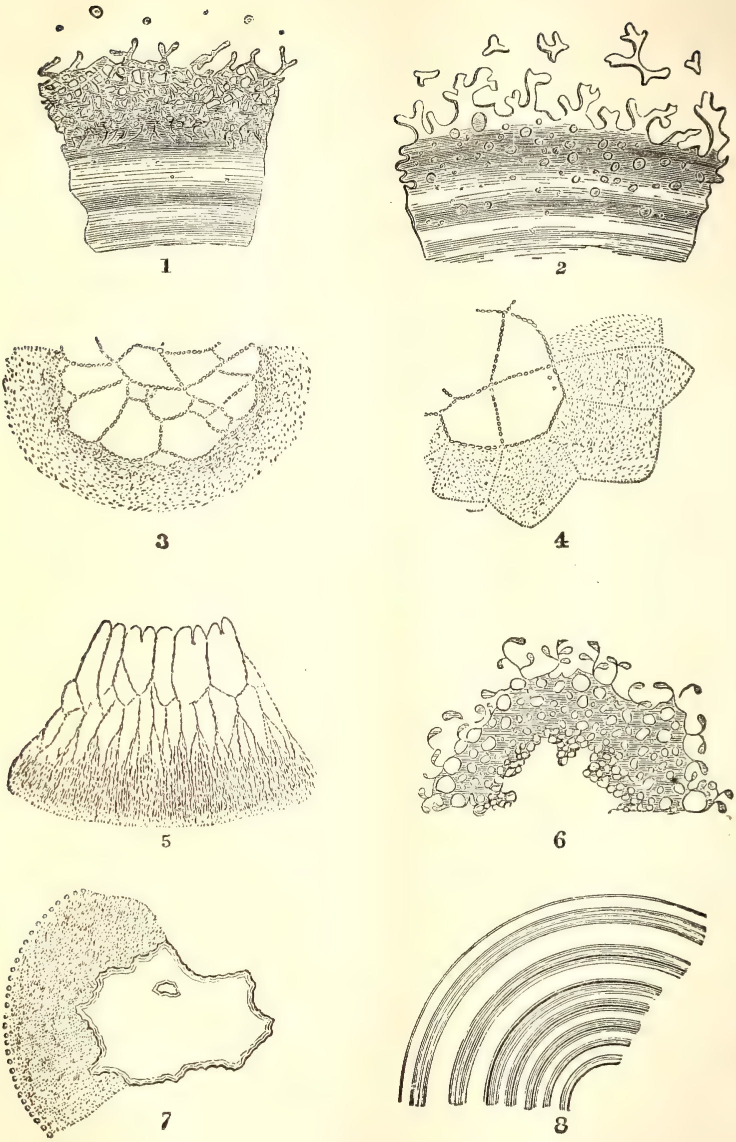
Trinity College, Dublin, April, 26.

Chemical News, London, April 30th, 1864.

SOME CURIOUS PROPERTIES OF OXIDE OF SILVER.

By M. Boettger.

M. Boettger has remarked that oxide of silver yields its oxygen to combustible matters quite as readily as does peroxide



Examples of the Cohesion Figures of Liquids.

From Pharmaceutical Journal, April, 1864.

(See pages 248 and 343 Amer. Jour. Ph., 1864.)

of lead PbO_2, which, on account of this property is very largely employed in the manufacture of chemical matches.

A very dry mixture of about two parts of oxide of silver and one of sulphur ignites by friction in a mortar, or even between folds of paper. It makes no difference if the antimony compound if replaced by black sulphide of antimony, realgar, or orpiment.

The same thus occurs with amorphous phosphorus as with tannin. Gallic acid does not induce combustion.

A drop of phenic acid or creosote poured on very dry oxide of silver causes an instantaneous flame.

Flour of sulphur also ignites when triturated with this oxide; selenium the same.—*Chem. News, London, May* 7, 1864, *from Journ. für Prakt. Chemie, xc.*, 32.

FURTHER REMARKS ON THE COHESION FIGURES OF LIQUIDS.

By Charles Tomlinson.

Lecturer on Science, King's College School, London.

A wish having been expressed that some of the diagrams of cohesion figures, exhibited during the reading of my paper on the 3d of February last, should be reduced and engraved on wood for insertion in the Journal, I think it due to the Society to make a few additional remarks in connection with these figures, which, as now presented, bear about the same relation to the originals as an engraving of a rainbow does to the real object. But although the exquisite beauty and harmony of color of some of these figures is thereby lost, yet a certain rough idea is thus given of their form and outline, so that any one working on this subject for the first time may get a notion of the kind of form he has to expect.

After the reading of my paper, a number of questions were put as to the variation of the figure by changing the surface, etc., and I stated that water seems, in all respects, to be best adapted for the exhibition of these figures. In a paper published in the "Philosophical Magazine" for March, 1862, some particulars are stated respecting variations in the figures arising from changes in the adhesion surface. Thus, a drop of water gently delivered to the surface of sulphuric acid from the end of a pipette, flattens down into a well-defined disk about the size of a shilling, marked with radial lines; these disappear at the centre, while fragments remain for some seconds, near the circumference. Alcohol, ether, benzole, etc., on sulphuric acid give striking figures, showing how remarkable is the change when the adhesive force of the surface is varied by the substitution of some other liquid for water.

When acetic acid is used as the adhesive surface, a new set of figures is obtained. Thus, oil of camphor, which on water forms a large well-developed film, produces only a small disk on acetic acid (sp. gr. 1·045), which disk sails about with considerable agitation, throwing off numerous globules. Oil of lavender also forms a small disk, which gathers itself up with strange contortions, and illustrates in its own way the struggle that is going on between cohesion and adhesion.

A question was also asked respecting cod-liver oil, when I stated that a specimen (A), supplied to me as pure, gave a certain figure; that a specimen (B) purchased at a shop gave another figure; but that on mixing two-thirds of common fish oil with one-third of A, I obtained a figure almost identical with that given by B.

The first in the accompanying page of engravings is a portion of the figure of castor oil. Of course it will be understood that all these figures are complete disks or circles, of which portions only are here represented. They are produced on the surface of water contained in a shallow glass about four inches in diameter.* The following experiments were made on the 10th and 11th of March in these new glasses. They were not made under very favorable circumstances, as the temperature of the room was under 50°; whereas it should not have been less than

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* I have lately ordered a number of glasses resembling large claret-glasses; each glass stands on a wide foot, and the stem is rather long, for the convenience of handling; so that the hand need never be brought into contact with the inner surface of the glass. After an experiment, a jet of water from a tap will often get rid of all traces of the oil of a former experiment. Should it not do so, the caustic potash solution must be used; and should this fail, sulphuric acid must be resorted to. A glass is left at the Society's house, for inspection by members.

about 60°. Two specimens of East India castor oil, supplied by an importer, were tried. The first, a colorless, viscid oil, gave a good figure, though small, probably due to the low temperature. The second, which had a slight tinge of brown, gave a good figure, rather larger than the first. Two other oils from the same house also furnished capital figures.

Three other specimens were furnished by Messrs. Baiss, Brothers. The first, East Indian, a bland, viscid, colorless oil, produced an admirable figure. The second, Italian, prepared "from the finest decorticated seeds," was a sweet, bland oil, and gave even a still finer figure, the colored rings being very persistent. The third, which has been in my possession nearly three years, and produced the figure from which my description and large diagram were taken, is still as good as ever. An oil, bought about the same time at a druggist's, produced a figure by no means so good; it did not open so freely, nor were the colors so bright as with the finest oils, but the residual figure was good, and I am not able to say but that it was a pure oil.

A specimen from the Jamaica Court of the International Exhibition was of a yellow-brownish color; the taste rather acrid. The colored rings of the figure were finer than in the former specimens, but the lace-like border was not so well developed, and the perforations were smaller.

Another specimen from the Italian Court of the International Exhibition, gave an admirable figure; it opened well with very persistent colors. The silvery corona also opened into innumerable small well-shaped circular holes before the lace-like pattern was developed. The outer colored rings were also perforated.

A specimen from the India Museum, a colorless oil, gave an exquisite figure: another, from the same source, an opaque specimen of a yellowish color, gave a very small figure, only about half the usual size; the residual figure was not like that of the other specimens, and it soon gathered itself up into a small disk.

I am not sufficiently acquainted with the commercial treatment of castor oil to make any remarks on the change of figure likely to arise therefrom, but I give these details respecting a dozen specimens from different parts of the world to show how constant is their behaviour in the production of a characteristic cohesion-figure.

Fig. 8 is a portion of the Balsam of Copaiba figure. I had only three specimens of this balsam to operate on. The first, which is two or three years old, from a wholesale house in the city, gives a splendid figure, consisting of large iridescent disks apparently growing out from under each other and quickly subsiding into a colorless disk with a sharp well-defined edge, just within which appears a string of very minute bosses, which it requires a sharp eye to detect. In the course of ten or fifteen minutes the film does not open into holes, as many films do, but becomes dotted over with pit-like depressions, which enlarge, and gradually the base of each pit opens into a minute network. These particulars I did not stop to describe at the meeting, but they are given in my original description of the figure.

A second specimen, of a brownish color, gave a very good figure, though not quite so large as that of the first, but it behaved in all respects like it. A third specimen, much more fluid than the above,* shot out rapidly with much less development of color, and often without any color at all. The film was large, the bosses at the edge larger and flatter than in the two former specimens, and not so well defined. A fourth was a specimen of the essential oil of copaiba. It opened with a sudden flash of colored rings, forming a colorless disk over the whole surface with no bosses at the edge.

On thinning down the second specimen with oil of turpentine a colorless film was produced similar to that of the third.

The second specimen was also mixed with $\frac{1}{3}$, $\frac{1}{2}$, and nearly $\frac{2}{3}$ castor oil, (No. 1 castor oil in my twelve specimens being used), and in all cases a film entirely devoid of color was produced. The splendid iridescent disks of the balsam, and the rainbow-rings of the castor were entirely absent in the mixture of the two, in consequence of the increased thickness of the resulting

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* The specimens Nos. 2 and 3 were in long narrow bottles, nearly full. A rough measure may be given of their comparative viscidity when it is stated that on inverting No. 2, the bubble of air under the cork reached the other end while 8 was counted; in No. 3 it travelled through the liquid while counting 2.

film. The mixtures were made in a test-tube held in warm water, and stirred with a glass rod.

Fig. 2 is a portion of the figure of a sample of croton oil, of a brownish-amber color: this opened into splendid rings, which quickly disappeared, when the film retreated upon itself, leaving a minute spray of oil. Another specimen which I have had by me about two years, opened with a fine display of rings, and a corona which formed a large perforated pattern, when the film gathered itself up, and left a train of oil behind. The figure was like that of the first, only in the gathering up, the edge of the film was torn away. A specimen from the Dutch court of the International Exhibition, probably from Java, flashed out into a small figure with iridescent rings, and immediately retreated upon itself. A fourth, from the India Museum, of a light amber color, required to be warmed. It formed a remarkable and beautiful figure, but the display of the usual phenomena was arrested by chilling, a dull frosty silvery appearance coming over the figure, which though very beautiful, prevented the film from telling its history. This oil set and became opaque a little below 50° F. A fifth specimen purchased by me seven or eight years ago in Prussia, gave a very good figure.

Figs. 3 and 4 are portions of the figures of olive oil. Fig. 3 is from a specimen marked "extra sublime," Fig. 4 from a specimen marked "Tuscany, fine." The enormous demand for olive oil offers a great temptation to the use of cheaper oils. In this country the oil of sessame seed is used either instead of olive oil or for mixing with it, while in France poppy-seed oil is largely employed for the purpose. Figures of these are given, Fig. 5 being that of sessame, and Fig. 6 that of poppy.* These oils, together with lard oil, Fig. 7, are also used for mixing with some of the medicinal oils.

A good deal of interest is just now felt respecting linseed oil. I have lately performed a number of experiments with it, an account of which I must reserve until the Journal can better afford space for such minute details.

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* The experiments which furnished these figures were performed in winter in a warm room, and the oils had to be warmed before they could be used.

I may, however, remark in conclusion that the greatest precaution must be taken in ensuring the purity of the glasses used in obtaining cohesion-figures. I have repeatedly found that after glasses have been used with fatty oils they produce nothing but failures, until they have been well washed with caustic potash or sulphuric acid. There may be cases where spirits of wine will be found more convenient than potash, especially in the case of some of the essential oils which do not readily saponify.

P. S.—Since writing the above, I have made some inquiries respecting the commercial treatment of one or two of the oils operated on, and I have also visited the laboratory of a wholesale druggist, where castor oil, as imported, is purified by filtration through bags at a steam heat.

What is called "English croton oil" is pressed in this country from imported seeds. Very little oil is so made at present, on account of the trouble in preparing it. There is much difference in the appearance and character of samples, even from the same case or package. One will remain fluid at a low temperature, and another will set speedily into a pasty mass. This may be partly due to the mode of pressing, whether cold or hot, as some oils pressed hot from the seeds or nuts will be harder than oil pressed cold from similar seeds. This has been proved by careful experiments on cocoa-nut oil. It is believed also that some croton is made by pressure and other samples by boiling the seeds which have been first stripped of their outer skin or husk. This may affect considerably both the melting-point of the oil, and also its chemical character, since resinous substances may be brought out in one case and not in another. Similar differences as to melting-points are found in castor oils, and it is not always easy to equallize them even by filtration at the same temperature, as some oils will carry with them more stearine than others. This, my informant knows to be the case, from his own experience in oils. If two oils were cooled and filtered alike, one of which is quite neutral, and the other partly acidified, the latter would be more fluid after filtration than the other. The neutral stearines do not crystallize freely like the acid hard fats. They usually form masses of fine hair-like crystals, which do not separate readily from the oily part, so that a certain proportion will pass through with the oil. The

The acid fats crystallize out in the form of hard plates or concretions, which bear handling without breaking down, and can be completely separated by filtration.

Again, if two oils pressed from the seeds were packed, one quite clean, and the other more or less contaminated with gum or mucilage, the latter would become more or less acidified, the gum, etc., apparently fermenting, and then setting up an acidifying action in the oil. This may explain some of the differences in the working and character of oils.

Such being the accidents to which commercial oils are liable, I cannot wonder at variations in their cohesion figures, but I do very much wonder that twelve different samples of castor oil should have given figures so much alike as in every case to enable a practised operator to identify the oil, and also, in the case of four specimens of croton oil, one of them solid at ordinary temperatures, all the figures should have a resemblance sufficient for their identification.—*Pharm. Jour.*, *London*, *April*, 1864.

ON WRIGHTINA; AN ALKALOID CONTAINED IN THE SEEDS OF WRIGHTIA ANTIDYSENTERICA.

By John Stenhouse, LL.D., F.R.S.

The *Nerium antidysentericum* of Linnæus, *Wrightia antidysenterica* of Robert Brown and modern botanists, is a tree belonging to the order *Apocynaceæ*, indigenous to various parts of India, and occurring also in Ceylon. Under the name of *Conessi Bark*, or the Malay name of *Codago-pala*, its bark was introduced into Europe about the middle of the last century as a valuable remedy in dysentery, diarrhœa, and fever, but it apparently soon fell into disuse, and is now almost forgotten. In India, however, it still maintains its reputation, at least among the native physicians. The seeds of the tree, called in Hindustanee *Inderjow*, and in Arabic *Lissan al asafeer* (literally, birds' tongues), are reputed to resemble the bark in their medicinal properties. Mr. Waring, of Travancore, in a recent essay "On the Principal Indigenous Tonics of India," states that Wrightia seeds are reckoned serviceable in dysentery, diarrhœa, fevers, flatulence, bilious affections, etc. In the treatment of hæmorrhoids they are given in the form of decoction made with milk, and regarded as most efficacious.

I am indebted to Mr. Daniel Hanbury for the above description, and also for a quantity of the seeds.

The seeds, which contain a large quantity of a fixed oil, were reduced to a coarse powder by pounding,—an operation which is accomplished with some difficulty, owing to their greasy nature. The pounded seeds were then placed in a displacement apparatus and treated with a considerable quantity of cold bisulphide of carbon, in order to remove the fatty matter. The seeds were then heated in an open vessel until the mechanically-contained bisulphide of carbon was driven off, and they were afterwards extracted with boiling spirit of wine. The fatty matter which is extracted by sulphide of carbon from *Wrightia seeds*, and which is present in large quantity, is a fixed oil, which does not solidify at a temperature considerably below 32° F. When digested with caustic alkalies it is slowly decomposed, giving a solution of soap, from which acids precipitate a fat becoming semisolid when cold.

After the alcohol had been removed by distillation from the alcoholic extract of the seeds, prepared in the manner described, the residue, which consisted chiefly of crude wrightine, contaminated, however, with fatty matters, gum, etc., was digested with a small quantity of dilute hydrochloric acid, and filtered. The clear solution, if tolerably concentrated, when treated with ammonia or carbonate of soda, yielded an abundant flocculent precipitate, the solution at the same time becoming of a deep green color. The wrightine was collected on a filter and washed with cold water. When ignited with soda-lime it evolves alkaline vapors and a basic oil, which solidifies to a resin on cooling.

Wrightine is moderately soluble in boiling water and in boiling spirit of wine, and but slightly so in ether or bisulphide of carbon. I have not succeeded in obtaining it, or any of its salts, in a crystalline state.

Wrightine readily dissolves in dilute sulphuric, nitric, hydrochloric, oxalic, or acetic acids ; but the solutions, however highly concentrated, only yield a resinous deposit, without the slightest trace of crystallization.

Both wrightine and its salts have an extremely persistent bitter taste.

When digested with strong nitric acid it readily dissolves, giving off red fumes, and becoming oxidized into oxalic acid without the formation of any picric or similar acid.

Decoction of galls produces an abundant flocculent precipitate in a solution of wrightine, in acetic acid; this precipitate is soluble in hydrochloric acid.

Bichloride of platinum in solutions of wrightine in hydrochloric acid, gives a pale yellow precipitate, which is not crystalline.

Terchloride of gold a similar precipitate, only of a somewhat paler color.

Perchloride of mercury in solutions of wrightine produces an abundant white flocculent precipitate. When the pounded seeds are boiled for some time with very dilute sulphuric acid, and rapidly filtered through a bag filter, the solution deposits on cooling a flocculent precipitate, which is difficult to collect, as it soon stops up the pores of the filter. On heating this precipitate after it has been freed from sulphuric acid by washing with cold water, it chars and burns, evolving an odor similar to that of burnt starch.

It is insoluble in spirit of wine, but soluble in dilute sulphuric acid, from which it again separates on cooling.—*Pharm. Jour., London, April,* 1864.

PHARMACY IN JAMAICA

We extract the following from the *Jamaica Guardian* of January 8, 1864:—

"Several parties have applied to us to know what are the provisions of the Bill which has been introduced into the House of Assembly by the Government to provide for the registration of chemists and druggists in this island, we take the earliest possible opportunity of giving a synopsis of the measure. The first clause provides that upon the passing of the Act, the Island Secretary shall be the registrar, and the office of enrolment the registry office, of duly qualified chemists and druggists. The third enacts that every person who, having obtained a certificate of his competency to compound and dispense medicines; actually compounded and dispensed medicines and drugs as a chemist and druggist in this island previous to the passing of the Act, shall, on payment of a fee of ten shillings to the registrar, and production to him of such certificate, and a declaration, or of a declaration where the certificate has been lost or cannot be found, according to a form set forth in the Act, signed and declared to by him, be entitled to be registered as a duly qualified chemist and druggist. The fourth clause is to the effect that it shall be lawful for any two duly qualified and registered medical practitioners in this island, on the application of any person who may have served an apprenticeship of three years to a duly qualified and registered practitioner of medicine and surgery in this island, and who is desirous of being certificated to act as a druggist, to examine such person touching his qualifications to act as such, and, upon being satisfied thereof, to grant to such person, under their hands and seals, a certificate of his qualification to compound and dispense medicines, drugs, and chemicals, which certificate shall bear a stamp of twenty shillings; and such person shall record the certificate in the office of enrolments in this island, and be entitled upon doing that, and that upon the payment of a fee of ten shillings to the registrar, to be registered as a duly qualified chemist and druggist. The fifth clause provides that after the passing of the Act no person shall presume to compound and dispense any medicines, drugs, and chemicals as a druggist, or in any manner to act as such within this island, without having first duly recorded in the manner aforesaid the certificate he may be possessed of, and being registered according to the provisions of the Act. The following are the remaining clauses of the Bill, *verbatim* :—

"Sixth.—Any person who shall, after the passing of this Act, pretend to be, or take or use the name of druggist, or any name or description implying that he is a registered druggist under the Act, or shall dispense drugs and charge for the same, even though the money has not been received, shall, upon a summary conviction before any two justices of the peace, pay a fine not exceeding [*ten*] pounds; but nothing in this act contained shall be construed to extend to prevent any person from vending patent medicines without being registered as a druggist.

"Seventh.—The registrar shall, on the (first) of (July), one thousand eight hundred and sixty (four), and (first) day of (January), one thousand eight hundred and sixty (five), and on every succeeding (first) day of (July) and (January), or within (thirty) days thereafter, cause to be published in the 'Jamaica Gazette,' by authority, a list, signed by him, of the names, in alphabetical order, according to their surnames, of the several chemists and druggists on the register on every such (first) day of (July) and (first) day of (January), under a penalty of (twenty) shillings for every neglect.

"Eighth.—A copy of the 'Jamaica Gazette,' by authority, containing a list of the names of chemists and druggists, published as by this Act is directed, shall be evidence in all courts, and before all justices of the peace and others of the registration, according to the provisions of this Act, of the several persons whose names are mentioned therein.

"Ninth.—Upon the passing of this Act, the Governor shall appoint in every parish of this island one or more qualified practitioners of medicine and surgery, who shall have power and authority, and are hereby required, at reasonable and convenient times, as often as to them shall seem expedient, to enter into any shop, store, or house of any person whatsoever in which medicines, drugs, or remedies for internal or external use are kept or prepared for sale, and to search, survey, prove, and determine if the same medicines, drugs, and remedies shall be of good, sound, and wholesome quality, and cause to be burnt, or otherwise destroyed, all such medicines, drugs and remedies as they shall find false, adulterated, corrupt, or decayed; and every person who shall obstruct, or cause to be obstructed, any such authorized practitioner of medicine and surgery in the execution of his said duty, shall be subjected to a penalty not exceeding [*ten*] pounds.

"Tenth.—All persons vending poisons, or poisonous drugs, shall keep the same in a separate place, under lock and key, under the penalty of [*thirty*] pounds.

"Eleventh.—Any penalty imposed by this Act may be recovered in a summary manner before two justices of the peace of the parish or precinct wherein the penalty was incurred, and may be proceeded for and recovered or enforced under the provisions of the thirteen Victoria, chapter thirty-five, or any Act now or hereafter to be in force relating to summary proceedings; and, when recovered, one-half thereof shall be carried to the credit of the general revenue of this island, and the other half be given to the informer or prosecutor : and such informer shall, notwithstanding, be a competent witness for the prosecution in the case.

"The measure stands for a second reading in the House, and we hope it will meet with the careful consideration which it deserves from honorable members. There can be no doubt that legislation is required in this direction, as it is notorious that there are many individuals in different parts of the island engaged in the vending of drugs who are utterly unqualified for such an occupation. We venture to say that in no country is such license permitted in this respect as is allowed in Jamaica. It is high time that some remedy to this state of things should be devised; and we trust that the 'collective wisdom' of the country will be able, without prejudice to existing interests of a legitimate character, to impose some effectual check upon the indiscriminate and careless way in which medicines are now vended throughout the country."—*London Pharm. Journal, April,* 1864.

UTILIZATION OF BRINE.

At the usual meeting of the Philosophical Society of Glasgow this week, a very important paper was read by Alexander Whitelaw, Esq., 55 Sydney Street, entitled "A Practical application of Dialysis." The paper set out with a detailed exposition of the discovery of, and experiments in, dialysis by Mr. Graham, of the Mint, after which Mr. Whitelaw stated the result of a process of his own for utilizing the brine of salted meat. When fresh meat, he said, had been sprinkled with salt for a few days, it was found swimming in brine. Fresh meat contained more than three-fourths of its weight of water, which was retained in it as in a sponge. But flesh had not the power to retain brine to that extent, and in similar circumstances it absorbed only about half as much saturated brine as of water, so that under the action of salt, flesh allowed a portion of its water to flow out. This expelled water, as might naturally be expected, was saturated with the soluble nutritive ingredients of the flesh; it was, in fact, juice of flesh—soup, with all its valuable and restorative properties. In the large curing establishments of this city very considerable quantities of this brine were produced, and thrown away as useless. This was the material to which Mr. Whitelaw has applied the process of of dialysis, and he thought with success, for the removal of the salts of the brine, and for the production, at a cheap rate, of pure fresh extract of meat. His process he stated as follows: The brine, after being filtered to free it from any patricles of flesh or other mechanical impurities it might contain, was then subjected to the operation of dialysis. The vessels or bags in which he conducted the operation might be made of various materials and of many shapes; but whatever might be their material or shape, he called them "dialysers." Such an apparatus as the following would be found to answer the purpose;—A square vat made of a framework of iron filled up with sheets of skin or parchment paper in such a way as to be water tight, and strengthened, if necessary, by stays or straps of metal. The sides, ends, and bottom being composed of this soft dialysing material, exposed a great surface to the action of the water contained in an outer vat, in which the dialyser was placed. He found a series of ox-bladders fitted with stop-cocks, or gutta percha mouth-tubes, and plugs, and hung on rods stretching across and into vats of water, a very cheap and effective arrangement. He could also employ skins of animals either as open bags or closed, and fitted with stop-cocks or bags of double cloth, with a layer of soft gelatine interspersed between them. Other arrangements would readily suggest themselves, and might be adopted according to circumstances. But supposing the bladder arrangement was taken, which he thought would be found practically the best, being cheap, easily managed, and exposing a great surface to a dialytic action. / The bladders were filled with the filtered brine by means of fillers, and hung in rows on poles across, and suspended into vats of water. The water in those vats was renewed once a day, or oftener if required, and he found that actually at the end of the third or fourth day, according to the size of the bladders employed, almost all the common salt and nitre of the brine had been removed, and that the liquid contained in the bladders was pure juice of flesh, in a fresh and wholesome condition. The juice, as obtained from the "dialysers," might now be employed in making rich soups without any further preparation, or it might be concentrated by evaporation to the state of solid extract of meat. Mr. Whitelaw, at this stage, requested a friend present to heat a portion of the juice of flesh so as to produce a soup, and he asked the members to taste it and experience the result. He also had prepared more carefully a soup from the brine, to which he directed attention. (Both were found to be very palatable.) The brine used, he continued, was from one of the most respectable curing-houses in Glasgow, and was perfectly pure and wholesome. The liquid from the dialysers might be treated in several ways. It might be evaporated in an enamelled vessel to a more or less concentrated state, or to dryness, and in these various conditions packed in tins or jars for sale. It might be concentrated at a temperature of 120 degrees, by means of a vacuum pan or other suitable contrivance, so as to retain the albumen and other matters in a soluble form. Again, the more or less concentrated liquid might be used along with flour used in the manufacture of meat biscuits. The products he had named were all highly nutritive, portable, and admirably adapted for the use of hospitals, for an army in the field, and for ships' stores. The dialysis of brine might be conducted in salt water, so as to remove the greater portion of its salt, and the process completed in a small quantity of fresh rain, or other water. In this way ships at sea might economize their brine, and so restore to the meat in a great measure the nutritive power that it had lost in the process of salting. Thus then, Mr. Whitelaw said, he obtained an extract of flesh at a cheap rate, from a hitherto waste material. Two gallons of brine yielded one pound of solid extract, containing the coagulated albumen and coloring matter. For the production of the same directly from meat, something like tweuty pounds of lean beef would be required. The quantity of brine annually wasted was very great. He believed he was considerably under the truth when he said that in Glasgow alone 60,000 gallons were thrown away yearly. If they estimated one gallon as equal to seven pounds of meat in soup-producing power, then this was equal to a yearly waste of 187 tons of meat without bone. Estimating the meat as worth sixpence per pound, this amounted to a loss of £10,472. In this way the waste over the country must, he said, be very great. In the great American curing establishments the brine wasted must be something enormous, as he found that in eight of the Federal States, 4,000,000 pigs were slaughtered and cured last season. Mr. Whitelaw concluded by quoting from from Gregory and Liebig as to the value and efficacy of extract of meat.

At the conclusion several gentlemen expressed their approval of the paper, and the desirability of such a practical application of dialysis as that described by Mr. Whitelaw.—*London Pharm Jour.*, *April,* 1864, from *North British Daily Mail*, *Feb.* 27, 1868.

CINCHONA NEWS.

By C. W. Quin, F. C. S.

In the *Technologist* for February there is a very interesting paper on cinchona culture in Jamaica, by Nathaniel Wilson, the island botanist. The quinine-yielding cinchonæ were introduced into the island in the autumn of 1860 by means of seeds, and by the month of October in the year following Mr. Wilson had the satisfaction of possessing over four hundred healthy young plants ready for planting out. The selection of too warm a site, however, killed nearly all of them, and it was found necessary to transplant the remainder to a much colder situation, the climate and soil of which proved to be all that could possibly be desired. Some of the plants of the *Cinchona succirubra* have attained a height of six feet, having a circumference at the base of the stem of four and a half inches. The grey barks *C. nitida* and *C. micrantha* being slower in growth have not reached so large a size. So far the experiment has proved highly successful, and Mr. Wilson states that it would be difficult to find more healthy fruit trees in the neighborhood. It is calculated that in about four or five years the plants will yield seeds; in the mean time they can be successfully propagated by cuttings and layers. It seems that the climate and soil of the higher and many of the intermediate mountains in the island are particularly well suited for the growth and propagation of the most valuable of the cinchonæ, *C. succirubra*. The *Pharmaceutical Journal* for last month also contains several notes on the subject of the cinchonæ. A paper, read by Mr. John Eliot Howard at the January meeting of the Pharmaceutical Society, states that recent importations of Calisaya bark from Bolivia contain an unprecedented admixture of the root bark, which is, however, easily distinguished by its peculiar characteristics, more especially its curly shape. A very favorable specimen gave only from 8 to 10 parts of alkaloids per 1,000, or about one-tenth the richness of ordinary Calisaya bark. The suicidal Bolivians, who have hit on the most certain method possible of extirpating the finest species of bark from their forests, are, it appears, much disappointed at the low estimation in which the root bark is held in Europe. Mr. Howard and Professor Bentley afterwards entered into some very interesting particulars with regard to the formation of the alkaloids in the living plants, for the details of which we must refer the reader to the original paper. The same number contains the report by Mr. Howard to the Under Secretary of State for India on the bark and leaves sent home in October last from the Government Cinchona Plantations at Ootacamund by Mr. McIvor, the superintendent. In a note accompanying the bark and leaves Mr. McIvor states that they were removed from the plants during the rains, that is to say when the sap was in full flow, the object being to ascertain how far the period of the year at which the bark was gathered affected the supply of alkaloids. The plants under cultivation give unmistakable signs that they do not require so rainy a climate as they are represented to thrive under in the Andes, the grey barks, especially, having suffered from the unusually wet season. In speaking of the leaves, Mr. Howard says, "I regret to be obliged to confirm the opinion I expressed in my last, that the leaves will not supply material for the extraction of quinine." The first rough precipitation from an acid solution only amounts to 1·31 per cent. The alkaloid seems to exist in the leaves in intimate connexion with the coloring matter. The latter substance promises to be very interesting, being somewhat analogous to indigo. Its solution by reflected light is blood red, by transmitted light a fine green. Mr. Howard expects that the investigation of this substance will throw much light on the formation of alkaloids in the plant. With the exception of the specimen of the bark of the *Cinchona Pahudiana*, the value of which as a quinine-yielding plant is questionable, all the others yielded very satisfactory results. They were all, however, in too small portions for extensive examination.

A correspondent of the Journal states that the hydrochlorates of quinine, quinidine, and cinchonine may be distinguished from the sulphates of the same alkaloid by their fusing and giving off purple fumes when heated in platinum foil. It seems that samples of the hydrochlorate of cinchonine have been lately passed off as sulphate of quinidine.

Strecker, by boiling monobrominated cinchonine with an alcoholic solution of potash, and passing through it a current of carbonic acid, has succeeded in forming a substance having precisely the same composition as quinine, but possessing different properties. It will be remembered that cinchonine differs from quinine in having two equivalents less of oxygen. The new substance which possesses the properties of an alkaloid has been called by Strecker oxycinchonine. It crystallizes in colorless plates, and differs from quinine in not giving fluorescent solutions. Its salts crystallize with difficulty, the most crystallizable being the neutral sulphate and oxalate. It remains to be seen whether its therapeutic effects are also different.—*Chemist and Druggist*, *March* 15*th*, 1864.

HOW TO PRESCRIBE AND HOW TO WEIGH IN GRAINS.

Although the toils of practice have compelled us, as they have most of our readers, to look upon chemical manipulation as a thing only to be taken up on some rare occasions, yet, sitting with a good balance and set of accurate grain-weights in our study, we cannot help wondering why so many who prescribe and dispense, and why the Medical Council which issues regulations for both processes, should prefer an intricate and obscure system of weights to one that is simple and obvious at first sight to every one.

In our present remarks we confine ourselves to dispensing and prescribing; as for manufacturing, that is no business of the practitioner. The Medical Council have thought fit to give formulæ for the manufacture of drugs on the large scale, which manufacturers may laugh at or adopt, as they please; and for processes such as these, the pound, with its even binary divisions of half, quarter, eighth, etc., and the ounce, with similar divisions, may be convenient and sufficient.

But we do not prescribe pounds or ounces for our patients. *The real unit* for this purpose *is the grain.* Every one who prescribes knows how many grains or fractions of grains he wishes the patient to take; and whether he direct one dose or many to be made up, the necessary calculation is trivial, and involves no difficulty whatever. And it is far easier to write down any given number of grains at once, than it is to first reduce them to drachms, or fractions of drachms, or scruples.

It will be more convenient under this new system to use Arabic numerals than Roman. Most of us now write in English the directions how medicines are to be taken. We have done so, since a chemist's lad once translated "cyath. vin. aquæ," as "a glass of wine and water." The substitution of the Arabic numeral will be but one step towards abolishing Latin altogether, a thing which, however regretted, is inevitable.

Prescriptions are already half English. When we see "grs. xx.," we are fain to advise the prescriber not to jumble Latin and English together in one phrase, but to choose whichever of the two tongues he understands best, and write wholly in that.

Suppose, then, we wish to write a prescription for eight doses, each containing eight grains of carbonate of ammonia, ten of bicarbonate of potass, and fifteen of nitrate of potass,—

℞. Ammoniæ carb., gr. 64; potassæ bicarb., gr. 80; potassæ nitratis, gr. 120; aq. destillatæ, fl. oz, 8; m. ft. mist.

Sig.—"One fluid ounce by measure to be taken every four hours, with half a fluid ounce of lemon-juice, and the same of water."

Such a mode of prescribing quantities would answer every purpose There could be nothing gained by writing "gr. lxiv.," nor yet "ʒj. et gr. iv.," instead of "gr. 64," and so with the other quantities. To use scruples or drachms and Roman numerals would be to get into a calculation for no other purpose than to get out of it again.

Suppose a man has to perform a simple chemical determination,—say, the solid contents of a decigallon of water from some water-works,—first he weighs a capsule, which equals, say, 413·98 grains; (2) after evaporating the water therein, and drying at 250°, it weighs 416·4 grains; (3) after drying still further, 416·35 grains. This number is adopted, giving as the total solid impurity, viz., the difference between the first and third weighing, multiplied by 10, as per gallon, 23·7 grains.

These results are seen at a glance. But what chemist, except his head were stuffed with straw, would write down, instead of the above figures, "Weight of capsule, ʒvj., ℈ij., gr. xiij., et xcviij. partes grani e centum; after evaporation, ʒvj., ℈ij., gr. xvj., et xxxv. partes grani e centum; weight of solid residue per gallon, ℈j., gr. iij., et septem partes grani e decem?"

If chemists do not vex their souls with these antique intricacies, why should we? But if the manner of expressing quantities in grains be easy, infinitely more so is the actual weighing, if, instead of the odious Apothecaries' weights, we have a set of plain grain-weights.

With the Apothecaries' weights they give ʒij., ʒj., ℈ij., ʒ ss., ℈j., ℈ss., besides grain-weights stamped to represent 6, 5, 4, 3, 2, and 1 grain.

It is practically difficult to distinguish between ℈ij. and ʒss., and it takes up a good deal of calculation to make up odd numbers of grains.

A box of good chemical grain-weights, on the contrary, has them in regular sets of four, out of which any combination can be made immediately by the simplest process of addition. The grain weights are made of wire, bent in such a way that each gives its value at a glance.

The highest set of weights, for hundreds of grains, is—600, 300, 200, 100. The next, for tens—60, 30, 20, 10. The third, for grains (of platinum wire)—6, 3, 2, 1. The fourth, for tenths (of platinum wire)—·6, ·3, ·2, ·1. Hundredths may be had in gold wire, but are not necessary, and tenths can seldom be wanted in dispensing.

It may be seen at a glance, first, that the series of "tens of grains" harmonizes with ʒj., ʒss., ℈j., and ℈ss., if any one loves the old system and chooses to use it. Secondly, that out of the above numbers any intermediate number can be formed. And it may be added, thirdly, that the custom of putting weights into the scale-pan in regular order is useful, like all other chemical processes, as a means of teaching exactness and order.—*Lond. Pharm. Jour., April,* 1864, from *Med. Times and Gazette.*

THE STATE OF PHARMACY IN RUSSIA AS COMPARED WITH THAT IN ENGLAND.

The condition of the pharmaceutical profession is of the greatest public importance. After the medical profession, the pharmaceutical commands the greatest consideration, not of Government alone, but also of the public at large. The science of "pharmacy" is so closely linked up with the science of medicine, that it may well be said one cannot effectually exist without the other; but at the same time, it must be understood that these professions, however intimately related, must be kept distinctly separate. The branches of science which must necessarily be known by the followers of these professions have reached such a wide spread development, that should they continue to progress at the same rate, it will soon be impossible for *one* individual to obtain a thorough knowledge of all of them. The fact of medical men possessing a full knowledge of their profession, but devoting themselves to the study and practice of special diseases only, shows the correctness of the above assertion. This admitted, and it becomes evident that either of these professions has in itself sufficient upon which a man's whole energies should be devoted; and considering also the progress of science, and the necessity for public safety, it cannot be surprising that the feeling is daily-increasing that pharmacy should be raised to a level with other professions, and *cease* to be a trade.

On the Continent, the title of "Apothecary," and the right of selling medicine, is limited to those only who have obtained the degree of "Apothecary;" and even these are bound by oath to adhere, under the penalty of being deprived of their diploma, to certain laws, the object of which is the safety of the public.

In Russia, where they have copied from Germany almost all the laws and regulations relating to learned institutions, the following system works with the greatest and most efficient success. Every one who wishes to become an "Apothecary" has to show his certificate of having passed with efficiency through the first four classes of the Government school in a certain allotted time, viz., four years. During this period the candidate will have been examined in the following subjects:—the Latin tongue, the Greek, Russian, German and French languages; arithmetic, mathematics, history, geography, and natural history.

The candidate is then admitted an apprentice in a "pharmacy" or pharmaceutical establishment, having been duly registered at the "Medical Police." During his apprenticeship he has ample opportunity of learning practically the following subjects:—

Pharmacopy, pharmacognosy, pharmaceutical chemistry, botany, practical dispensing, and the reading of the most abbreviated prescriptions.

At the expiration of three years he passes, at one of the University Colleges, a theoretical and practical examination of the above-named subjects. If found efficient, he attains the degree of "Subject," which entitles him to the situation of assistant. Having registered his new degree with the proper authorities, he has to serve another three years in his new post of assistant, and at the end of that time he has to study two years as pharmaceutical student in a Russian University College, and afterwards pass a very close and minute examination in the following subjects:—

Chemistry, organic and inorganic, analytical and pharmaceutical; botany, mineralogy, zoology, natural history, pharmacology, forensic medicine, and toxicology.

This examination entitles the "Subject" to the degree of "Provisor," or manager of a "Pharmacy." If a provisor writes at his examination a dissertation on some pharmaceutical subject, and is able to defend it before the Board of Examiners, he is entitled to the highest degree—that of "Magister." This degree is optional, and a "Provisor" is considered by law a pharmaceute, entitled to manage or possess a "pharmacy." In every town in Russia there is a *limited* number of "pharmacies," and a "Provisor" must take his chance in buying the privilege, or undertaking the management of one of these places. In Odessa, for instance, a town of about 100,000 inhabitants, the number of "pharmacies" is limited to eleven, which cannot be exceeded without the sanction of the medical authorities in St. Petersburg. The responsibility of a manager rests in the observance of the following duties:—

1. Keeping a stock of all drugs fixed by the Medical Board in St. Petersburg.

2. Dispensing nothing but by the prescription of a medical man.

3. Keeping books (as prescription-book, cash-book, etc.) confirmed and registered by the Medical Police.

4. Filing and keeping the original prescriptions for a period of not less than three years.

5. Charging for medicine according to the Medical Tax-Book.

6. Keeping only Patent Medicines which have been analysed and approved by the Medical Board of St. Petersburg.

Every "Pharmacy" receives once a year an unexpected visit of the members of the Committee of the Medical Police.

The Pharmaceute, as well as the medical man, is exempt from all civil duties, taxations, and enjoys many privileges.

This system works very well, and though it is perhaps impossible to introduce it into this country, *something* might be done approaching it.

After a careful reading of the pamphlet, "The Pharmaceutical Society of Great Britain," published by the Society in 1863, I come to the conviction that, with a few alterations in the system carried on by the Society, and with an additional Pharmacy Act, *authorizing the sale of drugs, or the dispensing of prescriptions by those only who have passed with efficiency the "Major Examination,"* incalculable benefit would be afforded to the public. There would be a better knowledge of the profession, and the public would have greater means of safety in a most important matter of every-day life.

Should such improvements be introduced, there is little doubt the majority of the medical profession would willingly give up the practice of selling drugs, or preparing prescriptions for their patients. And should this unjust practice not be discontinued, it might be enforced by Act of Parliament.

At all events, the time has come when the medical and pharmaceutical professions, as well as the public, see the necessity that SOMETHING MUST BE DONE ; and if it must be done, the sooner the better.—CH. W. *Manchester.*

Pharm. Jour., London, April, 1864.

NEW ALKALOID FROM THE CALABAR BEAN.

Messrs. Jobst and Hesse, of Stuttgardt, have instituted a chemical examination of the Calabar bean. They found the active principle to be contained in the cotyledons only. It was obtained by treating the beans with alcohol, and then acting by means of ether on the residue left after evaporation of the alcoholic solution. The ethereal solution after evaporation left pure *physostigmine.* Physostigmine is a brownish-yellow mass, amorphous, and in the first instance separated in the form of oily drops. It is easily soluble in ammonia, caustic and carbonated soda, ether, benzole, and alcohol; less soluble in cold water. From the ethereal solution it is entirely precipitated by animal charcoal. The watery solution has a faintly burning taste, a clearly alkaline reaction ; it gives a copious kermes-colored precipitate with biniodide of potassium, and a precipitate of hydrated oxide in solution of chloride of iron ; fused with hydrate of potash, it evolves fumes which have a strongly alkaline reaction. Acids dissolve it easily, and yield solutions of salts, which have mostly a dark red, more rarely a dark blue, color. The hydrochlorate of physostigmine yields precipitates, with tannic acid, reddish-white ; chloride of platinum, pale yellow ; chloride of gold, bluish—a reduction taking place ; bichloride of mercury, reddish-white. Twenty-one beans yielded only a little alkaloid. Two drops of a watery solution of the alkaloid placed on the eye caused the pupil to contract, after ten minutes, to about one-twentieth of its original diameter. In this condition it remained for an hour ; after from four to six hours it had again assumed its former size. Taken internally, physostigmine is as poisonous as the most dangerous cyanides. The alkaloid from one bean was given to a rabbit; five minutes afterwards it fell, remained motionless, and died twenty-five minutes later, or half an hour after the taking of the poison. Physostigmine causes contraction of the iris, even in the eye of an animal which has already been dead for some time. A rabbit's eye, treated with two drops of watery solution an hour after the animal had been killed mechanically, showed a contraction of the pupil to one-fourth of the other eye. A rabbit killed with physostigmine did not show this feature; but it was exhibited to a small degree by one which had been killed by cyanide of potassium. This shows that muscles, though dead, are yet liable to be influenced specifically, and not only by the galvanic current, but also by physostigmine.—*London Pharm. Journ., April*, 1864, from *Ann. Chem. und Pharm., Jan.*, 1864; and *British Medical Journal.*

ASAFŒTIDA IN AFFGHANISTAN.

A Supplementary Note. By M. C. Cooke.

To what was before known with certainty of Asafœtida in Affghanistan may be added the following particulars, communicated principally by Dr. Bellew, who was formerly attached to the mission to Kandahar. Some portion may be a repetition of the same facts previously obtained by other travellers, and which are hereby corroborated; for other information now communicated for the first time, Dr. Bellew is mainly responsible. This brief notice can, however, only be regarded as supplementary.

The asafœtida of commerce is obtained from only one plant in Affghanistan, viz., *Narthex asafœtida.* It grows wild on the hills about Herat and Furrah, and is never cultivated, though hundreds of the Kakar tribe from the Boree family, who collect the gum, remain in the deserts to tend and water the plant.

The "tear" sort is the gum resin that exudes, and dries drop by drop, from incisions around the top of the root; the "lump" sort is the gum resin as it exudes from a broad surface, as when the top of the root is sliced off. The latter sort is more frequently met with than the former, but I do not know of any difference in the qualities of the two sorts. There are several other umbelliferous plants in Affghanistan which resemble the asafœtida plant in external appearance, and which also, like it, when wounded, exude a milky viscid sap, but I never heard that the sap of these plants (also gum resins) was ever collected by the natives, though the plants were very abundant, especially on the western slopes and ranges of the Sufaid Koh.

The frail vaginated stem, or the lower cluster of sheathing leaves (of the asafœtida plant)—the former belonging to old plants, and the latter to young ones,—is removed at its junction with the root, round which is dug a small trench about six inches wide and as many deep. Three or four incisions are then made around the head of the root, and fresh ones are repeated at intervals of three or four days; the sap continuing to exude for a week or fortnight, according to the calibre of the root. In all cases as soon as the incisions are made, the root head is covered over with a thick bundle of dried herbs or loose stones, as a protection against the sun; where this is not done the root withers in the first day, and little or no juice exudes. The quantity of asafœtida obtained from each root varies from a few ounces to a couple of pounds weight, according to the size of the roots, some being no bigger than a carrot, whilst others attain the thickness of a man's leg. The quality of the gum differs much, and it is always adulterated on the spot by the collectors before it enters the market. The extent of adulteration varies from one-fifth to one-third, wheat or barley-flour or powdered gypsum are the usual adulterants. The best sort, however, which is obtained solely from the leaf-bud in the centre of the root-head of the newly sprouting plant, is never adulterated, and sells at a much higher price than the other kinds. The price of the pure drug at Kandahar varies from four to seven Indian rupees per "man-i-tabriz" (about 3 lb.), and of the inferior kinds from one and a half to three and a half rupees per "man." The asafœtida is commonly used by the Mahometan population of India as a condiment in several of their dishes, and especially mixed with "dal." It is not an article of general consumption in Affghanistan, though often prescribed as a warm remedy for cold diseases by the native physicians, who also use it as a vermifuge. The fresh leaves of the plant, which have the same peculiar odor as its secretion, when cooked, are commonly used as an article of diet by those near whose abode it grows; and the white inner part of the stem of the full-grown plant, which reaches the stature of a man, is considered a delicacy when roasted and flavored with salt and butter.

The annual value of the asafœtida trade with India is estimated in the Government Reports of the North West Provinces at about £2,200.—*London Pharm. Jour.*, *May* 1*st* 1864, from *The Technologist.*

ON THE PREPARATION AND PURIFICATION OF BENZOLE.

By M. E. Kopp.

I have elsewhere mentioned the snperheating process by which we have succeeded, more or less perfectly in converting the heavy tar oils, and which are frequently much charged with napthaline, into lighting gas and volatile oils rich in benzole.

The apparatus for this transformation consists of a horizontal retort of cast iron or earthenware, so arranged that it can be heated to incipient redness by the furnace flame and gases circling round it. One extremity of the retort is formed by a cover, easily adjusted and removed, giving access to the interior, and allowing of the necessary frequent cleaning out of the retort.

At a certain distance from the other well-closed extremity is a partition half the height of the retort, intended to prevent the flow of oil outside the retort.

Beyond this partition the retort communicates with a watery chamber by means of a tube placed at the most inclined part of the side.

The lower part of the water chamber communicates by a hydraulic syphon with a waste pipe placed at its extremity, serving to collect the heavy and little volatile oils which condense in this water chamber. But the upper part of the chamber is, moreover, in communication with a good refrigerator of the usual construction, into which pass the more volatile products, which there separate into light oils, which condense, and are collected apart, and into lighting gas, which flows into a gasometer. The operation is conducted in the following manner;—

The retorts (a series of which may be placed in the same furnace, and which may communicate with the same water chamber and the same refrigerator) having been heated to clear redness, a continuous thread of heavy oil is poured into them by means of a syphon attached to the exterior part of each retort, and terminating high up, with a funnel to receive the oil from a tap connected with the reservoir above.

As the oil flows into the retorts, it is rapidly affected by the high temperature, which modifies, at least, to a certain extent, its composition and its properties. The result is, more or less, graphitous or light charcoal, which remains in the retort, and more or less volatile oils and gaseous hydrocarbons.

As the volatile and gaseous products penetrate into the water chamber, a first separation is effected, then in this chamber are condensed the heavy and little altered oils, which must afterwards be again passed through the red hot retort; the more volatile products also traverse the refrigerator, where are condensed the light oils produced in the operation, which, rectified in an ordinary alembic, furnish light volatile colorless oils, rich in benzole.

For the more perfect purification of benzole (or benzine), I propose taking advantage of its property of solidifying under the influence of cold, taking the form of flakes, grouped like fern leaves, or in crystalline masses similar to camphor, melting only at 8°·5 above 0°. For this purpose we cool the rough benzine to —15° in M. Carré's refrigerator, strongly and rapidly press the benzine crystals still impregnated with other liquid hydrocarbides, and thus, with the greatest ease, we obtain crystalline benzine, which, again melted and once more submitted to the same treatment, gives us benzine almost chemically pure.

With such a benzine a pure nitro-benzine may be obtained, very useful in perfumery, and with which perfectly pure aniline may be prepared.

But we doubt whether, in the manufacture of artificial coloring matters, the preparation of chemically pure benzine, nitro-benzine, and aniline, is of so much practical importance as might have been expected; unless, indeed, we can at the same time offer to manufacturers toluol, nitrotoluol, toluidine, and homologous products, so that they can operate on mixtures giving the most advantageous results as much with respect to the beauty and richness of the color as with respect to the yield.*

After separating the benzine by congelation from light and volatile hydrocarbides, in no case must the mother liquors be mixed with the residues.

On the contrary, they must be treated as if the benzine were still present, and hence perhaps the names toluine, nitrotoluine, and commercial toluidine.

Such a separation and classification will, no doubt, facilitate the preparation and classification of anilines most suitable for various red, violet, and blue tints, and will contribute an important step to the theory of the formation of these coloring matters. —*Chem. News, London, May* 14, 1864, from *Moniteur Scientifique*, vi., 329.

BUTTER AS A REAGENT FOR COPPER AND ITS COMPOUNDS.

By E. Lancelot, Pharmaceutist, Chatillon, (Indre.)

I take the opportunity of the Scientific Commission now meeting at the Vienne (France), to communicate to my fellow-pharmaceutists a fact which, I believe, is new to the science of chemistry, and may ultimately prove highly interesting as a question of hygiene and toxicology.

Some time ago, an inhabitant of our city had a copper hydrant put up in his yard. The inner part of the copper pipe had not been tinned, that precaution being commonly deemed superfluous.

The water supplied by this hydrant for the usual wants of the household, had never been suspected of containing noxious matter; but, one day, the lady of the house told her husband that, having left a slice of butter for several days in water drawn from the new hydrant—the water having been renewed five or six times,—she found that the immersed surface of the butter had turned quite green.

Anxious to ascertain the cause of this singular alteration, the proprietor divided a pound of butter into three equal parts, and

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* See Chemical News, vol. viii., p. 4:—Dr. Hoffman's "Memoir on the necessity of Mixing Aniline and Toluidine to produce Aniline Red.'

placed them separately in three different vessels. He then filled one of these with water taken from a wooden hydrant placed in his yard at some distance from that of copper; the second vessel was filled with water from the very well that supplied the copper pipe, but, from the outside of that pipe; and the third vessel contained water that had passed through the copper pipe itself.

The butter deposited in the water of the third vessel was the only one which, after two days immersion, became covered with a bluish green color, exhibiting the aspect of an hydrate of deutoxide of copper.

This piece of colored butter was handed to me by the owner, with a request to experiment chemically upon it, so as to ascertain the true nature of this coloration.

A solution of hydro sulphuric acid applied to the butter, produced at once a blackish dirty spot; and the ferro-hydrocyanate of potassa gave a crimson spot: the latter grew darker by degrees. These characteristic aspects left no doubt of the presence of copper.

Desirous of experimenting upon the very water that had imparted such a color to the butter, and also of determining what proportion of copper it might contain, I requested the owner to send me a certain quantity of that water, especially that which would be the first drawn in the morning. He sent me about three gallons of it, one quart of which was tried by means of the above mentioned reactives, and some well-known others, but without any result.

The remaining eleven quarts were reduced by evaporation to a tumbler full. Having filtered that remnant, I tried the limpid liquor: no result. I next poured on the filter—now coated with a calcareous deposit—a few drops of a reagent: again without result. Finally, I dissolved this deposit in nitric acid, and then neutralized the solution; but that was as unsuccessful as the other trials.

Now, what conclusions can be drawn from the above? Simply this: That butter may fix and reveal molecules of copper, so very minute, that they will evade the most sensitive reagents known. Another remark is, that none of the persons who had used the water of this hydrant had ever experienced the slightest accident. Nevertheless, my experiments lead me to the following conclusion: That under certain circumstances—as, for instance, the washing of butter,—water from copper hydrants may become deleterious, unless the pipes be tinned inside.

It has long been known that the acids contained in greasy substances will act promptly on copper; but the above experiment has demonstrated to me, that butter is perhaps the most sensitive reagent to detect the presence of that metal, or of its salts, in a liquid; and that, if iron has the property of reducing the salts of copper contained in a very diluted solution, butter itself possesses the property of forming a copper salt—perhaps a butyrate—which reveals the presence of that metal, even when the active reagents most in use have failed to give traces of its existence.

I leave to the masters of the science the care of completing these experiments, which are certainly not devoid of interest in a toxicological point of view.

Translated for the Philada. Journal of Pharmacy. from L'Union Pharmaceutique, Paris.

CONVERSION OF SALT MEAT INTO FRESH; A FURTHER APPLICATION OF DIALYSIS.

By A. A. Whitelaw.

As an appendix to the notice of my process for the utilisation of brine [reprinted in this Journal, page 354,] I now beg to direct attention to a modification of that process, applicable to ships at sea, by which the quality of the meat supplied to the men may be much improved, and their food varied.

The salt meat is placed in a dialytic bag made of untanned skin, or other suitable material, and the bag filled nearly, but not quite, full of brine from the beef barrel. The dialyser is then placed in sea water, and the process allowed to go on for several days, till the meat and brine are sufficiently fresh for use, or till the brine in the dialytic bag is within 1° or 2° of Twaddel's hydrometer of the same strength of sea water. In this way, as the brine becomes free from salt, the beef, which, by the action of salt, has been contracted, gives its salt to the brine in the bag, and so the process goes on, the beef expanding like a sponge, and gradually taking up a great part of the natural juice that it had previously lost in the salting process. In this way no loss of juice is sustained by steeping, and the brine left in the bags, after a nightly dialysis in fresh water, can be used for soup.

Thoroughly salted beef, without bone, takes up nearly one-third its weight of juice, and this absorption takes place gradually as the strength of the brine in the dialyser becomes reduced.

Meat thus treated—being, in fact, fresh meat—may be cooked in a variety of ways that are obviously not available for salt meat; and so the food of sailors, and, consequently, their health, may be improved.—*Chem. News*, *May*, 28, 1864.

FRENCH CEMENT.

This cement, composed of lime and india-rubber, is very valuable for mounting large microscopical preparations. The principal advantages are—that it never becomes perfectly hard, and thus permits considerable alteration to take place in the fluid contained in the cell without the entrance of air, and it adheres very intimately to glass, even if it be perfectly smooth and unground. If a glass cover is to be affixed to a large cell containing fluid, a small piece of the cement is taken between the finger and thumb and carefully rolled round until it can be drawn out into a thread about the eighth or tenth of an inch in thickness; this is applied to the top of the cell, before introducing any fluid, and slightly pressed down with the finger previously moistened. It adheres intimately. The preservative fluid with the preparation are now introduced, and the cell filled with fluid, which indeed is allowed to rise up slightly above the walls. The glass cover, rather smaller than the external dimensions of the cell, and slightly roughened at the edges, is to be gently breathed upon, and then one edge is applied to the cement, so that it may be allowed to fall gradually upon the surface of the fluid until it completely covers the cell, and a certain quantity of the superfluous liquid is pressed out. By the aid of any pointed instrument a very little cement is removed from one part, so that more fluid may escape as the cover is pressed down gently into the cement. The pressure must be removed very gradually, or air will enter through the hole. A bubble of air entering in this manner may often be expelled again by pressure, or it may be driven out by forcing in more fluid through a very fine syringe at another part of the cell, but it is far better to prevent the entrance of air in the first instance. The edge of the glass cover being thoroughly embedded in the cement, the small hole is to be carefully plugged up by a small piece of cement, and the cell allowed to stand perfectly still for a short time, when it may be very gently wiped with a soft cloth. The edges of the cement may be smoothed by the application of a warm iron wire, and any superabundance removed with a sharp knife. A little Brunswick black or other liquid cement may be applied to the edges for the purpose of giving the whole a neater appearance. The cement is made as follows: A certain quantity of india-rubber scraps is carefully melted over a clear fire in a covered iron pot. When the mass is quite fluid, finely powdered lime, having been slacked by exposure to the air, is to be added by small quantities at a time, the mixture being well stirred. When moderately thick, it is removed from the fire and well beaten in a mortar, and moulded in the hands until of the consistence of putty. It may be colored by the addition of vermilion or other coloring matter. This cement answers well for fixing on the glass tops of large preparation jars, but if moderately strong spirit be used, a little air must be permitted to remain in the jar.—*From "How to Work with the Microscope," by Lionel S. Beale* and *Chem. News*, May 7, 1864.

COLORS OF VEGETABLES.

Prof. Rochleder states that on comparing the properties of rottlerin with those of chrysophanic acid and of purpurin, a close resemblance becomes apparent, such as generally only takes place between consecutive members of a homologous series. The formulas of these bodies ($C_{18} H_8 O_6$ for pupurin, $C_{20} H_8 O_6$ for Chrysophan, $C_{22} H_{10} O_5$ for rotterlin), likewise favor the assumption that there exists some new relation between these coloring matters. The substance which Czumpelick obtained by the treatment of aloïn with dilute acids concurs so closely in its properties with rottlerin, that there seems to exist little cause to doubt their identity. Stenhouse's formula for aloïn is perfectly in accordance with the supposition that in being split it forms rottlerin and sugar, taking up the elements of water, viz.

$$\underset{\text{aloin.}}{C_{34}H_{18}O_{14}} + 4\,HO = \underset{\text{rottlerin.}}{C_{22}H_{10}O_{6}} + \underset{\text{sugar.}}{C_{12}H_{12}O_{12}}$$

In this connection, it is of interest to notice that the purgative principle of aloes contains a substance homologous with one of the proximate principles of rhubarb.—*Drug. Circ.*, from *Sitzungsber Akad. Wien. Bd.* 47, *Ch. Central bl.* 1863.

Translated for the Journal of the Franklin Institute.

ON THE PRESERVATION OF ANIMAL MATTERS IN THE OPEN AIR.

By M. Pagliari.

I have the honor to communicate to the Academy *(of Sciences at Paris)*, a new and very simple mode of preserving animal matter. The liquor which I employ for this purpose, is composed of alum, benzoin and water, and differs but little from my *hæmostatic water*. A single coat of this preserving liquid applied upon the substance which is then exposed to the open air, is sufficient to prevent its decay.—*Journal Franklin Institute*, April, 1864, from *Comptes Rendus*.

[Pagliari's hæmostatic water is made by boiling for six hours 8 ounces of Tincture of Benzoin containing about 2 ounces of the Balsam) a pound of alum, and ten pounds of water, in a glazed earthen vessel, stirring constantly, and supplying the loss with hot water. The liquor is then strained and bottled.—Ed. Am. Jour. Pharm.]

GENUINE COLOGNE WATER.

One of the Farinas has published the following formula for this celebrated perfume, which we copy from the *Zeitschrift des Norddeutschen Apotheker-Vereins:*

℞. Benzoini (purified)	2	ounces	by weight.
Ol. Lavandulæ	4	"	
Ol. Rosmarini	2	"	

Alcoholis fortioris 9 gallons. To this solution are added successively:

Ol. Neroli,
Ol. " petits grains,
Ol. Limonis, of each 10 2-5 ounces,
Ol. Aurantii Dulcis,
Ol. Limettæ,
Ol. Bergamii, of each 20 4-5 ounces,

Tinct. Flor. geranii rosei q. s. Macerate for some weeks, then fill into flasks.

A NEW QUADRUPLE SALT.

By M. Peltzer.

By treating sulphate or acetate of copper by hyposulphite of soda there results, as is well known, a double sulphite, which has been studied by M. Lenz and M. Rammelsberg. This hyposulphite is soluble in ammonia, to which it imparts a blue color, and when left to itself the solution deposits a mass of blue crystals which constitute the new salt.

It may be obtained still more easily in the following manner: Divide into two equal parts a mixture of sulphate of copper; supersaturate one with ammonia and the other with hyposulphite of soda, and mix the two solutions; by shaking the mixture, the new product is deposited in a crystalline mass of a beautiful violet color.

The latter gives out a decided ammoniacal odor, especially if reduced to powder; it will bear a temperature of 100° C. Heated in a tube it loses no water, but forms a white sublimate which becomes orange by cooling. When boiled with water this sublimate emits ammonia, and on the addition of hydrochloric acid there follows a disengagement of sulphurous gas, which shows the sublimated product to contain M. H. Rose's sulphate—ammon.

Mixed with chlorate of potash, it denotates with some violence.

Water, especially when hot, decomposes but does not dissolve it; a green matter and white flakes of a salt of protoxide of copper are formed, and ammonia is disengaged; by prolonged boiling sulphide of copper is formed.

The new salt is soluble in ammonia, hyposulphite of soda, and acetic acid. Heated with potash it deposits at the boiling point a mixture formed of protoxide and deutoxide of copper.

The solar rays decompose the acetic solution, hypochlorite of soda also destroys it, forming a white precipitate containing protoxide of copper and tetrathionic acid.

Nitrate of silver produces a white precipitate; the precipitate. however, soon disappears to give place to a green deposit soluble in ammonia, but easily giving a deposit of sulphide of silver. The deposit contains copper, silver, and hyposulphurous acid. The author is of opinion that iron, zinc, and silver may be substituted for copper; besides, ferruginous sulphate of copper gives a quadruple salt containing iron.

The author has found for the percentage composition of this salt—

Cu_3O_2 . . .	27·76
NaO	15 52
NH_3	8 52
S_2O_2	48·19

thence he deduces the formula—

$$S_2O_2Cu_2O,S_2O_2CuO+(S_2O_2NaO)+2AzH_3{}^*.$$

According to him ammonia here plays only a passive part, acting in the same way as water of crystallization.—*Chemical News, London, June 4*, 1864, from *Journal de Pharmacie et de Chemie.*

TO BLEACH GUTTA PERCHA.

Dissolve gutta percha (one part) in 20 parts of hot benzole, shake the solution with one-tenth part of freshly calcined

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* This empirical formula may be decomposed into—

$$S_2O_2Cu_2O.S_2O_2NaO+S_2O_2CuO,S_2O_2NaO+2AzH_4.$$

which gives a quadruple salt differing from those already known only in containing three different bases and one acid.

plaster, and set aside, with occasional agitation, for two days. The clear pale brownish-yellow liquid is then decanted into another vessel containing double its bulk of alcohol fortius, when the gutta will be precipitated in the form of a brilliantly white tenacious mass, which is pounded together in a mortar, and rolled into cylindrical sticks.—*American Druggists' Circular.*

Varieties.

Mummy Wheat.—The 'Presse Scientifique des Deux Mondes' contains a description of a series of experiments made in Egypt by Figari-Bey on the wheat found in the ancient sepulchres of that country. A long dispute occurred a few years ago, as to what truth their might be in the popular belief, according to which this ancient wheat will not only germinate after the lapse of three thousand years, but produce ears of extraordinary size and beauty. The question is undecided; but Figari-Bey's paper, addressed to the Egyptian Institute at Alexandria, contains some facts which appear much in favor of a negative solution. One kind of wheat which Figari-Bey employed for his experiments had been found in Upper Egypt, at the bottom of a tomb at Medinet-Aboo, by M. Schnepp, secretary to the Egyptian Institute. There were two varieties of it, both pertaining to those still cultivated in Egypt. The form of the grains had not changed; but their color, both without and within, had become reddish, as if they had been exposed to smoke. The specific weight was also the same, viz., twenty five grains to a gramme. On being ground they yield a good deal of flour, but are harder than common wheat, and not very friable; the color of the flour is somewhat lighter than that of the outer envelope. Its taste is bitter and bituminous; and when thrown into the fire, it emits a slight but pungent smell. On being sown in moist ground, under the usual pressure of the atmosphere, and at a temperature of 25° (Réaumer), the grains became soft, and swelled a little during the first four days; on the seventh day their tumefaction became more apparent, with an appearance of maceration and decomposition; and on the ninth day this decomposition was complete. No trace of germination could be discovered during all this time. Figari-Bey obtained similar negative results from grains of wheat found in other sepulchres, and also on barley proceeding from the same source; so that there is every reason to believe that the ears hitherto ostensibly obtained from mummy wheat proceed from grain accidentally contained in the mould into which the former was sown.—*Veterinarian, March,* 1863.

Formation of Cell wall.—Vegetable histology has attracted of late years considerable notice. Herr Schacht has been examining into the formation of the primordial utricle, with a view to discover what light they might throw upon the formation of the cell-wall. At an early stage in the development of the embryo, numerous currents were observed in the protoplasm, and afterwards a net-work of threads of cellulose, corresponding to these currents, are found, resulting from the gradual change of the protoplasm itself; these continue to increase in thickness. This formation is considered analogous to that of the outer layer of the primordial utricle from the inner layer of the same: the various modifications are also explained by the supposition of the existence of currents. The gradual formation of cellulose threads in this matter is considered conclusive against the theory that the cellulose wall is a secretion of the primordial utricle.—*Lond. Chem. News*, April 9, 1864.

Preservation of Wood.—The following composition is recommended to protect the bottom of posts, palings, and tubs set in the earth:—Forty parts of chalk are added to fifty parts of resin and four parts of linseed oil, melted together in an iron pot. One part of native oxide of copper is then added, and one part of sulphuric acid is cautiously stirred in. The mixture is applied hot with a strong brush, and forms, when dry, a varnish as hard as stone.—*Lond. Chem. News*, April 9, 1864, from *Neues Jahrb. fur Pharm.*, bd. xx., s. 235.

New Method of Coloring Woods.—The surface to be colored is smeared with a strong solution of permanganate of potash, which is left on a longer or shorter time, according to the shade required. In most cases five minutes suffice. Cherry and pear-tree woods are most easily attacked, but a few experiments will serve to show the most favorable circumstances. The woody fibre decomposes the permanganate, precipitating protoxide of manganese, which is fixed in the fibre by the potash simultaneously set free. When the action is ended, the wood is carefully washed, dried, and afterwards oiled and polished in the ordinary way. The effect of this treatment on many woods is said to be surprising, particularly on cherry wood, to which a very beautiful reddish tone is communicated. The color is in all cases permanent in light and air.—*Lond. Chem. News*, April 23, 1864, from *Dr. Wiederhold, Neues Gewerb. fur Kurhessen*, 1863, s. 194.

Black Dye for Kid Gloves.—Dissolve ten kil. of red chromate of potash in a sufficient quantity of hot water, and gradually add potash until the liquid no longer reddens litmus; then spread with a sponge, as a dye, this solution of chromate of potash on the skin. Besides this, there should be prepared, in a copper cauldron, a dye composed of one kil. of rasped fustic, ·75° kil. of fustic, one kil. of ground logwood, and three pailsful of water; after being clarified this should be briskly boiled till there remains only two pailsful of liquid, the rest being evaporated or absorbed by the wood. This dye is applied to the skin somewhat dried and mordanted with chromate of potash. The skin should be spread out on a table and left till it attains the proper medium of dryness. It is then coated with a solution of one kil. of Marseilles soap, thick enough to form a kind of jelly, with which is mixed ·75° kil. of very pure colza oil, which should be so well incorporated as to have no drop of oil visible. This soap jelly frees the dyed skin from all humidity, and renders it supple, soft, and lustrous.—*Lond. Chem. News*, April 23, 1864, from *Moniteur Scientifique*, v. 847.

Editorial Department.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, at Cincinnati. —By reference to the Almanac, it will be found that the third Wednesday in September is the 21st of that month, which is as late as it could happen, and three months from the time of this writing. Will not the members of the Association endeavor to make their arrangements so as to attend this meeting, and make it one of the largest and best we have had? All of us need some recreation, and many can afford the time and means to go as far as Cincinnati and shake hands with many brethren from the west, north west, and south west, for we trust there are many in Kentucky and Missouri who will make some endeavors to get to the meeting. Of the thirty seven queries to be answered at that meeting, only two have been taken by members west of the Alleghanies. This leaves a large margin for our Western friends to bring in volunteer papers; and as the interest of these meetings is greatly enhanced by the introduction of subjects inviting discussion, we hope they will bring forward topics interesting to us all, such as the grape culture in its relation to medicine in wine and tartar: the alcohol manufacture as an item of western production; the trade in indigenous drugs, and the sources for the supply of commerce, etc. We believe it is time the Association gave some attention to the statistics of Pharmacy, and it may well be thought of to take the subject in hand in relation to practitioners and assistants, druggists and apothecaries; the production and consumption of chemical drugs and medicines. Let us all set our faces in the direction of Cincinnati, and by a little extra exertion and management arrange our affairs so as to be in the Queen City of the West on the 21st of September, 1864.

SOME PECULIARITIES OF THE BRITISH PHARMACOPŒIA.—In our last number we noticed some points in this new work, and now propose to refer succinctly to some other preparations:—

Ammoniæ Benzoas made by direct combination with three fluidounces of solution of ammonia, two ounces of Benzoic acid, and eight fluidounces of distilled water. Evaporate and crystallize.

Ammoniæ Phosphas is directed to be made by saturating diluted phosphoric acid with solution of ammonia! Why so expensive a process should have been chosen we cannot divine. The usual process in this country is, to saturate super phosphate of lime obtained from bone ash, by the action of oil of vitriol, as in the process for phosphate of soda, with carbonate of ammonia (see page 10, vol. xviii. of this Journal). The same process is in the British Pharmacopœia for phosphate of soda.

Antimonium Sulphuratum is made with liquor sodæ in place of liquor potassæ.

Atropia is made by the process of Mein, so far as the precipitation with carbonate of potassa, when the alkaloid is extracted by agitating the alkaline mixture with chloroform. The impure atropia obtained by evaporating the chloroform is purified by solution in spirit, digestion with animal charcoal, evaporating and crystallizing.

Argenti oxidum is prepared with lime water instead of potassa, seventy fluidounces to decompose half an ounce of nitrate of silver.

Beberiæ sulphas is made from Beberu bark, by a process analogous to that of sulphate of quinia, except that the product being uncrystallizable and extract like, is obtained in scales, by evaporation on glass plates.

Digitalinum. M. Henry's process is given for this substance.

Emp. Saponis is made by the following process:—Six ounces of powdered white Castile soap, one ounce of powdered resin, and thirty-six ounces of lead plaster are used. The first two ingredients are liquified (by heat?) and added to the plaster, previously melted; then, constantly stirring, evaporate to the proper consistence. Now, if heat alone is used to liquify the soap and resin, what is there to evaporate? If it is intended to add water, why is it not stated? This is certainly a defect in the process, except to adepts familiar with the preparation of this plaster.

Extracts.—A marked contrast between the manner of making these preparations in our own and the British Pharmacopœia, is apparent in the slight use of alcohol and of the process of percolation. *Extract of Chamomile* is made with water, adding fifteen minims of the volatile oil for a pound of the flowers, at the end of the process! *Extract of Columbo* is made by percolation with proof spirit. *Liquid Extract of Yellow Bark* is made by maceration and percolation with fifteen pints of water to one pound of bark, evaporated to three fluidounces, to which one ounce of alcohol is added for preservation.

Liquid Extract of Ergot is made by treating the ergot by percolation with the ether, after agitating it with water, to remove the fixed oil, and then exhausting the residue with water, by digestion, at 160° F., heating the liquor to 212°, straining out the coagulum, and evaporating the liquor to nine fluidounces, and add eight fluidounces of alcohol, and filter. Our own process is greatly superior to this, and more ready of execution. *Liquid Extract of Opium* is a solution of an ounce of extract of opium in seventeen ounces of water, preserved by the addition of three ounces of alcohol. *Liquid Extract of Pareira* is made with water, an ounce to a fluidounce in strength, and preserved with three fluidounces of alcohol to the pint. Fluid Extract of Sarsaparilla is made in the same way.

Connected with the subject of extracts we offer a few remarks on—

Percolation in Great Britain.—Since the publication of the British Pharmacopœia, the pharmaceutists have suddenly awoke to the importance of this process of solution. Did we not remember how it was in this country, about twenty years ago, when the Pharmacopœia of 1840 was published, we might almost smile at some of the remarks that are made about this now established process. In the British Pharmacopœia it has been introduced in the preparation of tinctures, but in such an imperfect manner as to detract considerably from its merit. In most of the cases the following manipulation is directed:—

"*Tinctura Aconiti. Tincture of Aconite.*

Take of Aconite root, in fine powder, two ounces and a half,

Rectified spirit a pint (twenty fluidounces),

Macerate the aconite root, for forty-eight hours, with fifteen ounces of the spirit, in a close vessel, agitating occasionally; then transfer to a percolator, and, when the fluid ceases to pass, pour into the percolator the remaining five ounces of the spirit. As soon as the percolation is completed, subject the contents of the percolator to pressure, filter the product, mix the liquids, and add sufficient rectified spirit to make one pint."

The menstruum varies with the substance and the proportion of ingredients, but the state of division is sometimes in fine powder, sometimes "cut and bruised," and often in coarse powder. The previous maceration and the use of the press, to get the portion of tincture absorbed, show either a lack of confidence in the process, or aims at saving the menstruum; nor has the process been adopted in many preparations, except the tinctures.

Since the publication of the Pharmacopœia, Mr. Haselden, Mr. Sanger, Mr. Deane and Prof. Redwood have written on the subject, various apparatus figured in the Pharmaceutical Journal, and Prof. Redwood, while stating the merits of percolation, evidently gives what he calls "the automatic process," (the method known here as circulatory displacement, and which originated with Mr. Alsop's Infusion mug in 1832, and afterwards employed for tinctures by Dr. Burton, of England, and known there as Burton's method), the preference. Now, the difference between maceration at the top and bottom of the liquid is a very important one. We entirely agree with Prof. Redwood as to the value of this method compared with ordinary maceration, but, when compared with percolation, it is far inferior, both as regards economy of time and readiness of execution, when the trouble of using the press and filter are kept in view. The great points in the process of percolation are familiarity with the proper fineness of powders, firmness of packing, and in proceeding at once, without maceration. The powders are more thoroughly exhausted, and there is less waste of the active matter of the drugs than by any other means. As regards the waste of menstruum at the last, it need not be, as the absorbed alcohol may be in great measure displaced by water, and the impure liquid thus obtained, mixed with other residues for precipitation, when they accumulate sufficiently. There are substances which will not admit of this percolation by water, where glutinous matter is present in quantity, but, where a conical percolator or a funnel is used, this objection, except in a few instances, is overcome. Until the recent war tax on alcohol has raised its price so greatly, the saving of the absorbed menstruum was not important, but now, economy in alcohol is as important to us as to our English brethren. The greatest defect in the mode of employing percolation in the British Pharmacopœia is the previous maceration in three-fourths of the menstruum. In our Pharmacopœia, the slight moistening of the powders is intended to favor the descent of the liquid by inviting it from particle to particle as well as to render packing more easy. When a liquid is poured upon a dry powder the enclosed air often opposes its descent, more especially if the liquid is aqueous. In concluding this notice, for the present, we cannot but admire the earnestness with which the English pharmaceutists have taken hold of their Pharmacopœia, and speak out their views in regard to its imperfections. This honest criticism will do more to correct these faults and substitute better processes than any other means, and will, we hope, result in the next edition being the work of a joint commission of physicians and pharmaceutical chemists. The great point is now gained; having but one national Codex—on this as a basis, they may erect, by future revision, a work that will compare favorably with that of any country, whether viewed in relation to the comprehensive scope of its Materia Medica, the scientific construction of its formulæ, or the elegance and efficiency of its preparations.

Prospectus of the Forty-fourth Course of Instruction in the Philadelphia College of Pharmacy, to commence October, 1864, *preceded by an Historical Sketch of the School.* Philad., 1864, pp. 10.

We are reminded by this pamphlet of the approach of the lecture season, and take this means of suggesting that all those of our readers or their friends, who may desire to attend a course of instruction in this College, or who may wish information about it, can have a copy sent to them by addressing a note to the Editor of this Journal, stating the address to which it is to be sent. A complete Catalogue of the Graduates, from the beginning of the School to the present time, is appended. Our readers are also referred to the advertising sheet of this number for information on the same subject.

New York Medical Independent is the name of a new weekly medical Journal, commencing May 4, 1864,—16 pages in each number, issuing in our sister city. The special Editor is not announced, but the Editorial labors are referred to "The New York Medical Literary Association," and it is published by T. B. Harrison & Co., 447 Broome Street, New York. It claims to have a "Pharmaceutical department" under the charge of a competent Editor. We like to see a tangible Editor or Editors to a journal, yet it does not necessarily follow that anonymous labor is not well done. As regards the Pharmaceutical department, there is ample room for its active employment, and we hope to see it teem with valuable hints and comments on legitimate pharmaceutical topics.

The Union Monthly and Journal of Health and Education, devoted to the Union of the Nation, National Education, and the Temporal and Spiritual welfare of the Army, Wm. M. Cornell, M.D. L.L.D., Editor. Philad. 18 4, pp. 24.

Two numbers of the above journal have been received; it appears to be more political than medical in its character.

OBITUARY.

Heinrich Rose, the illustrious chemist, died at Berlin, on the 28th of January, at the age of 69 years, having filled the chair of Chemistry in the University of Berlin for more than forty years. He was a pupil of Berzelius, at Stockholm, in 1819. His treatise on Analytical Chemistry has been translated into French and English, and for a long time was almost our sole authority. *Poggendorff's Annalen* contained nearly all his papers, and scarcely a volume of that important journal for forty years past is without contributions from his pen. Rose was in private life one of the most gentle and excellent of men. Thus in two months has the University of Berlin lost two of her most illustrious men, Mitscherlich and H. Rose.—*Silliman's Journal.*

THE

AMERICAN JOURNAL OF PHARMACY.

SEPTEMBER, 1864.

PERMANGANATE OF POTASSA.

By Edward R. Squibb, M. D., of Brooklyn, N. Y.

During the past few years Permanganate of Potassa has been steadily acquiring importance as a therapeutic agent, and the number of its useful applications has so extended as to gain for it admission into both our own and the British Pharmacopœia.

Since May, 1863, however, it has acquired a new importance, from its application to the treatment of Hospital Gangrene; and, within the past four months, the demand for it by the Government for the Army Hospitals, could not be supplied, although application has been made to most, if not to all the prominent manufacturing chemists of the country.

Prof. Samuel Jackson, of Philadelphia, (see *Amer. Journ. Med. Sciences*, for January, 1864, p. 98, *et. seq.*,) in search for new applications for this salt, suggested its use in gangrenous wounds, to his friend, Dr. F. Hinkle, formerly of Marietta, Pa., but then an Acting Assistant Surgeon in the army, on duty at the Campbell General Hospital, Washington. Dr. Hinkle adopted the suggestion, and first applied it to the treatment of Hospital Gangrene, in May, 1863, with success. Subsequently he extended its application to the same disease in the Jarvis General Hospital, Baltimore, under charge of Surgeon De Witt C. Peters, U. S. A., and published the results in the *Amer. Med. Times*, Vol. VII., Nos. XXII and XXIII., pp. 254 and 265. The results obtained in this hospital are endorsed by Surgeon Peters, in a letter to the editor of the *Amer. Med. Times*, Vol. VII., No. XXIII., p. 266, and were deemed of sufficient importance to authorize its extended application in the Army Hospitals, by the Surgeon General, hence the demand, which as yet, has not been fully supplied.

The reason for this deficiency in supply is, probably, the troublesome, laborious, wasteful, uncertain and expensive processes which have been published and adopted for producing it. The U. S. Pharmacopœia places the salt in the Primary List of the Materia Medica, to be obtained from the manufacturing chemist, giving no process for it. The British Pharmacopœia gives a bad modification of the process of Gregory, which yields it in very small proportion, liable to contamination with sulphate of potassa, chloride of potassium and free potassa, and by a very troublesome and tedious manipulation. The best published process is, probably, that of M. Béchamp, of Montpellier, France, which is an improvement upon the original method of MM. L'Hermite and Personne. It is briefly, as follows:—Ten parts of binoxide of manganese in fine powder, and twelve parts of fused hydrate of potassa dissolved in a small quantity of water, are intimately mixed, and then thoroughly dried. This mixture is placed in an earthen-ware retort, the tubulure of which is furnished with a tube, which passes to near the bottom of the retort. To the beak of the retort, when placed in a furnace, a bent tube is adapted and the end of this dips into mercury. The retort is heated, and then a current of oxygen, or air deprived of carbonic acid, is passed into it through the tube in the tubulure until absorption ceases. The mass is then exhausted with hot water, and through this solution carbonic acid is passed, until the solution acquires the proper red or purple color, when it is allowed to settle. It is then decanted and concentrated, without boiling, until crystals begin to form. The crystals which separate on cooling are recrystallized. The product is about 35 per cent. of the weight of oxide used. The peculiarities of this method, which is not so well known as that of Gregory, are first, that oxygen obtained in a separate process, is passed through the heated mixture of binoxide of manganese and hydrate of potassa, until it ceases to be absorbed; and second, the saturation of the free potassa, which must be used in excess, by carbonic acid. This method, well managed, gives a very large yield of a very pure salt; but it is extremely complicated, troublesome and expensive, and only available upon a very small scale, or a scale so very large as to admit of an expensive special apparatus.

The process of Gregory sometimes unaccountably fails altogether, even with excellent binoxide of manganese; and, at best, yields a small product, from the difficulty of separating the chloride of potassium from the final solution. It is as follows:—Eight parts of binoxide of manganese and seven parts of chlorate of potassa are powdered together, and mixed with a solution of ten parts of hydrate of potassa in a very small quantity of water. This mixture is dried, heated, and rubbed to powder, and then ignited in a crucible, until the chlorate of potassa is thoroughly decomposed. The mass is then boiled in a large quantity of water, and allowed to settle. The clear solution is then decanted, and evaporated until it will crystallize on cooling. The crystals are redissolved and recrystallized. The oxidation is here obtained from the chlorate of potassa, but the resulting chloride of potassium remains to crystallize from the solution with the permanganate. The British Pharmacopœia modifies this process, and saturates the free potassa with sulphuric acid, thus complicating the process, and yielding sulphate of potassa.

These processes alone, so far as the writer knows, have been relied upon by manufacturing chemists generally, and their uncertainty and insufficiency have been the cause of much trouble and delay, and of an inadequate supply, through which suffering may have been prolonged and, possibly, lives lost.

Under these circumstances, the writer, two months ago, determined to devote his time and attention, as far as possible, to some efforts at improving a process for the preparation, and believes he has succeeded sufficiently to warrant the publication of his results, though they have not, as yet, been practically applied on any larger scale than that now to be described; and it is hoped that other manufacturers will take up the method, and improve it to their own interests and those of humanity.

An experience of some years in preparing this salt on a small scale, had led the writer to conclude that the laws of combining proportions were not to be relied upon in the formation of the salt, and that the trials with it must be mainly empirical.

This rendered the subject a tedious and laborious one, and naturally detracts somewhat from that confidence which the results might otherwise claim, since these now are strictly applicable only to the particular parcel or lot of binoxide of manganese used in the experiments.

Besides the experience of some years just alluded to, the basis of these experiments and researches was, first, the fact recorded by Chevillot and Edwards, that binoxide of manganese ignited with hydrate of potassa, produced *some* manganate of potassa ; second, that sesquioxide of manganese, reduced from binoxide at a red heat, was again converted into binoxide, if subjected to the action of steam at a temperature somewhat below redness ; and third, that the formation of other crystallizable salts in the solution of the permanganate must be avoided.

It was first ascertained by experiment that an intimate mixture of binoxide of manganese and hydrate of potassa, gave a larger proportion of manganate of potassa, when heated only to a temperature very much below redness, than when ignited ; and it was next ascertained that the application of steam to the mixture, when thus moderately heated, increased the proportion both of manganate and permanganate ; and the prime object then became, to push this oxidizing process as far as possible, and to simplify its application. It was next found that repeated applications of steam, more than prolonged application, favored the desired result, and this, and a desire to simplify, led directly to the intermittent application of water to the heated mass, instead of steam, and the result was found to be better and far more easily obtained. Béchamp had avoided crystallizable salts by supplying oxygen to the mixture from without, provided his process was so managed that the carbonic acid was not in sufficient quantity to produce any bicarbonate ; but it seemed better and more simple, as well as more economical, to separate the excess of potassa without combining it, and then to reserve it for farther use.

This brief outline of the expenditure of much time, labor, and trouble, may serve to introduce the process proposed, as modified by these results, and as practised many times upon the scale given, with tolerably uniform results.

The binoxide of manganese used was imported from Saxony, or known in the market as Saxony Manganese, and contained 71·63 per cent. of pure binoxide, by Fresenius and Will's method of assay. The hydrate of potassa used was the common caustic potassa of commerce, sometimes in sticks, and sometimes simply fused in lumps.

Take of Binoxide of Manganese, containing not less than 70 per cent of the oxide, and in fine powder, six pounds, avoirdupois.

Fused Hydrate of Potassa, four pounds.

Distilled Water, a sufficient quantity.

Put two pounds of the potassa, and four fluid ounces of distilled water into a shallow cast iron basin of two gallons capacity, and place this over a furnace-fire sufficiently brisk to heat the bottom of the basin nearly red hot. When the potassa is dissolved, add to the solution two pounds of the binoxide of manganese and stir the mixture constantly until it is dry. Then rub it to powder in the basin with an iron pestle, and heat it thoroughly, but short of redness. While hot, pour upon it in a small stream a pint of distilled water, and so manage this that the whole of the powder may be moistened as quickly as possible. Stir the mixture thoroughly and constantly until it is again dry, and then occasionally until it is again heated as before. Then asperse it again with a pint and a half of distilled water, and stir and heat the mixture as before. Repeat this heating and aspersion with one and a half pints of distilled water again twice, making four times in all, and then having heated the mixture, add one and a half gallons of distilled water, and heat to brisk ebullition with stirring. Remove the basin from the fire, allow it to settle during ten minutes, and then very carefully pour off the clear solution from the sediment. Replace the basin with the sediment on the fire, and having added one gallon of distilled water, again heat to boiling, remove from the fire, settle and decant as before. Repeat the boiling and decantion again with half a gallon of distilled water, and then throw away the residue. Stir the mixed solution obtained, and allow it to settle for half an hour. Then return the clear portion to the cleaned iron basin replaced over the fire, and evaporate the whole to about two or three pints, avoiding too much heat toward the close of the evaporation.

Then set it aside over night to cool and crystallize. Put the whole into a funnel, the lower part of which is obstructed by broken glass, and allow the solution to drain off from the crystals. Return this solution to the basin, placed over the fire as at first, and having added to it one pound of the potassa, evaporate the mixture until it begins to froth and thicken; then add to it two pounds of the binoxide of manganese, and repeat the entire process as with the first two pounds; and, finally, proceed in precisely the same manner with the remaining two pounds of the binoxide. (And, should the making be continued farther, the proportion of potassa may be reduced to half a pound for each two pounds of the binoxide.) Displace the mother liquid contained in the accumulated crystals in the funnel, with distilled water, and dissolve the crystals in about six pints of boiling distilled water; allow the solution to settle for half an hour, and then pour the clear portion off for crystallization. After twenty-four hours' standing, drain the crystals in a funnel, wash them with a fluid-ounce of cold distilled water, and dry them on a delf plate at ordinary temperatures, protected from dust and laboratory vapors. Finally, concentrate the mother liquors, and obtain one more crop of crystals, to be treated as the first, and then add the remaining mother liquor to that first separated from the crude crystals, to be reserved with it for the next making, where it may be taken to represent one and a half pounds of potassa. The yield of finished crystals under good management will be 20 to 25 per cent. of the weight of the oxide used, but under ordinary management will not be over 16 to 18 per cent.

The residuary oxide of manganese directed to be thrown away, when assayed by the method of Fresenius and Will, gives about 60 per cent. of the binoxide, and therefore may be reserved for making chlorine, or possibly to be used over again in this process.

Half of the above quantities in a basin half the size indicated, have been repeatedly used over a good gas flame, but the yield is not proportionally as good, while the time and labor is about the same.

In drying the mixture of binoxide and potassa in the first step of the process, if the solution of potassa be not evaporated to a very small quantity, the addition of the binoxide causes troublesome spitting, and the little drops thrown out are liable to burn the hands and face of the operator, or fly in his eyes. The aspersion with water requires care and skill to get the whole mass quickly moistened with the least possible loss by the explosive flying off of the finer particles. There is always much loss from this cause, and the portion lost is the most soluble and valuable portion of the whole. When finally heated ready for dissolving out the soluble portion, the whole mass weighs within 100 grains of three pounds, whilst the sum of the weights of the binoxide and potassa would give four pounds. This loss is doubtless in great part water from the potassa, but cannot all be accounted for in this way, even when the loss by dust is added. In dissolving out the salt from the insoluble residue, long boiling should be avoided, because any lower oxides of manganese that may have been formed would be oxidized at the expense of the permanganate. The insoluble residue should not be washed farther than is indicated in the process, because the quantity remaining in the residue is insignificant, and does not repay the loss from additional evaporation. The exhausted residue weighs a few grains less than twenty-eight ounces. Then as the two pounds of binoxide contained about 71 per cent., or nearly twenty-three ounces of pure binoxide, the loss of four ounces of this would be a little over one-sixth, or between 16 and 17 per cent., and this quantity would represent about seven ounces of permanganate of potassa, and would indicate about 950 grains as the quantity of potassa really utilized or combined in the process, all the remainder being excess; and, in practice, without such excess, the product is very small. This is a curious and unaccountable feature in the process. The calculated yield of seven ounces of permanganate is, however, never realized, but oftener four or four and a half ounces. What it might be upon a larger scale is as yet undetermined, but the probability is that it would not be better. It would doubtless increase a little by accumulation as the process was continued, since the mother liquor, being continually passed on, would carry a portion of the salt with it. In making the process a continuous one, the proportion of potassa would finally be reduced to about three or four ounces to the two pounds of the binoxide, thus economizing the expense for material. Then, if the residuary binoxide could be powdered and used over again, the expense would be still farther reduced. The principal items of cost, however, are the skill time and labor.

The evaporation of the clear solution should be conducted with care or by steam heat, particularly toward the close, as too much heat then, appears to decompose a portion of the salt, with the evolution of gas—probably oxygen. If the evaporation be carried beyond the point indicated there is much loss. Whilst, if it stop short of that, an unnecessary proportion of the salt is carried on in the mother liquor to the next portion made. The treatment of the crude crystals and their purification by recrystallization is simple enough and needs no comment. The crystals are usually obtained in fine slender needles, and are purest when small, because then the washing is more effectual in freeing them from potassa. These crystals in drying always undergo a slight amount of decomposition from the organic matter in the atmosphere, and consequently, they always give a slight deposit of hydrated binoxide of manganese upon being dissolved. The amount however is practically insignificant when the salt has been carefully prepared. The presence of caustic potassa and chloride of potassium frequently present, is a much more serious objection to the salt containing them because both are active irritants. The salt should always be well crystallized and dry, and should stand the sulphate of iron test.

How the oxidation is accomplished in the above given process,—or rather whence the oxygen is obtained, the writer cannot tell. At first it was supposed to be by decomposition of the water of aspersion, but afterwards it was thought more probable that it came from the air, and that the agency of the water was merely that its vapor or steam displaced the nitrogen left in the interstices of the powder after the oxygen of the air had been absorbed, and then as this steam was driven off, it gave place to fresh supplies of air for the oxidation. The powder before aspersion is greenish black, and gradually changes with each aspersion to a rich deep chocolate or purplish brown color, and the same quantity of water moistens it more and more each time it is applied as the solubility increases.

The supposed advantages of this process over those hitherto published are mainly, simplicity and economy of material, apparatus and labor. It entirely dispenses with the use of the most expensive material, namely chlorate of potassa,—avoids the crucible operations and the high heat, which are always difficult and troublesome,—avoids the use of acids, and at the same time greatly economizes the potassa; and, finally, avoids the risk of crystallizable contaminating salts.

Among its prominent disadvantages are its slowness and the smallness of the per diem yield, since one man could probably make but two portions of, say four pounds each, upon one fire in a day, and could scarcely attend well to more than two fires. Another disadvantage will be the difficulty of teaching ordinary assistants to manage the aspersions properly, without special apparatus.

Brooklyn, August 20th, 1864.

REMARKS ON THE PREPARATIONS OF THE U. S. PHARMACOPŒIA, 1860.

By William Procter, Jr.

(*Continued from page* 306.)

In continuing the remarks on the Pharmacopœia, the subject next in order is that of the solid extracts. The changes made in the revision of these formulæ consist in altered names, modified preparations and manipulation, and new preparations. The present number is 32, against 28 in the old edition; of these eight are new preparations, four of the old ones being dismissed.

Extractum Aconiti Alcoholicum.—Extract of Aconite Leaves from the expressed juice has been dismissed, and the formula for the alcoholic extract of the leaves retained in a form modified by the use first of alcohol, and then of diluted alcohol; a pint of the former for each 12 troy-ounces of the leaves; percolating a pint of tincture by adding diluted alcohol, and concentrating this by spontaneous evaporation to a syrupy consistence to be mixed with the product of the evaporation of the liquors obtained by continuing the percolation with diluted alcohol. The new process limits the temperature to 160° Fahr., which, if literally followed, will sacrifice all the menstruum. In the same manner it is directed to prepare the alcoholic extracts of conium, digitalis, stramonium, helleborus and valerian, the two last from the roots and the former from the leaves.

Since the publication of the Pharmacopœia, the extraordinary rise in the price of alcohol, due to the revenue tax on whisky, renders the literal observance of this formula for these extracts highly expensive, as for each 12 troy-ounces of material 2½ pints, or about one dollar's worth of alcohol, is lost in obtaining about four ounces of extract. It is believed that by careful and slow distillation with a water bath heat the alcohol of the second liquid may be regained, or if a vaccuum evaporator can be used the whole may be separated. This points to the importance of such an apparatus being at command, and it is to be hoped the attention of some pharmaceutical engineer will be directed to getting up an arrangement sufficiently cheap to be within the reach of an apothecary who desires to prepare his own extracts. We presume, with a strongly made gallon still, a common exhausting syringe might reduce the temperature of ebullition sufficiently low to save the alcohol and avoid injury to these preparations, provided the joints could be rendered sufficiently tight in an economical manner.

The alcoholic extracts of belladonna and hyoscyamus are directed to be made from the powdered leaves by means of a menstruum two-thirds alcohol and one-third water, instead of equal parts as before, and the evaporation being limited to a water bath heat admits of distillation to recover the alcohol.

There seems to be no good reason why stramonium leaves should be treated differently from belladonna leaves, being no more susceptible to injury by heat; yet we find the alcoholic extract of stramonium ranged with aconite, digitalis and conium, in relation to the avoidance of temperature.

The inspissated juices of belladonna, conium, hyoscyamus and stramonium are prepared as in the old edition.

Extractum Arnicæ Alcoholicum is a new preparation, solely intended as a means of making the *Plaster of Arnica.* It is made by distilling the alcohol, by means of a water bath heat, from a tincture of arnica made by percolation with two parts alcohol to one of water. By careful manipulation three-fourths of the alcohol used in this formula may be recovered.

Extractum Cannabis Purificatum.—It is presumable that the commercial extract of Indian Hemp is made by processes variable in their details, as it is found to differ materially at one time and another, both as regards its medicinal activity and the proportion of matter insoluble in alcohol in the extract. Whence comes this brown residue in the commercial extract? We find the best reason for its presence in the manner of making on a large scale. The hemp is put in a still, rectified spirit (alcohol U. S. P.) is poured on, and the heat applied until the drug is well decocted, probably decanting the first hot liquors, adding more spirit, and again decocting. During this process the alcoholic strength of the menstruum is altered by the volatilization of a part of the alcohol, and consequently other matter beside the resin, of an extractive nature, is taken up and remains in the final product on distilling off the alcohol from the tinctures. The only other way to account for its presence is designedly using diluted alcohol at the end of the process with the intention of getting a larger product.

The London process for extract of Indian hemp directs it to be made by macerating powdered Indian hemp in five parts of rectified spirit without heat, pressing and evaporating in a still to the state of an extract. It is very probable that this extract will dissolve without appreciable residue.

The U. S. Pharmacopœia of 1860 directs nearly equal parts of the commercial extract of Indian hemp and alcohol to be rubbed together until they are mixed, six parts more of alcohol added and mixed, and then, after standing 24 hours, filtered, and evaporated at 160° to dryness. When equal parts are rubbed together a thick syrupy solution of the soluble portion of the extract is effected, with which, by continued malaxation, the insoluble portion will form a semifluid mixture, but as soon as the remainder of the alcohol is added the brown extractive, not being soluble in the alcohol, precipitates, in a consistent state, owing to the abstraction from it of a part of its moisture by the alcohol. After 24 hours maceration the tincture is filtered, the dregs washed with alcohol, and the liquid evaporated. The probability is that nearly all the extract of hemp used in dispensing is the commercial. We have not seen a prescription for the purified extract as yet; hence the inference is that this preparation is mainly intended for the preparation of the tincture. If this be true it were better to have included it in the recipe for the tincture. I am not aware that any experiments have been made to ascertain whether the matter insoluble in alcohol has any activity, but presume that it has not, and to this extent the commercial extract is deficient in power, yet there is great reason to believe that all the merely resinous matter of the commercial extracts is not true *cannabin*, else there could not be so much variation as is found.

Extractum Colocynthidis Alcoholicum.—This formula may be looked upon as preliminary and auxiliary to that for the compound extract in which it was formerly included. The process is entirely practicable, and furnishes a good product where the drug has been selected. Forty-eight troy ounces of crude colocynth, and two gallons of diluted alcohol are required. The alcohol is nearly all recovered, and may be used again. The evaporation is continued to dryness so that the product will powder, in which state it is directed to be kept, and amounts to about one-seventh of the colocynth employed to make it.

Ext. Colocynth. Comp.—This formula has been modified nearly as prepared by Dr. Squibb, (see Amer. Jour. Pharm., vol. v. 97), which composition is based upon an analysis of the ingredients, as to the dry product of each as contained in the dried extract; by then using each ingredient in powder the uniformity of this very important preparation may always be controlled. By substituting resin of scammony for the scammony, a check is given to avoid the adulterated scammony of commerce, and the genuineness of scammony resin may be easily determined by chemical and physical tests.

The satisfaction attending the use of this form of the extract in dispensing is great, and were it not for its expensiveness it would be generally adopted; but despite the claims of the Pharmacopœia, druggists continue to use the old recipe with adulterated scammony or with a lesser proportion of scammony resin, the presence of which in the extract is the true cause of its high price. It has been suggested to use podophyllum resin in lieu of scammony, but while the recipe remains as it is this is not admissible.

Ext. Dulcamaræ.—This extract is made with diluted alcohol in lieu of water—the alcohol to be recovered by distillation.

Ext. Ignatiæ Alcoholicum is made precisely by the formula for alcoholic extract of nux vomica, which is modified by directing the drug in powder, instead of specifying the manner of getting it in powder.

The extracts of Cinchona, Jalap, and Podophyllum are, except in the language of the recipes, unchanged; and the same may be said of those of Gentian, Butternut and Quassia, except that the evaporation is now partly by ebullition.

Ext. Rhei Alcoholicum is modified, by using, first strong alcohol, and then diluted alcohol, so that by the spontaneous evaporation of the first liquid the odorous volatile part of the root may be more effectually retained in the extract. In the evaporation of the second liquid the temperature is limited to 160° F., but with a water bath heat, slowly conducted, distillation may be used to recover the alcohol without detriment to the product.

Extract. Senegæ Alcoholicum is one of the new preparations, and is a simple extract made by percolation with diluted alcohol, recovering the alcohol by distillation with a water bath heat. This extract affords an elegant means of making the decoction, extemporaneously, in dispensing; using about two drachms of the extract to a pint of hot water.

Ext. Taraxaci is unaltered.

Extract. Valerianæ Alcoholicum.—It has already been stated that this extract is prepared like alcoholic extract of aconite. When the preliminary percolation with strong alcohol is carefully conducted, the valerian being in fine powder, nearly all of the volatile portion of the root is included in the first liquid, and there is no impropriety in evaporating the second liquid by distillation so as to recover the alcohol; but this cannot be done with the first liquid, which in this case should be concentrated at near the ordinary temperature.

FLUID EXTRACTS.

In no respect is the Pharmacopœia more changed than in this chapter. Formerly five fluid extracts and two oleo-resins, called fluid extracts, were found in it; now twenty-five of these preparations are recognized, and public medical opinion goes much further, calling for a number of them not at present authorized.

Ext. Buchu Fluidum.—In the original formula for this preparation, suggested by the writer, (see *Amer. Jour. Pharm.* vol. xx. page 85), the strength was half a troy-ounce to the fluid-ounce. In the authorized formula it is made ounce to fluid-ounce. The most difficult point in the proper conduction of this process is to get the drug in powder without injury. It should be at least as fine as the Pharmacopœia directs, a 50 mesh seive powder; but there is no objection, rather an advantage, in having it finer, provided the volatile ingredient of the buchu does not suffer loss in getting it so. Very much depends, in the formulæ of which this is a type, upon the slow, regular, and thorough solvent action of the menstruum in obtaining the reserved liquid, in this instance twelve fluid ounces in bulk, as, independent of the isolation of nearly all of the valuable constituents which are thus exempted from subjection to the heat of evaporation, there is less need of pushing the percolation so far by which a less proportion of alcohol will be required—a point of great importance at the present juncture.

Buchu leaves contain much mucilage, which is excluded from this preparation, it not being deemed of any medicinal value, as was supposed in constructing the original recipe.

Ext. Cimicifugæ Fluidum. In this preparation, owing to the large proportion of resinoid matter it contains, the formula requires the use of stronger alcohol to the extent of a fluid ounce and a half for each troy ounce of the finely powdered cimicifuga, the whole of which is to be obtained as a concentrated tincture by displacement with diluted alcohol. The pint and a half of tincture thus obtained is, by spontaneous evaporation, reduced to twelve fluid ounces and set aside. Two pints more of percolate being obtained with diluted alcohol the liquid is to be reduced to four fluid ounces by evaporation at 150°. Now if the preliminary percolation has been well conducted, no injury will result from regaining the alcohol from the last percolate by distillation, but the first alcohol is necessarily lost, unless a vaccuum apparatus is employed. There is one point in the directions of this formula that needs correction, viz., in the last paragraph at page 163, last sentence; it should read, "Then add *it to* the tincture first obtained, very gradually, so as to avoid precipitation," &c. The italicized words are wanting. The reason is that the last evaporated liquid, being very nearly aqueous, will precipitate the resin from the tincture if the latter is suddenly mixed with it; but when the addition is gradually made in the contrary way this does not occur to much extent.

Ext. Cinchonæ Fluidum.—This is the formula of Alfred B. Taylor, as published, (*Am. Jour. Phar.* vol. xxiii., page 218), except that the quantity of sugar is reduced from 14 to ten troy ounces to the pint of fluid extract. When well made it is an opaque orange red liquid which, on standing, separates into a transparent syrupy superstratum and a sedimentary flocculent deposit, which easily incorporates by agitation and which is valuable, from the presence of cincho-tannates.

Ext. Colchici Radicis Fluidum.

Ext. Colchici Seminis Fluidum.—The proportions and manipulation of these two formulæ are nearly the same as those for buchu, but the menstruum consists of two parts of alcohol to one of water.

Fluid extract of colchicum root tends to deposit a sediment which, however, is of no value, and the sediment is larger in proportion to the weakness of the alcohol. On the other hand, the fluid extract of the seed tends to separate a fixed oil which rises to the top, and which appears to be inert, (see J. M. Maisch in

Am. Jour. Phar. vol. xii. p. 97). When carefully made they are powerful and valuable preparations, but the seed require to be in powder to be entirely exhausted by this formulæ.

Ext. Conii Fluidum.—The object of the acetic acid in this process is to give stability to the preparation, and to prevent the decomposition of the natural salt of conia during the evaporation. It is of the utmost consequence to choose the drug in a well-preserved condition and green color, and to have it in a uniform fine powder, to get nearly all of the virtues in the 12 fluid ounces of received fluid. In this instance it is necessary to lose the alcohol, rather than, by excessive heat, to endanger the preparation, unless the vacuum pan be used.

Ext. Dulcamara fluidum.—In this preparation bitter-sweet in moderately fine powder is exhausted with diluted alcohol, ,the alcohol regained by distillation, and sugar added for its preservation prior to the final evaporation, which, being concluded, leaves but little if any alcohol present. Some have found this preparation to ferment. I have generally found it to keep well, although on one occasion a disposition to eliminate gas was observed; but the preparation had not medically deteriorated. It will be easy to control this, by reserving two fluid ounces of the first tincture that passes, and after evaporating the fluid extract to fourteen fluid ounces, to add it. This precaution, however, is hardly required.

Extractum Ergotæ fluidum.—This preparation is made from finely powdered ergot, by means of acetic diluted alcohol in manner and proportion used for fluid extract of conium. The use of the acid was proposed by the writer of this notice at a time when propylamin was presumed to be the chief active constituent of the drug. It had long been known that the active matter of ergot was fugitive, and it was practically found, that a solution of ergot could be manipulated with little if any loss of power if kept decidedly acid. The discovery by W. T. Wenzell, (see *Amer. Jour. Pharm.* vol. xii. page 193, 1864,) of the presence of two organic alkaloids easily decomposible in their nature, lends additional reasons why acetic acid is a useful agent in preserving this important preparation. Fluid extract of ergot should have no odor of propylamin.

Ext. Gentianæ fluidum, is practically a concentrated tincture made by operating with diluted alcohol, reserving the first portion and evaporating the last. The still may be used to recover the alcohol from the last percolate. Fluid extract of gentian is a transparent deep brown, very bitter liquid, possessing the odor of the drug, and is an elegant means of prescribing this tonic in mixtures.

Ext. Hyoscyami fluidum, as originally prepared, was of half the officinal strength. It is now, very properly, of the proportion of minim to grain. The formula is very nearly identical with that for colchicum root, except that the final liquid is directed to be concentrated at a temperature below 150°. When a water-bath heat is used, it is probable that no injury would result from recovering the alcohol by distillation. The best English hyoscyamus, imported in glass, yields with this process a most valuable preparation, more reliable than the extract of commerce, and perhaps less deteriorated than the solid alcoholic extract prepared in the same manner, except further concentrated.

Ext. Ipecacuanhæ Fluidum.—The introduction of this preparation is one of the best innovations of the Pharmacopœia of 1860. The use of acetic acid as a means of securing the alkaloid in a soluble condition has been objected to by some as altering the previous character of the syrup; but the small quantity of acid used, and the small dose of the extract, is sufficient to render this reason invalid. By employing the finely dusted powder of commerce, the quantity of alcohol necessary to exhaust the root is very small when the process is carefully conducted. The separation of the matter insoluble in water that is taken up by alcohol and called resinous matter in the Pharmacopœia, has been objected to as injuring the emetic value of the preparation; but we believe this opinion to be erroneous, especially in view of the precaution of using acetic acid to secure the soluble condition of the emetia. To get a fluid extract that will mix, without separation of any flocculi, with simple syrup, requires careful attention to the conditions of the recipe as regards the separation of all the alcohol.

Ext. Lupulinæ Fluidum. In making this preparation, the granular character of the powder renders it too porous for slow percolation, and it is requisite to close the neck of the percolater by means of a cork until the percolate drops but slowly. In this way nearly the whole of the oleo-resin may be secured in the first liquid. When operating on a large scale a portion at least of the alcohol may be recovered from the second liquid. When carefully made from good material this fluid extract is well marked in its character, being strongly odorous of the lupulin, and fully represents it.

Extract. Pruni Virginianæ. This preparation has been already so fully remarked on in this Journal (vol. iv. pp. 22 and 106, and more recently in Proc. Amer. Pharm. Assoc., 1863, page 243), that it is unnecessary to dwell upon it. The chief points of attention are to secure genuine wild cherry bark, in fine powder; to percolate slowly; to free the preparation from alcohol *before* adding the almond emulsion, and to give the latter time to do its work. In making a quantity of this extract I have always preferred to use a muslin filter in a large glass funnel, and as the strong liquid ceases to be visible above, to add water so as to chase out the absorbed portion. If well made, this preparation, mixed with water without precipitation in all proportions, has a strong, hydrocyanic bitter taste.

Extractum Rhei Fluidum.—This formula needs to be modified. The fault is, the presence of so much alcohol as to cause the crystallization, and precipitation in granular form, of a large portion of the sugar. In the formula, as originally suggested by the writer, this fluid extract was not subject to this fault, but was considered too thick in consistence. To avoid this difficulty he suggested (Proc. Amer. Pharm. Assoc. 1859, p. 274), to employ alcohol instead of diluted alcohol, so as to avoid much of the gummy matter, and reduce its specific gravity, reserving the first liquid for spontaneous evaporation until free from alcohol. It was no doubt the intention of the revisors of the Pharmacopœia to accomplish this end, but unfortunately the effect of the presence of alcohol was not sufficiently considered in its relation to the solubility of sugar, which, though retained in solution for awhile, is gradually precipitated. Prof. Graham has suggested the use of a menstruum consisting of two parts of alcohol to one of water with aromatics in substance, thus operating on all and evaporating to one-fourth of the bulk of the tincture collected, and adding sugar in the proportion of six ounces to the pint of fluid extract. The probable remedy is either to evaporate the first solution farther to rid it as far as possible from alcohol, to add the sugar in the form of a hot syrup made with the evaporated second liquid of the recipe so as to make a pint; or, if the alcohol is left in the preparation then to use less sugar and more liquid. The writer has suggested the former plan in his paper on Fluid Extracts, (Proceedings Amer. Pharm. Assoc., 1863, p. 239).

The reader will also observe the absence of the aromatics of Pharm. 1850. This, by unmasking the natural odor of the drug, renders it easier to judge the preparation, affords a means of making the simple syrup, and, when needed, the aromatics can be added.

Extract. Sarsaparillæ Fluidum is a new preparation, a simple fluid extract, offering the physician a means of associating this drug in mixtures or syrups in any proportion he pleases. The sarsaparilla should be as fine as a fifty mesh sieve will make it. In this condition it becomes somewhat glutinous on adding the diluted alcohol, but the lumps formed should be rubbed between the hands until a uniformly damp powder is obtained; by then packing this moderately in the percolator a dense solution passes as the diluted alcohol traverses the powder, and the drug is exhausted with less diluted alcohol than the formula indicates. The same remarks apply to the preparation of the sarsaparilla in the compound fluid extract, which, unless the other ingredients are all equally well ground, should be moistened separately; but when all are in powder, as directed, there is an advantage in mixing the dry powders intimately before moistening, which in great measure prevents the sarsaparilla from getting into lumps. The writer has often spent several hours in properly moistening a mass of ingredients for twenty-five pints of this extract, and has been agreeably surprised at the small amount of menstruum which would exhaust them when properly prepared for percolation.

Extractum Sennæ Fluidum.—In comparing this recipe with that of 1850 the reader is at once struck with the absence of aromatics from the new fluid extract. The manipulation also is quite different. By reserving the first pint of percolate and evaporating it spontaneously to half a pint, much of the activity of the senna is removed and kept from the injurious action of heat in evaporating. The second liquid is directed to be mixed with the sugar and evaporated to half a pint on a water bath. By using a water bath still the alcohol may be recovered. The reasons for omitting the aromatics are: 1st. That physicians may suit themselves as to what aromatics they wish. 2d. That the odor of the senna will afford an index of the good quality of the preparation. 3d. That the fluid extract may be used in making mixtures of senna where the aromatics would be unnecessary.

Ext. Serpentariæ Fluidum. This fluid extract was introduced by Mr. Taylor, (see this Journal, vol. xxv., p. 206). The officinal process is like that for fluid extract of gentian.

Extractum Spigeliæ Fluidum. This is made by the formula for fluid extract of senna, and it is chiefly employed to make the compound fluid extract of spigelia and senna. The simple fluid extract of spigelia affords the physician an admirable means of prescribing this excellent vermifuge in mixtures, but its high price has at present thrown it greatly out of use.

Ext. Taraxaci Fluidum is made by a formula published in the Proceedings of the Association for 1859, by the writer of this, and is a concentrated tincture, containing but 25 per cent. of alcohol. It is a good preparation.

Ext. Uvæ Ursi Fluidum contains both alcohol and sugar as preservative agents, and is made by reserving a portion of the first tincture, evaporating the rest with the addition of sugar and mixing them.

Ext. Veratri Viridis Fluid. is made by extracting sixteen ounces of the finely powdered root with strong alcohol, reserving half a pint and evaporating the remainder to the same bulk and mixing them. It is an efficient preparation, twice the strength of Norwood's tincture, when made from well-selected hellebore.

Ext. Zingiberis Fluidum is made by a formula similar to that for fluid extract of valerian and of the same strength.

The consumption of alcohol in making fluid extracts, viewed in connection with the present high price of that article is a subject demanding the most serious consideration of manufacturers, druggists and apothecaries. The question has been raised whether it is good policy in the government to tax this agent of production so heavily; whether it does not decrease the consumption and consequently the manufacture of many preparations, and thus injure the revenue to an extent that will more than counterbalance that arising from the tax. This remark of course applies only to alcohol used in chemical and pharmaceutical manufacturing and the arts. But this is not the proper time for this discussion; a more important one is that of economizing the use of alcohol in manufacturing pharmacy. To make a gallon of a tincture of gentian it is clear enough that four pints of alcohol, besides that portion retained in the ingredients, must be consumed. But to make a gallon of fluid extract of gentian 12 pints of alcohol are required, and yet but about three pints are retained in the preparation, all the rest being either lost by evaporation or, if saved, regained as far as possible by distillation, but always with a considerable loss. A part of the alcohol consumed is that retained in the ingredients, for in order to obtain the prescribed quantity of tincture the addition of the menstruum must go on until it all passes. This applies equally to ordinary tinctures and to fluid extracts and many syrups. Dr. Edward R. Squibb, of Brooklyn, has suggested the idea whether it will not be more economical on the one hand and produce more efficient preparations on the other, in making fluid extracts, to stop the percolation when twelve fluid-ounces of percolate has passed from 16 troy ounces of the substance treated, and consider that as the finished preparation? He assumes the position that this quantity, if the percolation is conducted right, will on the average contain at least three-fourths of the virtues of the substance treated, and the great loss in alcohol occasioned by pushing the percolation to get the last fourth, as well as the injury to the drug by the heat of evaporation, will more than counterbalance the loss of what extractive matter remains in the percolator.

To establish the truth of this assumption would require a series of analyses, as well as a corresponding series of therapeutical experiments, and whilst admitting the great probability that the results in the main would be satisfactory if conducted by a careful manipulator, they could hardly be depended upon in general hands. The strongest reasons in its favor are the entire absence of heat in preparation, and the simplicity of the process; being in fact only the first steps of the process for a common tincture. If there were any checks known by which the uniformity of the results could be insured, the idea of Dr. Squibb might be adopted, but until then it is doubtful whether the average results would equal those now attained by the old recipes.

ON THE PREPARATION OF FANCY LEATHERS,—KID, CHAMOIS, &c.

By F. Crace Calvert F. R. S.

Extracted from the 3d Cantor Lecture.

Fancy Leathers.—Allow me now to give you a slight insight into the methods of preparing various fancy leathers, such as Morocco, Russia enamelled, tawed, or kid leather, used for soldiers' belts, gloves, &c, and lastly all leathers used for wash-leather, gloves, &c. Until the middle of the eighteenth century Morocco leather was wholly imported from that country, for it was in 1735 that the first Morocco works were established in Paris, and similar manufactories were soon set up in various parts of the Continent and in this country. The process by which Morocco leather is prepared is as follows:—The goat and sheep skins, which are especially used for this branch of manufacture, are softened, fleshed, unhaired, and raised or swelled by methods similar to those already described, but one essential element of success in this kind of leather lies in the perfect removal of all lime from the skins, which is effected by plunging the well-washed skins in a bath of bran or rye flour, which has been allowed to enter into a state of fermentation. The result is, that the lactic and acetic acids generated by fermentation of the amylaceous substances combine with the lime and remove it from the skins. The other essential point is the mode of tanning the skins. Each skin is sewn so as to form a bag, and filled through a small opening, with a strong decoction of sumac, and after the aperture has been closed the skins are thrown into a large vat containing also a decoction of the same material. After several hours they are taken out, emptied, and the operation is repeated. To render these skins ready for commerce it is necessary to wash, clean, and dye them. The latter operation was formerly tedious, and required great skill, but since the introduction of tar colours, the affinity of which for animal matters is so great, it has become comparatively easy. The skins, after they are dyed, are oiled, slightly curried, and the peculiar grain, characteristic of Morocco leather, is imparted to it by means of grooved balls of rollers. There are two inferior kinds of Morocco leather manufactured, viz., those called *roan*, prepared in a similar way to Morocco, but not grained, and *skivers*, also prepared in the same manner, but from split sheep skins. I owe to the kindness of Mr. Warren De la Rue the beautiful specimens of leather before me, which will enable you to appreciate the various qualities of these interesting productions.

Russia Leather.—The great esteem in which this leather is held is owing to its extreme softness and strength, its impermeability, and resistance to mildew, which latter property is imparted to it by the use of a peculiar oil in its currying, that is birch-tree oil, the odour of which is well-known as a distinguishing feature of Russia leather. As to its preparation, I will merely state that it is very similar to that of Morocco, with these differences, that hot solutions of willow bark are used instead of sumac; that it is generally dyed with sandal wood and a decoction of alum; and, lastly, as already stated, the birch-tree oil is used in currying it.

Enamel Leather.—This class of leather is usually prepared with calf and sheep skins tanned in the ordinary manner. They are dyed black by rubbing them over with a decoction of logwood, and then iron liquor or acetate of iron. The leather is softened with a little oil, and is ready to receive a varnish, which is applied by means of a brush, and composed of bitumen of Judea, copal varnish, oil varnish, turpentine, and boiled oil.

Tawed or Kid Leathers.—The manufacture of this class of leathers differs entirely from those already described, as their preservative qualities are imparted by quite different substances from those used with other leathers, the preservative action of the tannin being substituted by that of a mixture of alum and common salt. Let us examine together a few points connected with the production of this class of leather. One of the most interesting characteristics is the method of unhairing sheep, lamb, and kid skins, after they have been well washed and fleshed on the beam. The old process of unhairing by smearing on the fleshy side with a milk of lime, was improved by mixing with the lime a certain amount of orpiment, or sulphuret of arsenic, but Mr. Robert Warrington having ascertained that the rapid removal of hair in this case was not due to the arsenic, but to the formation of sulphuret of calcium, proposed, with great foresight, the following mixture as a substitute for the dangerous and poisonous substance called orpiment—viz., three parts of polysulphuret of sodium, ten parts of slacked lime, and ten parts of starch. The polysulphuret of sodium may be advantageously replaced by the polysulphuret of calcium. The skins, unhaired by any of these processes, are now ready to be placed in a bran or rye bath, as with Morocco leather, or in a weak solution of vitriol, to remove, as already stated, the lime. After the lime has been thoroughly removed from the skins, they are dipped in what is called the white bath, which is composed, for 100 skins, of 13 to 20 lbs. of alum, and 4 to 5 lbs. of chloride of sodium or common salt, and the skins are either worked slowly in this bath or introduced into a revolving cylinder to facilitate the penetration of the preservative agent, which, according to Berzelius, is chloride of aluminium resulting from the action of the chloride of sodium on the alum. When the manufacturer judges that the skins have been sufficiently impregnated with the above mixture, he introduces them into a bath composed of alum and salt in the same proportions, but to which is added 20 lbs. of rye flour and 50 eggs for 100 skins. After remaining a few hours they are removed, and allowed to dry for about fifteen days, and are then softened by working them with a peculiar iron tool, and the white surface which characterises that class of leather is communicated to them by stretching them on a frame and rubbing them with pumice-stone. A large quantity of tawed leathers are also preserved retaining their hair, which is done by simply suppressing the unhairing and rubbing processes.

Chamois, Wash, or Oiled Leather.—This class of leathers are named from the fact that formerly they were exclusively produced from the skin of the chamois, but at the present day sheep, calf, and deer skins, and even split thin hides, are manufactured into this kind of leather. I should also state that the employment of this kind of leather has greatly decreased of late years, owing to the general substitution of woolen fabrics in articles of clothing. You will see by the following description that the preparation of this class of leather differs entirely from those previously detailed; the conversion of skins into leather, or from a substance subject to putrefaction to one free from that liability, being no longer effected by tannin, as in the case of hides, and Morocco and Russia leathers, or by the use of mineral salts, as in the case of tawed leathers, but by that of fatty matters, especially animal oils, such as sperm. The skins are prepared in the same manner as for tawed leathers, and then submitted to what is called the prizing operation, which consists in rubbing the hair side of the skin with pumice stone and a blunt tool or knife, until the whole of the rough appearance is removed, and the skin has acquired a uniform thickness. They are then worked on the peg until the great excess of moisture has been wrung out, and plunged into the trough of a fulling mill, to the action of the wooden hammers of which they are subjected until nearly dry. They are then placed on a table and oiled, and several of them, after being rolled together, are replaced in the trough of the fulling mill. When the oil has been thus worked into the substance of the skins, they are removed, exposed to the atmosphere, again oiled, and once more subjected to the fulling mill; after which they are placed in a moderately heated room for a day or two, the object of which is twofold, viz., to facilitate the evaporation of the water and the penetration of the oil, and to create a slight fermentation, by which the composition of certain of the organic substances have undergone such modification as to enable them to combine in a permanent manner with the fatty matters. These processes are repeated until the manufacturer deems the leather sufficiently prepared to be fit to undergo the following operations, viz., to be immersed for several hours in a caustic lye bath, to remove the excess of oily matter, washed, and pegged. It is only necessary to stretch the leather on a table, then on a horse, and lastly between rollers, after which it is ready for the market. The ordinary buff colour of these leathers is communicated by dipping them, previously to the finishing processes, into a weak solution of sumac. Before speaking of the further processes necessary to fit these leathers for the glove manufacturer, allow me to have the pleasure of describing that of Mr. C. A. Preller, whose mode of preparing leather is very interesting, owing to the rapidity with which he converts hides into leather, and also to the remarkable toughness which his leather possesses. To attain these desirable ends Mr. Preller proceeds as follows:—The hides are washed, slightly limed, unhaired, fleshed, and partially dried; they are then smeared with a mixture made of fatty matters and rye flour, which having been prepared a few days previously has entered into fermentation, and which has so modified the fatty matters as to render them more susceptible of immediate absorption by the hide. I think that this feature of Mr. Preller's plan deserves the serious notice of all engaged in the manufacture of oiled leathers, as it appears to prove that fatty acids (or modified fatty matters) are better suited for combination with skins than neutral fats. The hides, with additional fatty matters, are then introduced into the large American drums, previously noticed in speaking of currying, and after four days they are removed, washed in an alkaline fluid, worked with a pummel and slicker, and after being dried they are ready for market.

Gloves.—The manufacture of this article is now a most important branch of trade, and is the means of giving employment to large numbers of people in several towns in this country as well as on the Continent. To render the above-mentioned oiled leather sufficiently soft and pliable for gloves it is necessary to submit it to the following further operations:—The Chamois, kid, or other skins are rubbed over with a solution composed of 1 lb. of soap dissolved in half a gallon of water, to which is added 1½ lb. of rapeseed oil and twenty yolks of eggs, or, what has recently been found to answer better than eggs, a quantity of the brains of animals reduced to pulp. The use of the two latter substances is extremely interesting in a scientific point of view, for they both contain a peculiar nitrogenated matter called vitalline, and special fatty matters called oleophosphoric and phosphoglyceric acids, which doubtless, by their peculiar composition, communicate to the skins those properties which characterise this class of leather. The skins are then washed and dyed in various colors, after which they are softened, and rubbed with an instrument adapted to slightly raise the surface, and give it that well-known velvetty appearance belonging to glove skins. I shall not take up your time by entering into the details of dyeing these leathers, but describe the following process for bleaching them:—

Bleaching of Skins.—The only process known until recently for imperfectly bleaching chamois and glove skins was that of submitting them to the influence of the fumes of sulphur in combustion or sulphurous acid, but latterly two modes of attaining that object have been proposed. The first consists in dipping skins for two days in a weak solution of neutral hypochlorite of soda, washing, drying, and rubbing them with soap and oil. The second mode is to dip glove skins into a solution of permanganate of potash, when they soon assume a brownish colour, due to the liberation of the oxygen of the permanganate of potash, and the fixation of the hydrate of sesquioxide of manganese by the skin. The skins so acted on are washed and then dipped in a solution of sulphurous acid, which becomes converted into sulphuric acid by the action of the oxygen of the sesquioxide of manganese, and the protoxide thus produced unites with the sulphuric acid, which is soluble in water. The skins thus bleached when dressed are ready for market.

Gilding of Leather.—The usual mode of ornamenting leather with gold is to apply, in such parts as are desired, a thick solution of albumen, covering those parts with gold leaf, and applying a hot iron, when the albumen is coagulated and fixes the gold. This plan is objectionable when the goods are intended for shipment, and the following method, lately proposed, is far preferable:—On the parts required to be gilt, a mixture, composed of five parts of copal and one of mastic, are spread; a gentle heat is applied, and when the resins are melted the gold leaf is spread upon them.—*Lond. Chem. News, July* 23, 1864.

THE PRODUCTION OF SULPHUR IN ITALY.

By M. P. Bianchi.

The sulphur at present produced in Italy amounts to no less than 300,000 tons a year, the value of which in the rough state is 30,000,000 francs. This yield, which has increased tenfold since 1830, is furnished in great part by Sicily. The quantity produced in Romagna, formerly but small, has since increased to 8000 tons per annum.

During the last ten years great improvements have been introduced in the method of extracting sulphur from its calcareous gangue. It is always obtained by liquefaction by burning a portion of the ore; but this operation formerly performed in small, open, cylindrical furnaces (*calcarelle*) is now effected by simply heaping the stones and covering them with earth as in charcoal burning. These heaps, called *calcaroni*, are of considerable size, often four hundred times larger than the old furnaces. This new mode of operating has the advantage of diminishing the losses occasioned by the production of sulphurous acid, so that the yield of sulphur is increased by one-fifth; besides sulphur can be burnt in this way near houses and gardens, which with the old method was out of the question. Formerly it was burnt only at certain periods of the year, now it can be burnt at any time, so that it is no longer necessary to accumulate large quantities of ore. Finally, the operation, which used to be very frequently fatal to the workmen, is now almost harmless.

Sulphur of Romagna and the Marshes—At Bologna there is a society called "Société des Mines de Soufre des Romagnes," which possesses eight mines, five in the province of Forli (Romagna) called Firmignano, Luzzena, Fosco, Busea, and Montemamro. The other three, forming part of the province of Urbino and Pesaro, are those of Perticara, Marazzana, and Montecchio.

Most of the sulphur from these workings is refined at Rimini, whence it is carried to the places where it is most in demand, such as Venice, Trieste, Ancona, Lombardy, Tuscany, &c.

This refined sulphur is chiefly used for making sulphuric acid, and lately for the treatment of the vine. Its price, which varies considerably, is, in cakes, from 213 fr. 10 c. per English ton of 1·015 kilogrammes, and in sticks from 254 fr. 35 c., put on board vessels in the ports of Rimini and Cesenatico, and delivered at the stations of Rimini and Cesana.

Sulphur from the Neapolitan Provinces.—Sulphur is found here in several places, but in small quantities. It is thus found in the volcanic region of Solfatares, where it exists mixed with clay and other matters, from which it is separated by sublimation, but the yield is insignificant. Small deposits of it are found scattered in the district of Majella, one of which is worked at Santa-Liberata. It has recently been announced that there has been discovered at Civita-Nova a bearing of calcaire impregnated with sulphur, but nothing has been said as to its richness and extent. No more is known of another bearing at Santa-Regina, two miles east of Ariano.

Sulphur of Sicily.—Sulphur exists here in a gypseous bed, layers of which extend over a small portion of the island, from Mount Etna to near Trapani. This formation belongs to a geological epoch which has not yet been positively determined. Here, as in Romagna, it contains, besides gypsum, calcaires and clays, more or less marl. In the first case, the sulphur exists in a state of mixture, sometimes uniformly, sometimes irregularly, sometimes in small parallel veins, and more rarely in the form of crystals; in the latter case it is not unusual to find it associated with *cœlestine*, or sulphate of strontium. In clay, on the contrary, it is found in globular masses, which is also the case in similar bearings in Continental Italy.

There are about fifty mines in Sicily, employing 20,000 workmen. The most productive mines are in the provinces of Caltanisetta and Girgenti; ranging next in importance are those of the provinces of Catana, Palermo, and Trapani. The sulphur is extracted in the manner above described by means of *calcaroni;* the loss during the operation amounts to one-third of the ore. Most of the sulphur is exported in the crude state, but little being refined in the island. In this state it is divided into three qualities, the second and third being subdivided into three other qualities. The yield in 1861 was estimated at about 250,000 tons of commercial sulphur, of which about half was produced by the province of Caltanisetta, a third by Girgenti, 25,000 by Catana, and 20,000 by Palermo; the quantity produced by the province of Trapani is very inconsiderable. Most of the sulphur is exported to France and England.

The price of this product has risen during the last few years; in 1860 it sold in the crude state for from 15 to 20 frs. the ton.—*Lond. Chem. News*, from *Moniteur Scientifique*, v. 799. 63.

THE APPLICATION OF DIALYSIS TO THE INVESTIGATION OF ALKALOIDS. NEW PROPERTY OF DIGITALINE.

By M. L. Grandeau.

Graham's admirable researches on molecular diffusion have given to chemical analysis valuable processes for the separation of certain bodies. Toxicology and physiological chemistry especially will profit largely from methods of dialysis.

For some months I have followed up these researches in the medical laboratory of the College of France, and beg permission to submit to the Academy my preliminary results.

Graham has shown that, by the aid of dialysis, very minute quantities of certain poisons, mixed with various organic matters, may be detected, especially arsenious acid and strychnine; and I have myself already experimented on morphine, brucine, and digitaline.

1. *Dialysis of Digitaline.*—Place in the dialyser 100 cubic centimetres of distilled water holding in solution 0 gr. 01 of pure digitaline. Suspend the dialysis after twenty-four hours; carefully evaporate to dryness the liquid contained in the outer vase in a weighed platinum capsule. It will leave a residue weighing exactly 0 gr. 01, with a bitter taste, and presenting the characteristics of digitaline, of which more further on.

Evaporate to dryness in a weighed platinum vessel the liquid remaining in the dialyser; it volatilizes, leaving no residue, all the digitaline having passed into the dialysed liquid.

2. *Dialysis of Urine, containing* 1 *gr.* 01 *of Digitaline.*—Into 45 cubic centimetres of fresh normal urine pour 2 cubic centimetres of a solution containing 0 gr. 50 of digitaline to 100 centimetres cube of water; after eighteen hours suspend the dialysis and evaporate to dryness the liquid in the outer vessel (about 300 cubic centimetres). Extract the almost colorless residue by alcohol; and the alcoholic solution, evaporated to dryness, shows all the characteristics of digitaline with as much clearness as the residue of 2 cubic centimetres of the normal solution of digitaline. Evaporate separately the contents of the dialyser, and the residue will be brown; then extract by alcohol of 95°, and the greenish solution thus obtained will give all the reactions indicating the presence of traces of digitaline. The dialysis then was not complete.

3. *Dialysis of Morphine, Brucine and Digitaline mixed with Animal matters.*—Take the stomach and intestines of a dog (some hours after death), macerate them in water at 25° or 30° for about two hours; filter the yellowish, strongly-smelling liquid through canvas. Divide it into four parts, each of 250 cubic centimetres; to the first add 0 gr. 04 of digitaline; to the second, 0 gr. 02 brucine; to the third, 0 gr. 02 of hydrochlorate of morphine; leave the fourth intact; dialyse these four liquids separately. After twenty-four hours carefully evaporate the liquids contained in the outer vessels; recover each of the residues by alcohol, to separate the mineral salts (salts of soda, lime, &c.) which have been dialysed. The ordinary reagents of brucine (nitric acid) and of morphine (nitric acid, perchloride of iron) clearly show the presence of these alkaloids in the residues of the alcoholic liquids. Digitaline is found equally in the water of the first vessel. Divide the residue of the evaporation of that portion of the liquid to which no vegetable alkali was added into several parts, and test it with the reagents used to discover brucine, morphine, and digitaline. This experiment is merely intended to show that the animal matters, to which the poisonous substances are added, do not by themselves, give reagents, colorations which might lead to error. The result of this test leaves no doubt as to the value of dialysis applied to researches of this kind.

In the course of this preliminary study I endeavored to find some reaction as much as possible characteristic of digitaline. Hitherto we know no reaction for distinguishing digitaline from other vegetable poisons, except the green color obtained by dissolving this substance in concentrated hydrochloric acid. This reaction, as has been observed, cannot be taken as an unfailing indication of the presence of digitaline, for the same color is produced by several other organic matters. The successive action of sulphuric acid and bromine vapors have hitherto seemed to characterize even very small quantities of digitaline. Pure digitaline takes a sienna-brown color on contact with concentrated acid, turning after a time to vinous red, and on the addition of water immediately becoming dirty green. When, instead of operating on, for instance, 1 centigramme of solid digitaline which has not yet been in contact with any liquid, we submit to the action of sulphuric acid the residue of the evaporation of several drops of a diluted solution of digitaline, the color, instead of brown, is lighter or darker reddish-brown, according to the quantity of material employed. With very small quantities of digitaline (0 gr. 0005, for instance), the color is rose, like the flower of the digitalis. On exposing digitaline, moistened with sulphuric acid, to bromine vapors, the mixture instantly becomes violet, and the shade varies from heartsease violet to mauve, according as there is present more or less digitaline. The coloration shown by sulphuric acid, and modified by bromine vapors, is most distinct with the residue of the evaporation of 1 centimetre cube of water containing 0 gr. 005 of digitaline ; it is also very clear with 0 gr. 0005 of this poisonous substance. It is observable with even the very faintest traces of digitaline. None of the following substances, which I have submitted to the same reaction, has evidenced this property :—Morphine, narcotine, codeine, narceine, strychnine, brucine, atropine, solanine, salicine, santonine, veratine, phlorhidzine, diturine, amygdaline, asparagine, cantharidine, cafeine.

Dialysis—and in this consists its greatest value—allows the separation of the vegetable poisons from the animal substances with which they are mixed, in a state sufficiently pure to enable us to identify them by their principal characteristics.—*Chem. News*, from *Comptes Rendus*, lviii, 1048.

GLEANINGS FROM THE FRENCH JOURNALS.

By the Editor.

On the Extraction of Cantharidin and on the Assay of Cantharides. By M. Mortreux.—Having observed that cantharidin is insoluble in sulphuret of carbon it occurred to me that this property might be employed in isolating the active principle of cantharides.

If cantharides are treated by chloroform, as has been indicated by Mr. William Procter, and the solution is evaporated, the cantharidin is obtained in the form of crystals disseminated in solid fat and green oil.

By now employing the sulphuret of carbon, this vehicle dissolves the fatty bodies and leaves the cantharidin nearly pure, which it is easy to collect on a filter and wash and weigh.

The study that I have made of these facts lead me to found on them a process for assaying cantharidin in cantharides. Here is the *modus faciendi* I offer:—

Introduce into the adapter of Payen's apparatus, for extraction by vapor, (a vapor percolater,) a wad of cotton, and on this a layer of fine washed sand, 10 to 15 millimetres.

The cantharides to be examined, being reduced to fine powder, 40 grammes (617 grains) are taken and placed on the layer of sand, when it is settled by jarring the beak of the adapter on the table; over the cantharides is put a thin layer of cotton, and above this a circle of filtering paper.

The adapter is then inserted in a flask containing three or four cubic centimeters of ether, which flask is connected by a lateral tube with another flask surmounting the adapter. The apparatus is then heated in a water bath, and when the vapor arrives in the upper flask about 60 cubic centimetres of concentrated ether are poured in the adapter and a safety tube adapted.

The distillation is continued until the liquor passes colorless (about three hours are required), when the apparatus is removed from the water bath; the upper flask removed, ten cubic centimetres of ether added, and on this disappearing below the paper, water is poured on to displace the ether. The ether is distilled off and the residue, after the total disappearance of the ether, is treated with 50 to 60 cubic centimetres of sulphuret of carbon and the whole thrown upon a double paper filter and well washed with sulphuret of carbon by means of a pipette.

The filters are then dried and weighed, the difference in weight between the empty filter and that containing the cantharidin gives the weight of that principle contained in 40 grammes of the cantharides treated.

By this method, in several assays, the product has ranged between 18 and 22 centigrammes per 40 grammes, an average of 20 centigrammes in 4000 centigrammes.* This process can easily be applied to the preparation of cantharidin for commerce.—*Jour. de Pharmacie*, Juillet, 1864.

On the alkaloid of Croton tiglium. By M. TUSIN.—The author believes he has recognized the presence of an alkaloid in the seeds of Croton tiglium like cascarillin, and which crystallizes like it, but which differs, nevertheless, by its relations with sulphuric and nitric acids. The author does not speak of its composition.

The process for its extraction is the same as that which has been employed by the author in preparing *ricinin*, [see page 423 of this volume] viz: The croton seeds are bruised, exhausted with water and the infusion evaporated. The product is exhausted by boiling alcohol; the alcoholic liquor is allowed to stand until a resinoid matter is deposited, and then evaporated partially, when on standing the *crotonin* is deposited in crystals. The paper does not say whether this principle is identical with ricinin or not—*Zeitschr. fur Chem. und Pharm. and Jour. de Pharm.*, July, 1864.

On a new falsification of Saffron. By M. GUIBOURT.—M. Vesque, Pharmacien of Lizieux, has received recently from a house in Paris, under the name of "*Safran du Gatinais*," 250 grammes of a saffron of inferior quality, containing about thirty per cent. of a material judged to be the stamens. Professor Decaisne, who has examined this substance, has recognized in the length of the filaments, the cylindrical form of the anthers and the large size of the pollen grains, that these stamens are those of a *Crocus*. But they are not the stamens of the mother

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*This is more than was found by Warner, who obtained 2·03 parts from 500 or 0·4 from 100, whilst the above is 0·5 per cent.

plant, which have been inadvertently collected with the stigmata, the color of which is yellow and easily distinguishable. They are evidently collected intentionally, dyed artificially and twisted so as to deceive the eye, and in quantity equal to nearly a half of the article. The adulteration is recognized by throwing a certain quantity in a glass of water. The stamens are instantly decolorized and float, whilst the true stigmata fall to the bottom of the water. On comparison with the figures of Hayne, these stamens belong to the Crocus vernus, by the cylindrical form of their anthers, rounded at the summit whilst the anthers of Crocus sativus are terminated like an arrow. Finally, this saffron contains also little marigold petals, colored red like the stamens; these sink in water with the stigmas of the saffron and are recognized by their base, their longitudinal nervures and three pointed terminations. I do not know what opinion to give of a merchant who thus falsifies saffron; the man who takes your purse from your pocket is not more culpable.—*Jour. de Pharm.*, Juin, 1864.

On the Double Carbonate of Potassa and Soda. By M. FEHLING.—This double salt presents itself in rhomboidal efflorescent prisms. It was formed accidentally in making yellow cyanide of potassium, and on another occasion during the preparation of saltpetre from nitrate of soda and potash of commerce. Its formula is $NaO, CO_2 + KO, CO_2 + 12\,HO$. It is very soluble in water and does not reassume its crystalline form on evaporation. It melts in its water of crystallization, which it loses nearly entirely at 212° F. Dried, it is not hygrometric except in very moist air.—*Jour. de Pharm. from Annal. der Chem.*

On a means of detecting Nitro-benzole in Oil of Bitter Almonds. BY M. DRAGENDORFF.—This test consists in acting on the adulterated oil with sodium in the presence of alcohol. This metal, in contact with pure oil of bitter almonds, disengages gas, which is augmented by the addition of alcohol, and white flocks, are formed. Nitro-benzole under the same circumstances with alcohol becomes deep brown or black and viscid.

In testing the adulterated oil, take ten or fifteen drops of it, add four or five drops of alcohol, and a fragment of sodium; a brown deposit, approaching black, in proportion as the nitrobenzole is in excess occurs. This reaction is instantaneous and when the oil contains from 30 to 50 per cent. of nitro-benzole one minute is sufficient to obtain a thick brown liquid.—*Jour. de Pharm.*

GLEANINGS FROM THE GERMAN JOURNALS.

Detection of minute quantities of Mercury.—F. C. Schneider, in an essay "On the chemical and electrolytic behaviour of mercury," states, that the slightest traces of this metal in solution, may be recognised by immersing in the liquid to be examined, the poles of a galvanic battery, both of which should be of gold. Upon the surface of the negative pole, a coating of gold amalgam is thus deposited, which is then to be removed to a test tube. This tube, after being hermetically sealed, is strongly heated, whereupon the mercury is sublimed, and collects in the further end of the tube. The addition of a *crumb* of iodine and gentle heat, is sufficient to produce the easily recognized red iodide of mercury.—*N. Jahrb. Ph.* xx. 309.

Cotton Seed Oil.—Lipowitz states, that the deep brown commercial oil parts with its coloring matter readily by treatment with alkaline solution, yielding from 80 to 85 per cent. of a clear yellow oil, which is almost entirely without smell, and resembles in taste the finest salad and poppy-seed oils. It solidifies at from 3° to 0° C. The crude oil, which may be ranked among the drying oils, has a sp. gr. of ·928 at 15° C. the purified oil of ·9206. The fatty portion of the crude oil amounting to 15 or 20 per cent., which is readily saponified by alkalies, may be obtained by the action of acids upon the soap in the form of a brownish or greenish buttery-like mass, which is well adapted for a wagon or machine grease, since it remains fluid a long time in a warm place, and does not resinify. It may also be used for the preparation of an odorless potash or soda soap.—*N. Jahrb. Ph.* xx. 330.

Indestructible Writing.—Lucas proposes for this purpose, an ink composed of 20 grains of sugar dissolved in 30 grains of water, to which is added a few drops of concentrated sulphuric acid. Upon heating this mixture the sugar becomes carbonized, and when applied to the paper leaves a coating of carbon which cannot be washed off. This stain is rendered more permanent by the decomposing action of the acid itself upon the paper, and thus made, it resists the action of chemical agents. The paper should, after drying, be passed through a weak alkaline solution to remove excess of acid.—*Breslauer Gewerbebl. N. Jahrb. Ph.* xx. 330.

Benzine as an Insecticide.—A mixture of 10 parts benzine, 5 parts soap and 85 water, has been very successfully used by Gille, to destroy the parasites which infest dogs. It has also been used with good results in veterinary practice, as an application in certain diseases of the skin; and thus diluted, is found to answer better than when used pure.—*Bull. de Ph. de Brux. N. Jahrb. Ph.* xxi. 36.

Preservation of Lemonade.—The spontaneous change which this liquid undergoes, and the early deposition of a granular salt, when prepared in a concentrated form, prevents its being kept longer than a few days. Ladi, has suggested the employment of the sulphite of magnesia as a means of preserving it for a longer time; the gradual oxidation by which it becomes converted into the sulphate of magnesia, appearing to prevent the alteration. A very small quantity is said to be sufficient. *Schweiz. Zeitsch f. Ph. N. Jahrb.* xxi. 39.

Preservation of Fresh Meat, &c.—Several specimens of fresh meat and fish, preserved by the following process, were exhibited during the late London Exhibition, by R. Jones and F. Trevithick, of London, and retained during the whole of the exhibition their fresh appearance. The uncooked meat is placed in a strong tin vessel, from which the air is exhausted by means of an air pump. A small quantity of sulphurous acid is then introduced which is rapidly absorbed by the meat, when the vessel is filled with pure nitrogen gas, and hermetically sealed. (Carbonic acid, which is more easily prepared, might perhaps answer as well.) *Dr. A. Geyger, in N. Jahrb. Ph.* xx. 215.

Estimation of Copper in vegetable extracts, food, &c.—Hager

dissolves or exhausts the substance to be examined in water containing acetic acid, and in the acid liquor immerses a stout platina wire, carrying at its lower end a piece of iron wire. After one to three hours immersion, copper, if present, is deposited upon the platina as a brownish coating; which is then removed to a test tube, in which has been placed four or five drops of pure nitric acid of 20 to 25 per cent. The copper thus dissolved, may now be made evident in the solution by its producing a blue color with an excess of caustic ammonia. In this way the presence of this metal has been detected in solutions in which neither ammonia nor ferrocyanide of potassium gave any reaction. This method is particularly applicable to vegetable extracts and juices, in which, on account of tannic acid and similar matters, iron alone gives but doubtful results. —*Ph. Centralhalle. N. Jahrb. Ph.* xx. 222.

Detection of the adulteration of arrow root with potato or corn starch.—According to J. F. Albers, (*Arch. d. Pharm.*,) this is effected with certainty, by means of their behaviour towards hydrochloric acid. When one part arrow root is shaken with three parts of a mixture of two parts hydrochloric acid of 1·12 sp. gr. and one part of distilled water, at ordinary temperatures, for about three minutes, no reaction is observable. But should corn starch be subjected to this treatment, it becomes changed into a gelatinous, translucent, and finally into a semi-fluid mass. Potato starch behaves in the same way, with the production of an easily recognized and characteristic smell.

If a mixture of arrow-root with one or more of these substances is to be dealt with, the arrow-root is to be separated by treating the whole for two to three hours with the hydrochloric acid, by which the arrow-root becomes soluble, and may be filtered from the remaining softish mass, which, when washed, dried in the air, and weighed, shows by the loss in weight the amount of arrow-root present.—*Viertiljh. Ph.* xiii. 276.

Tobacco Seed has been examined by F. M. Brandt, without finding either propylamia or nicotia. The latter alkaloid was discovered in the solid matter obtained by evaporating the aqueous extract, but was believed to be a product of the decomposition of some of the protein-like substances. The following are stated to be the organic constituents of tobacco seed, viz.: a fixed drying oil, protein-like substance, resin, sugar, gum, tannic, and oxalic acids. No less than 200,000 seeds were calculated to have been produced by a single plant.—*Viertiljh. Ph.* xiii. 161.

The musty smell which grain harvested in damp weather acquires, has been removed by Chalambel, by exposing it in the granaries to the drying influence of quicklime, (which however should be allowed to come in contact with it,) in the proportion of one part lime to fifty of grain.—*Zeitsch. f. deut. Lander. N. Jahrb. Ph.* xxi. 42.

NOTE ON AN ALKALOID OBTAINED FROM THE SEEDS OF RICINUS COMMUNIS, OR CASTOR-OIL PLANT.

By Professor Tuson.

It is well known that certain parts of several plants belonging to the Natural Order *Euphorbiaceæ*, as well as various pharmaceutical preparations obtained therefrom, have been long employed in medicine as remedial agents; and that, notwithstanding this circumstance, our knowledge respecting the chemical constitution and physiological action of the active principles residing in such bodies is even at the present day in an exceedingly unsatisfactory state.

For a considerable period I have devoted much of the time which I could snatch from that occupied in my regular professional pursuits to attempts at isolating the active constituents of the seeds and oils of castor and croton, of gum euphorbium, and of cascarilla bark, *i. e.* the bark of *Croton eleuteria* or of *Croton cascarilla.* Now although, as yet, I have not succeeded in accomplishing the particular object which I had in view when I commenced my experiments, I have nevertheless discovered several substances possessing chemical if not therapeutic interest, and it is one of these proximate principles which I have separated from the seeds and oil of *Ricinus communis* that I wish to partly describe in this communication. The compound to which I refer is an alkaloid, and I have provisionally named it ricinine.

Preparation of ricinine.—Crushed castor-oil seeds are exhausted by successive quantities of boiling water, and the matters soluble in water separated from the oil and other insoluble material by filtration through wet calico. The filtered liquid thus obtained is then evaporated to dryness over a water-bath, and the extract produced is treated with boiling alcohol so long as it exerts any solvent power. The alcoholic solutions are allowed to cool, when a small amount of a resinoid body precipitates. This is separated by filtration, and the filtered liquid is concentrated to a small bulk and allowed to stand all night. The next morning a mass of almost white crystals are found to have deposited from the alcoholic solution. These crystals are the new alkaloid, *ricinine.* It may be obtained perfectly pure by recrystallization out of alcohol and decolorizing by animal charcoal.

Properties of ricinine.—Ricinine crystallizes in rectangular prisms and tables. When placed on the tongue, it slowly manifests a feebly bitter taste, resembling somewhat that of bitter almonds. Cautiously treated on a microscope slide, ricinine melts and forms a perfectly colorless and mobile fluid, which on cooling solidifies into a whorl of acicular crystals. Heated between two watch-glasses, a sublimate is obtained, which appears to be unaltered ricinine. Strongly heated on platinum foil, ricinine first melts and subsequently burns with a highly luminous and fuliginous flame.

The best solvents for ricinine are water and alcohol; benzol and ether dissolve but a small quantity of the alkaloid. Heated with solid hydrate of potash it evolves ammonia, thus demonstrating the presence of nitrogen.

Concentrated sulphuric acid dissolves the alkaloid without coloring it, and the addition of bichromate of potash simply causes the development of a green color.

Iodic acid is not deoxidized by ricinine, even when these substances are warmed together.

Concentrated nitric acid dissolves ricinine without evolving red vapors, although heat be applied. On evaporating the solution thus produced to a small volume and allowing it to cool, groups of transparent and colorless acicular crystals develope. These crystals are rendered opaque by the addition of water.

Concentrated hydrochloric acid dissolves ricinine, but the hydrochlorate of the base, which is doubtless produced in this reaction, appears to be readily decomposed both by evaporation and dilution. A solution of ricinine in hydrochloric acid does not give a precipitate with a concentrated aqueous solution of bichloride of platinum, but on evaporating a mixture of these bodies well-defined octahedra and modifications of octahedra having a deep orange color crystallize out.

On mixing together cold saturated aqueous solutions of ricinine and perchloride of mercury no change is at first observed, but if the mixture be allowed to stand for a few minutes a mass of beautiful silky crystals, arranged in radiate tufts, is formed; which is so solid that the vessel in which the experiment is performed may be inverted without any fear of its contents falling out. The mercurial compound of ricinine is soluble in water and in alcohol, menstrua from which it may be purified by crystallization.

If ordinary castor-oil be shaken up with water, the water decanted and evaporated to dryness, a small quantity of resinous residue is left, which, when treated with boiling benzol, partly dissolves. If the benzolic solution of this residue be allowed to evaporate spontaneously, a small quantity of white crystals are obtained, which, so far as one can judge from their physical properties, are ricinine.

Neither ricinine nor the resinoid body which falls when the alcoholic solution of the aqueous extract of the seeds is allowed to cool, is the purgative principle of castor-oil or of the seeds from which it is expressed, for I administered two grains of each of these educts to a rabbit more than a month ago, and the animal has not evinced the slightest inconvenience, temporary or otherwise. The true active principles of officinal Euphorbiaceæ I am still seeking, and the nature of the results which I have already obtained, induce me to indulge in the hope that before long I shall be enabled to publish an account of them. I may be permitted to conclude this imperfect account of ricinine by stating that I have obtained a similar if not identical body from croton seeds, and, so far as I have yet discovered, differing in several important characters from those described as belonging to cascarilline, an alkaloid discovered by

Brandes in the bark of *Croton eleutria* or *Croton cascarilla*, both plants belonging to the Natural Order Euphorbiaceæ.—*London Pharm. Journ.*, from *The Veterinarian.*

ON THE USE OF QUINOVIC ACID (CINCHONA BITTER) IN MEDICINE.

By. Dr. J. E. De Vry.

When I found, in 1859, that all parts of the different species of *Cinchona* growing in Java contained quinovic acid, of which I detected in the wood of the roots of *C. Calisaya* so much as 2·57 per cent., it appeared to me very probable that the tonic properties of some preparations of bark, particularly of an aqueous infusion, such as the *Infusum Corticis Peruviani cum Magnesia frigide paratum*, which formerly was frequently prescribed by many Dutch physicians, might be at least partially ascribed to quinovic acid. I therefore employed the wood of several dead cinchona plants at my disposal for the preparation of this acid, which, by order of the Governor-General, was, at my request, experimentally tried by the medical staff of the Army. The official report on these experiments was so favorable, that the chief of the medical staff, Dr. Wassink, requested a further supply, in order to continue the experiments on a larger scale. As I had no more material at disposal with which to prepare quinovic acid, I wrote to my friend Mr. A. Delondre, at Havre de Grace, who was kind enough to send me not less than five kilogrammes of the crude acid from his manufactory of quinine. Although my laboratory in Java was perfectly adapted for all kinds of chemical researches, the purification of such a quantity of a substance famous for its bulky volume gave me not a little trouble, but at length I succeeded in preparing two kilogrammes of quinovic acid sufficiently pure for medical use. This quantity was used by the medical staff of the Army for experiments on a larger scale in the hospitals of Java and Sumatra. The general report on these experiments, the result of which was very favorable, has been sent by the chief of the medical staff, Major-General Dr. G. Wassink, to the Governor-General of Dutch India, under date 5th March, 1863. It appears from this report that the quinovic acid has been used in the hospital of the west-coast of Sumatra in sixty-five cases of intermittent fever, with or without complications, and in the great majority of cases with perfect success. In the hospital at Samarang, it has been used with the same success in forty-five cases, and it is with great satisfaction that I quote the following passage from the report respecting the experiments at Samarang:—

"The application of quinovic acid in diarrhœa and dysentery was made in consequence of the observation of its physiological action in diminishing the secretion of the intestines, which was attributed to a diminution of the peristaltic motion. In this aspect also the results were very satisfactory, and it is therefore a new property of the quinovic acid discovered, which agrees with the tonic properties which have been ascribed to it by Dr. de Vry."

It appears therefore not only that my suggestion about the tonic properties of the quinovic acid is well founded, but also that it is a remedy against intermittent fever. I therefore venture the suggestion to use the leaves of cinchona in British India against jungle-fever, which is in many districts a real plague. If the leaves are collected in the different cinchona plantations, which can be done without great cost, a tincture could be prepared from them with *proof spirit*, in which menstruum quinovic acid is easily dissolved, but not chlorophyll and some other inactive substances. I have much expectation that the proper use of such a tincture as a prophylactic would prevent many cases of jungle-fever in the localities where they are endemic. As the manufacturers of quinine throw away every year some hundred pounds of a substance containing quinovic acid, there is abundance of material for further experiments. I have found besides that the so-called *naucleic acid*, discovered by Mr. C. Bernelot Moens, military pharmaceutist at Batavia, in a species of *Nauclea*, is identical with quinovic acid; and as, according to my investigations, all the species of *Nauclea*, which are plentiful in the forest of Java, contain this acid in their bark, we have here another source whence an abundant supply could be obtained.—*London Pharm. Journ.*, July 1, 1864.

TÆNICIDE PROPERTIES OF PEPO.

With Report of a Case in which it was Successfully Used.

By E. Ingals, M. D.

Pepo—made officinal by the Pharmacopœia of 1860—has been known now for more than a century, to possess properties destructive to the tapeworm. The influence of the doctrine of signatures is said to have first suggested its use for this purpose. Inasmuch as there was observed to be a degree of resemblance between the pumpkin seed and the joints of which the body of the worm was made up, it was surmised that it would be the proper remedy to be used with a view of ridding the system of this troublesome parasite—and as fortune would have it, a doctrine that has its foundation only in ignorance and superstition, was in this instance the parent of truth. But though the pumpkin seed has been so long known as a remedy for tapewarm, yet it has never been extensively employed for this purpose, especially in this country. Its use was introduced into the United States by Dr. J. A. Smith, of Boston, in 1850.

Since that time a considerable number of cases of its successful employment have been reported in our medical journals—such reports, coming mostly from physicians practising in the Eastern portion of the Republic, and we have reason to think that the remedy has been used there more than at the West or South. The seeds contain a fixed oil, which may be obtained from them by expression, and to this is said to be due their medicinal virtue. Some cases of tapeworm have been successfully treated by the administration of this oil, a fluid ounce being given at one dose, to be followed in two hours by some active cathartic; but the oil is not known to possess any advantages over the seeds in substance.

The case in which we used this remedy occurred in a healthy boy, eleven years old, who, for two months before his parents brought him to me, had been voiding a number of joints of the worm daily, and his previous symptoms, as related to me, justify the conclusion that he had been afflicted with it more than a year, though no treatment had been resorted to, as they did not suspect the nature of the malady. The health of the child did not suffer, except that he was troubled somewhat at night by a cough of a spasmodic nature, and the parents noticed that this was always much worse when the child took milk for his supper, and likewise that prompt relief was sure to follow the taking of some bitter substance. I directed that ℥j of the pumpkin seeds should be freed from their shells, and then with ʒiv of sugar and ℥vj of water, to be made into an emulsion, and of this one-third was to be taken every hour, after fasting from supper until morning, and in one hour after the last dose ℥ss of castor oil. As this failed to act on the bowels, three hours after, ℥j more of the oil was given, which produced only a mild laxative effect, and this not until three hours after it was taken, bringing away only about thirty segments of the worm. This was on Sunday, and not wishing to keep the boy from his school, I postponed further treatment until the following Saturday, when I ordered the same amount of emulsion as before, directing that one-half of it be given in the morning, fasting, the remainder in half an hour; and one hour thereafter, ℥xij of the liquor magnesiæ citratis. In a little more than two hours this occasioned active catharsis; the first three dejections containing only disjointed segments of the worm, but the next brought the entire parasite, a tænia solium, twenty-two feet in length but not dead.

I have reported this case, not as anything new, but hoping it may have some influence to induce others to test the virtues of this article. To obtain a medicine that shall be efficient for the cure of disease, at the same time that it is absolutely innocuous to the patient, is a desideratum greatly to be desired, but not always found. Of this remedy it is known that its use is neither unpleasant nor injurious, and it remains only to demonstrate its efficacy, and it is not unlikely that experience may prove it to be the best remedy for tapeworm, all things considered, that we possess.

The following are some of the advantages that the pepo may perhaps justly claim over other tænifuge remedies in common use, as the male fern, the bark of the pomegranate root, kousso, oil of turpentine, etc., 1st. To the patient it is entirely harmless and is not unpleasant to take. 2d. In this country it may always be obtained, and of a quality known to be good. 3d. To us it is indigenous, and other things being equal, such remedies should be preferred before those which are imported, especially in times like the present, when the whole nation should husband every resource, however trifling, for martial purposes.

Some recommend that the remedy be given in large quantities, and during a number of days, and without the adjuvant of a cathartic, for the emulsion itself when thus administered acts as a laxative; but we think an active cathartic should never be omitted, for its operation is capable of expelling a worm enfeebled by the effects of the medicine, but not to a degree to insure its death if left in the alimentary canal. It may be proper to say, that among the people who have experience with domestic remedies, there is an opinion somewhat prevalent, that the pumpkin seed is an efficient remedy for the destruction of the ascarides lumbricoides, but I am not aware that this has been confirmed by the observation of the profession.—*Chicago Med. Journal.*

ON THE ROOT-BARK OF THE CINCHONÆ.

By J. E. Howard, F.L.S.

A letter from a gentleman owning a district in New Grenada, containing trees of Cinchona, has been put into my hands by Mr. Markham. It shows very satisfactorily that the reprobation of the practice of extirpating these trees, which has found utterance in England, is beginning to produce a salutary effect in South America.

The letter is from Don Narciso Lorenzano, and is dated Bogota, March 4th, 1864. He writes to his correspondent (— Griffiths, Esq.) as follows:—

"I have to thank you for having sent me a copy of the 'Edinburgh Review' of last year, in which I have had the satisfaction of reading the article on the cultivation of the *quina* trees in the East Indies. Permit me to congratulate you on the successful result of this undertaking, which partly ensures the supply of so precious a drug for the future. It appears to me that the principal motive which induced the government of India to commence this cultivation, after overcoming so many difficulties, was the fear that the *quina* trees would be extirpated, in consequence of the disorder and waste that is allowed in the woods, where they are destroyed by the barbarous method of pulling up the roots. Fortunately this destructive method, which, without any doubt, would extirpate this precious plant in a few years, is only practised in the forests of Pitayo, where it is due to the immoderate desire of making money which has taken possession of the Indians who own the greater part of the land. But in none of the other establishments for the collection of bark, in this country, has a similar scandal been repeated. On the contrary, beneficial rules are observed for the conservancy of the woods, more especially in those where I have a proprietary interest. The method consists in leaving a part of the trunk, about three feet in height, whence shoots may sprout, and in clearing away the surrounding trees to enable the rays of the sun to penetrate. By this means most of the trees that are cut down quickly shoot up, and the rays of the sun penetrating to the cleared ground, the seeds which fall from the tree germinate freely. Thus we have the satisfaction of seeing, in the forest worked on this principle, that the trunks of cut trees send out new shoots, and that the young plants grow vigorously. This result gives us full confidence that the good kinds of *quinas*, which exists in the country, will be permanently preserved.

"From the above considerations we may conclude that there need be no fear that humanity will see itself deprived of this precious medicine, seeing that as well in Bolivia as in Peru, Ecuador, and New Grenada, the rule of cutting the bark according to a fixed plan is observed, and care is taken that the woods are replenished with increased numbers of plants of the best species, while some experiments have been made in forming plantations on land where the best conditions for their growth are found. From all this we hope that in a few years we may see magnificent results."

There can be but one opinion as to the inexpediency of continuing the "barbarous practice" referred to, whatever comes of the question as to the comparative produce of the root-bark. My observations apply to the root-bark of the Calisaya as found in commerce accompanying that of the trunk and branches. The low price which this brings, amid all the keen competition of the bark sales here, is sufficient evidence of its inferiority. I have just examined a favorable specimen, which is probably still unsold. This contains some better bark of the trunk mixed with a preponderance of that of the root. Separating this last, I found that it would be worth about half the price of flat Calisaya.

This question ought certainly to be set at rest, as it easily might be by the sacrifice of some half-dozen trees out of the million plants of the *Cinchona Pahudiana* which the Dutch possess in the island of Java. If, from the root-bark of these a competent proportion of commercial sulphate of quinine can be obtained to defray the expense of cultivation, then the important fact of their value will be established; but I believe this has not yet been done.

In time for the next number I hope to send a paper on the so-called "bark from the root of *C. lancifolia*" which is really a very interesting new variety of the *C. Pitayensis*—the *Pitaya roja* of commerce.—*London Pharm. Journ.*, July 1, 1864.

PROPERTIES OF SILICATES.—NEW ANTIDOTES.

To the Editor of the Chemical News.

Sir,—Gelatinous silica being known to be soluble in alkaline solutions such as those of caustic soda, it might fairly be presumed that it would also be soluble in an alkaline silicate, although I am not aware of this having been published as a fact.

But the same property could not probably have been anticipated of the silicates of the earth and metals. The silicate of magnesia, for example, in the gelatinous or recently prepared state, is not soluble in a solution of caustic soda, but readily so in a solution of silicate of soda; and the latter rule holds good through all the series of silicates.

The solvent power of the alkaline silicates seems, therefore, to be altogether different in degree and in other important particulars from that of other alkaline solutions. Hence through this property we have soluble glass in as great variety and of tints as various and delicate as we have in stained glass. The soda silicate of cobalt is of a beautiful rose color—that of chromium green, &c. But the tints of the metallic-colored silicates are modified by solution in the colorless compound soluble silicates—that of copper, for instance, in a soda silicate of magnesia, is different from that of its solution in silicate of soda.

The above fact will, I think, be sufficient to indicate the importance of a true knowledge of the compound soluble silicates in geology and mineralogy, and lead to a more exact explanation of the color of a great number of minerals and of many of the precious stones.

The silicic acid of the alkaline silicates again displaces the carbonic acid in carbonates, even at the ordinary temperature, and very rapidly by the aid of heat. This fact will aid towards explaining the formation and composition of many rocks, and be a guide in the production of artificial stones in endless varieties.

As regards agriculture, the ammonio-silicates seem not only to be the most soluble, but also to possess the greatest solvent powers of all the alkaline silicates. When we add to the series the phospho-silicates, also highly soluble, it seems to me that a field of investigation is laid open worthy of the highest science of the day in the department of agricultural chemistry, and which, if followed, is likely to lead to practical results of vast importance, and to a true solution of many things that have not hitherto been satisfactorily explained.

There is still another field open to investigation with these interesting compounds, namely, the use of them as antidotes to poisons.

For this purpose I would suggest the soda silicates of magnesia, alumina, and lime. In case of any poisonous mineral salt being taken, an instantaneous precipitation of an insoluble silicate would occur in the stomach, and probably without the least injurious effect to the coats thereof, by prompt administration of a diluted solution of any of the above-named compound soluble silicates, or of a solution of silicate of soda saturated with gelatinous silica. It is a question which I have commenced investigating, whether the alkaloids may not be rendered insoluble, and therfore inert, through their means.

I am, &c.,

Bangor, June 28. HENRY ELLIS.

MANUFACTURE OF FATTY ACIDS FOR CANDLE AND SOAP MAKING.

By H. M. Mege-Mouries.

My researches on amylaceous grains, especially wheat, have furnished the means of substituting for brown bread, in Paris, a cheaper and more nourishing kind.

Analagous studies on oleaginous grains have altogether modified the economical conditions of two great manufactures. I will proceed at once to the results.

In oleaginous grains during germination, as in the animal economy during life, neutral fats pass, before undergoing any other modifications, into the state of very mobile globules, presenting a very large surface to the action of reagents.

In this globular state, fatty bodies manifest peculiar properties; we will mention those directly connected with the subject of this memoir.

1st. A fatty body in the ordinary state—suet, for instance—quickly becomes rancid by exposure to damp air: in the state of globules, on the contrary, it will keep for a long time, either liquid or dry, and as a kind of white powder (I possess specimens prepared in June, 1863).

The globular state may be produced by yolk of egg, bile, albuminous matters, &c.; for industrial purposes, it is produced by mixing tallow, melted at 45°, with water at 45°, holding in solution from five to ten per cent. of soap.

2d. Tallow, in the ordinary state, like other fatty bodies, resists washings in hot soda ley, and combines with it only with very great difficulty; in the globular state on the contrary, it immediately absorbs this washing out, in quantities varying with the temperature, so that it is possible, so to speak, to distend and contract each globule by lowering or raising the temperature between 45° and 60°.

It is easy to understand that in this case each globule of the fatty matter, attacked on all sides by alkali, abandons its glycerine with such rapidity as speedily to produce a liquid in which each globule is a perfect soap globule, inflated with lixivium. This can be effected in two or three hours.

3d. These saponified globules, when exposed above 60°, gradually reject the lixivium with which they were distended, retaining only the quantity of water always entering into the composition of soap. They then become transparent, semi-liquid, and their confused mass forms a layer of melted soap above the lixivium, which contains the glycerine.

4th. The saponification of this mass is so complete that to extract the stearic acid, it is only necessary to dilute the soap in cold water, and acidulate with a quantity of sulphuric acid proportioned to the soda. The fatty acids, mixed with water charged with sulphate of soda, may be separated by melting and pressing when cold, to obtain stearic acid, inodorous and fusible at from 58° to 59°, and almost colorless oleic acid.

These results, tested by industrial experience, recall the time when M. Chevreul, after his remarkable investigation of fatty bodies, believed that stearic acid could be economically produced with oleic acid. Unfortunately, all attempts to carry out this idea have failed.

Thus lime has been employed, the soap of which decomposes only by very strong measures, giving rancid, colored oleic acids, whilst producing a loss in the deposits of sulphate of lime, without counting a number of costly operations; then came distillation, which increased the loss from 10 to 15 per cent., and lowered the value of the product so much, that one part of stearic acid disappeared, and the oleic acid was rejected on account of its odor, its color, and its inapplicability for making an agreeable soap; then came the splitting up of the fatty body by water under pressure; but then the incomplete saponification and diffused crystallization became an obstacle to all subsequent operations. Finally, instead of pure water, a small proportion of lime, soda, or soap was put in the digester. The saponification still remained incomplete; the decomposing and pressing operations gave the same results in this as in the preceding instances, yielding only a kind of stearic acid, with a very low fusing point, and a red oxidised oleic acid to the value of 85 or 88 frs., while the olive oil was worth 130 and 135 frs. (These various operations have been described by MM. Pelouze, Tilman, Melsens, Podwer, &c.)

In the new operation all this is reversed; the loss is *nil,* being limited to the subtraction of the glycerine; the quantity of fatty acids obtained is 96—97 per cent. The operation is carried out in a single day; thus, operating on 2000 kilogrammes, three hours are required for the saponification, one hour for the decomposition, three hours for the fusion and settling, for the crystallization eight hours, for pressure when cold in a double press four hours, making altogther nineteen hours for the operation; and as the crystallization takes place in the night, there is in effect only eleven hours' work.

By this simple method we effect not only great economy in labor, fuel and product, but also, thanks to the lowness of the temperature throughout, we obtain an inodorous, unaltered stearic acid, fusible at 58°—59°, and an oleic acid, equal, if not superior, to the best oils used in soap making.

It is obvious that this manufacture is revolutionized. Fatty bodies are now treated to produce stearic acid, leaving oleic acid as residue; in future, the same fatty bodies will be treated to obtain oleic acid, and the price of stearic acid will be lowered by the value of the oleic acid obtained.

Thus M. Chevreul's prognostications will be realized, and the products of France, where this manufacture originated, will no longer be inferior to those of foreign countries.

Soaps.—The best white soap may be made from pure oleic acid, either alone or mixed with other oils. None but neutral oils can be used, such, for instance, as are now used for Marseilles soap. In the first case—that is to say, when oleic acid only is used, the glycerine being removed—it suffices to saturate this acid by a feeble washing. The soap globules form immediately, and no delay is required before fusing them. On the contrary, when oleic acid is mixed with other oils, or when only neutral oils are employed, the process described for suet is used. The fatty bodies are converted into the globular state, the globules being kept in motion by a hot and salt lixivium until complete saponification. The saponified globules are separated by fusion, the soap is melted, separated from the lixivium, and poured into the moulds where it solidifies by cooling. The operation requires six hours' effective work, and in twenty-four hours a soap is obtained as perfect as neutral, and lathery as old Marseilles soap. (The specimens of silk presented to the Academy had been comparatively treated at the Gobelins manufactory with Payen's white Marseilles soap more than eight months old, and with soap made only three days by the process above described.) Saving of time is not the only advantage of this process. It is obvious that each globule, being separately attacked both inside and out, without becoming agglomerated or cooked *en masse*, no portion escapes saponification. Moreover, caustic soda, acting at a medium temperature, does not alter the fatty bodies, as in the ordinary processes, in which part of the oils is carried off in the colored and frothy lixivium, thus entailing a notable loss.

It results, then, that in twenty-four hours a soap can be made, in greater quantities, as pure, as neutral, whiter, and lathering better than the best white Marseilles soap, requiring for its manufacture thirty or forty days, and then kept several months. These researches I hope will tend to check the introduction of a host of injurious products sold under the name of soap to the injury of the needy population; and I further hope that the manufacture of soaps and of stearic acid may be raised from the comparatively present low state into which it has fallen.—*London Chemical News*, June 18th, 1864, from *Comptes Rendus*, lviii., 1864.

THE PHARMACOPŒIA [BRITISH] PROCESS FOR CITRATE OF IRON AND QUININE.

TO THE EDITOR OF THE PHARMACEUTICAL JOURNAL.

Sir,—Having unsuccessfully tried to prepare some "Citrate of Iron and Quinine" according to the process described in the new British Pharmacopœia, and having, after repeated trials, come to the conclusion that the process was a fallacious one, allow me to ask you the favor of publishing in the next 'Pharmaceutical Journal' the following receipt of mine, which not only gives an elegant preparation, but also a product similar in every respect to that found in commerce.

I am, Sir, yours obediently,

Mauritius, May 6th, 1864. E. Fleurot, M.P.S.

Ferri et Quiniæ Citras.

Take six fluid ounces of a *saturated* solution of citrate of *per-*

oxide of iron,* made of such a strength that this quantity shall exactly represent six drachms of the anhydrous salt.

To such a solution, heated by the water-bath, add one drachm of citric acid previously dissolved in one ounce of distilled water, and immediately afterwards add at once the quantity of *quinia* freshly precipitated by solution of ammonia from two drachms of disulphate of quinia. Continue the application of heat, and stir the mixture constantly until all the quinia is dissolved. Solution of ammonia (P.L.) is then added drop by drop in suf-

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* The saturated solution of *citrate of peroxide of iron* is made by saturating at the heat of the water-bath a solution of citric acid with freshly-prepared *hydrated sesquioxide of iron*, until no more oxide is dissolved in the solution of citric acid. The excess of oxide of iron is then removed by filtration, and the liquid evaporated to such a strength that every fluid ounce must represent one drachm of anhydrous citrate of iron.

[NOTE.—In order that our readers may appreciate this paper we append the following condensed view of the process of the British Pharmacopœia for this salt:—

Take of Solution of Persulphate of Iron, 3 fluid ounces;
Sulphate of Iron, an ounce (Av.);
Solution of Soda, 36 fluid ounces;
Citric Acid, 2¼ ounces (Av.);
Sulphate of Quinia, 380 grains;
Distilled Water, Dilute Hydrochloric Acid, Solution of Chloride of Barium and Solution of Ammonia, of each a sufficiency.

Dissolve the sulphate of iron in 10 fluid ounces of the water, mix with it first the persulphate solution and then the solution of soda, stirring constantly; then wash the precipitates in a muslin filter till tasteless. Dissolve the citric acid in 20 fluid ounces of distilled water, and dissolve in it the precipitated oxide of iron, by aid of a water-bath heat.

Dissolve the sulphate of quinia in half a pint of water by aid of sufficient muriatic acid, and add solution of chloride of barium till all the sulphuric acid is precipitated; then filter, add a slight excess of ammonia, collect the precipitated quina on a filter and wash it thoroughly.

Lastly, dissolve the quinia in the solution of citrate of iron on a water-bath and evaporate in thin layers on glass at a temperature below 212° F.

The writer has adopted a process analogous to that in the U. S. Pharmacopœia, except in quinia strength and in the introduction of ammonia to give the greenish-yellow appearance to the salt; our salt being reddish-brown when in thick scales, and yellowish-brown in very thin scales.—EDITOR AMER. JOURN. PHARM.]

ficient quantity (about 2 fl. oz.) until the desired yellowish-green color is obtained. The mixture must be stirred up briskly after the addition of each drop of ammonia.

Great care should be taken not to add an excess of solution of ammonia; the solution must, on the contrary, be slightly acid to litmus paper. The liquid is then left to evaporate on the water-bath until it acquires a syrupy consistence, when it is spread with a brush on glass plates, and placed in a stove to scale.

Note.—It sometimes happens that the solution of the salt in water has a milky appearance; this shows that there was not a sufficient quantity of citric acid in the preparation; it is obvious, then, to try a little of it previous to its concentration. For this purpose, take a small quantity of the liquid, dry it on a glass plate, and examine the salt as to its solubility and transparence. If, on dissolving the salt in water, the solution is not found to be quite clear, add to the preparation, while it is on the water-bath, a few grains of powdered citric acid, and repeat the process of drying, etc., etc., until you obtain a perfectly transparent solution.—*London Pharm. Journ.*, July 1, 1864.

THE DETECTION, DISTINCTIVE CHARACTERISTICS, AND ESTIMATION OF NATURAL ORGANIC ALKALOIDS.

By M. Alfred Valser.

[The following notice of a recently published thesis will probably supply our readers with a few useful hints on the subject of which it treats.—Ed. C. N.]

The thesis is divided into three parts. The first gives the means for filling up the hiatus in Stas's process for morphine, and indicates a general reagent for alkaloids. The second part treats of the reactions peculiar to each. The third part concerns the determination of their equivalents.

In the first part of his paper M. Valser clearly shows the insufficiency of Stas's process, an insufficiency already pointed out by MM. Lefort and Reveil relative to the detection of morphine in poisoning cases. Being insoluble in ether, morphine could not be obtained free by that method. The author has endeavored to substitute for common ether a solvent capable of obviating this inconvenience. This substitute he has found in acetic ether, which dissolves morphine at least as well as alcohol. After devising a method for rectifying commercial ether, he makes use of this solvent in the following way:—

The substances to undergo examination having been treated as far as possible by Stas's method, he adds to the residue, already exhausted by ordinary alcohol, a certain quantity of potash and acetic ether, which take up any morphine there may be remaining. On evaporating separately the simple etherized liquid and the acetic ether liquid, the morphine left in the residue left by the latter is recovered, all other vegetable bases being included in that which furnishes the simple ether. At this point it is necessary to ascertain whether these residues are indeed the alkaloids. Their usual reagents, such as tannin, chloride of gold, iodised water, phospho-molybdic acid, &c., not being exempt from drawbacks, the author prefers the reagent used by M. de Vry in researches on atropine and strychnine; that is to say, double iodide of mercury and potassium. M. Valser finds it possesses the invaluable property of entirely precipitating alkaloids, it being so exquisitly sensitive to their presence as to indicate $\frac{1}{100000}$ of strychnine in a liquid. Moreover, this double iodide precipitates none of the other principles contained in the vegetables, except the albuminoid matters; but the presence of these matters is not encountered, since they are eliminated by the ether in Stas's process.

These facts once admitted, the author makes use of this reagent, whose general utility and sensibility is incontestible, to establish the presence of alkaloids in oils of belladonna, hemlock, &c., which before was only suspected.

The second part is devoted to researches on the distinctive characteristics of alkaloids. Finding the most characteristic reactions on these matters produced by oxidising bodies, the author tried each of them successively at various temperatures; sulphuric acid alone or associated with binoxide of barium or binoxide of lead; hydrochloric acid with binoxide of barium; chloride of gold and caustic potash. With each he elicited distinctive characters.

The third part comprises a study of the estimation of alkaloids and the determination of their equivalents. "Observing with what facility the solution of double iodide of mercury and potassium detected the least trace of alkaloids, the author was induced to examine whether the resulting combination could be exactly defined, and whether he could obtain a precipitate invariable in weight and characteristic of each of them." Such, in effect, is the result he obtained whilst experimenting on a certain number of vegetable bases. The high equivalent of the reagent employed, the great density of the alkaloid precipitates, their insolubility in aqueous liquids, even when acidulated, enabled him easily to determine, not only the composition of these precipitates, but the equivalents of the alkaloids themselves.

This new method leads M. Valser to conclude that we must revert to the old equivalents for quinine and cinchonine, which are but half those since adopted. He also found by the same means that quinidine is isomeric, not polymeric, with quinine.

The author desired to apply his reagent for the estimation of vegetable alkaloid matters, but the presence of albuminous and extractive principles vitiated the results. Further, preceiving that the processes used in these researches, besides being insufficient, occupied too long a time, he successfully modified them by combining the successive action of the proper solvents in presence of lime, which isolates the alkaloids, and of tannin, which assists in decolorising the liquids. This process, too long to be here described, greatly shortens the operation, and isolates purer products.

Such is the summary of M. Valser's paper. He has not feared to attack excessively delicate toxicological and chemical questions. Without diminishing the precision of Stas's process, he has, by extending it, rendered it applicable to the research of morphine. He has generalised a valuable reaction to isolate alkaloids by employing double iodide of mercury and potassium, which precipitate them so effectively. This reagent has demonstrated the presence of some vegetable bases in certain medicinal oils. He has besides discovered some new reactions for distinguishing the principal organic alkalies one from another. Then proceeding methodically, he utilised the valuable iodhydrargyrate of potash for the rigorous determination of the equivalent of alkaloids, rectifying some, changing others, all deduced from numerous correct and unexceptionable analyses, and finally crowned all by planning a general process for the estimation of all matters containing alkaloids.*—*Chem. News* from *Journal de Pharmacie et de Chimie*, xliii., 49, 63.

EXTRACT OF MALE FERN.

By W. E. Bowman, M. D.

The ethereal extract is the preparation of male fern usually employed for the expulsion of tape worm, and is the only one given in the new Pharmacopœia. It is, as often styled, the oil of male-fern; and is made by exhausting the root, by percolation with ether, which is afterwards distilled off, leaving a dark, oily liquid of the consistence of treacle. We have always been very successful with this extract, and generally prescribe for our patient two one drachm doses; directing the first to be taken in syrup or mucilage after a day's fast, and the second in three hours, with an ounce of castor oil. And if, on thorough search, the head cannot be discovered to have passed away with the evacuations, nothing but a little gruel is allowed, and the dose with the oil is repeated the next morning.

Beale in his work on the Microscope (p. 360) directs from two to four drachms as a dose; Pareira ($\frac{2}{65}$) says from 30 m. to a drachm; whilst Christison (496) gives but 18 m. at night, and a similar dose in the morning.

We have been led to this subject on reading some excellent remarks in the British Medical Journal, of the 9th of April, by Dr. J. D. Rendle, of Brixton, Surrey, which we here subjoin. It will be perceived that his mode does away with the most objectionable part of our treatment, namely, the fasting.

"In every case of tape-worm which I have treated for the last three years, the mode of preparing the patient, the dose of the male-fern, and the way in which it was given, have been the same; all of which I will now briefly describe. The patient is sent to the infirmary, and late in the evening on the day of

[* M. Valser does not notice the paper of Prof. F. F. Mayer, published in the Proceedings of the Amer. Pharm. Assoc., 1862, nor the extension of it in the American Journal of Pharmacy for January, 1863, where this process is practically applied by Prof. Mayer, in testing the preparations of Belladonna, Aconite and Stramonium, etc.—Ed. Am. Jour. Pharm.]

admission, the treatment is commenced by giving an ordinary two-ounce black draught; on the following day all solid food is forbidden, but an almost unlimited supply of beef tea is allowed; even milk, which is said to be the favorite food of the worm, I purposely forbid. On the evening of this day, half an ounce of castor oil is administered; and early on the following morning, about thirty-four hours after taking the black draught, two fluid-drachms of the oil of male-fern are given, suspended in two ounces of thin mucilage of acacia. The result, without an exception, in every case which I have thus treated, has been the expulsion of a dead worm within two hours after taking the remedy, and in one instance the worm was past in fifteen minutes.

"I have had no difficulty in getting the patients to submit to this mode of treatment, nor have they complained of hunger. In order, however, to enable them to bear without much discomfort the prolonged abstinence from solid food, the supply of good beef-tea has, as I have stated, not only been unlimited, but each patient has also been kept in bed during the whole of the treatment.

"The principle of this mode of treatment is, evidently, simply that of emptying the stomach and small intestines by abstaining from all solid food, and by purging; and so, by thus thoroughly uncovering the worm, exposing it to the full and almost immediate action of the remedy.

"I have never, in a single instance, given more than one dose of the drug before the parasite was expelled; nor has the two-drachm dose, given as I have mentioned, caused vomiting or troublesome purging; and in every case the worm was passed dead, and generally in one unbroken piece. No medicine of any kind is given except that which I have before mentioned; and, in a few hours after the worm is passed, the patients are restored to their ordinary diet.

"Before I was in the habit of preparing patients by the previous purging and abstinence which I have described, I generally found that the oil of male-fern failed as a remedy for the cases under consideration; but since I have adopted the mode of treatment which I now make public, I can say that I have never known it fail; and I cannot but feel certain that the remedy in question, if given as I have mentioned, will, invariably, first poison, and then quickly dislodge this troublesome parasite from the human body."—*Canada Lancet*, May 15, 1864.

ON SYRUP OF CHLOROFORM.

By Mr. T. B. Groves, F. C. S.

I presume, from the frequency of its use, that chlorodyne is at least a *convenient* preparation. Of its medicinal value I know nothing.

It was in attempting its preparation, with a view of satisfying myself as to its reported difficulty of accomplishment, that I met with the facts forming the purport of this communication.

It has been proved by experiment that chloroform is soluble in water to the extent of 2½ minims only per ounce, and that if a spirituous solution of chloroform containing a larger proportion than the above be added to water, the excess of chloroform soon finds its way to the bottom of the liquid, with which no amount of shaking will cause it to mingle sufficiently well to enable the dose to be accurately apportioned. This difficulty has been sought to be remedied in various ways. A Frenchman proposed a syrup of chloroform and glycerine, which he reported to have a marvellous aptitude to combine with water without decomposition. Mr. Squire, however, disposed of that fallacy as soon as it appeared.

Another form, also from a foreign source, consists of $\frac{1}{100}$ of chloroform dissolved in oil and then emulsed with gum and syrups—probably a good form for sole administration, but ill adapted for combinations.

It occurred to me that if chloroform were reduced to exactly the same specific gravity as the syrup employed, by the addition of a liquid lighter than itself, mixture once effected would be permanent; there could apparently be no tendency to separation if the theory admitted of being practically carried out. It was also obviously a *sine qua non* that the lighter liquid should not be liable to be abstracted by the syrup, or the chloroform would inevitably be precipitated in the globular form, as in the case of chloric ether.

I have succeeded in making such a mixture by reducing the specific gravity of the chloroform by means of ether, and shaking them with a definite amount of syrup. The chloroform manifests no tendency to separation, even when present in the proportion of one-eighth, but a better form is that containing one-twelfth.

The *modus operandi* is as follows:—Put into a twelve ounce bottle one ounce of chloroform and about three drachms of ether; to the mixture add the same volume of the syrup to be employed; observe carefully the disposition of the fluids, the chloroform and ether will probably sink, then add *guttatim* more ether until the two liquids, on being shaken together, appear indifferent as to their position in the system; finally fill up the bottle with the syrup, and shake well for a minute or two.

The syrup should not be too dense, or it will be difficult to impart to it sufficient agitation to ensure the complete commixture of the fluids. The syrup should be composed of gum and sugar, of honey or treacle; syrup of sugar does not answer well, apparently on account of lacking viscosity.

The syrup thus formed has the same physical properties as chlorodyne, and, like it, is readily miscible with water in any reasonable proportion (one to seven), and soluble in the water where the proportion of chloroform is within the limits of its solubility.

The advantages attending its use are these:—1st. It does not need special precaution when being added to watery fluids, it being at once diffused completely, and in no case does it give rise to a deposition of large globules of chloroform. 2d. When added in excess of saturation, the undissolved chloroform is deposited in *very minute globules*, which, after lying together for days, show no disposition to combine, but may by a few shakes be dispersed evenly through the liquid, forming an emulsion sufficiently permanent to enable a dose to be measured without difficulty.

I will conclude by proposing the following form for an anodyne containing chloroform (founded on one published by Dr.

Ogden), which will be found to remain combined and to mix readily with either spirit or water:

Take of Chloroform ʒiv.
Ether ʒiss.
Oil of Peppermint gtt. viij.
Resin of Cannabis gr. xvj.
Capsicum gr. ij.

Macerate for two or three days and filter. (No. 1).

Then take of Muriate of Morphia gr. xvj.
Hydrocyanic Acid Sch. ♏ xcvj.
Perchloric Acid.
Water *aa* ʒss.
Syrup of treacle (or honey), to make in all 4 oz.

Dissolve the muriate of morphia in about an ounce of syrup, to which has been added the perchloric acid and water, assisting solution by a water-bath, and when cold add the prussic acid.

Here, as it is absolutely necessary to preserve the relative proportions of these potent medicines, and also to include them in a given bulk, the manipulation is not so easy. It is only to be done, so it appears to me, by balancing separately the chloroformic tincture with the morphia syrup, and then again with a plain syrup to be used in making up the exact measure of the completed article. The balancing must be effected by adding water *guttatim* to a syrup denser than necessary. Then having ascertained by the balance the proportions required, quantities of the *same* materials, no matter how great, can at once be adapted for use without further trouble.

My chief object in giving the details of this process is to enable prescribers to devise for themselves, if they think fit, a form of the *exact* composition of which they are aware—an all-important requirement, one would imagine, where remedies of great potency are to be administered.—*London Pharm. Journ.*, June 1, 1864.

RESTORATION OF PICTURES.

Professor Pettenkofer, of Munich, who, it may be remembered, has invented a method for restoring pictures, has just patented his invention in this country. The nature of the process, which has been for some time an object of much speculation, is extremely simple, and is mechanical, not chemical. The change which takes place in pictures, he says, is "the discontinuance of molecular cohesion," which "process begins on the surface with microscopical fissures in the varnish, and penetrates by-and-by through the different coats of colors to the very foundation. The surface and body of such a picture become, in the course of time, intimately mixed with air, and reflect light like powdered glass, or loses its transparency like oil intimately mixed with water or air." The process consists in causing these molecules to re-unite, which he does as follows: The picture is exposed in a flat case, lined with metal, to an atmosphere saturated with vapor of alcohol at the ordinary temperature, which vapor is absorbed by the resinous particles of the picture to the point of saturation. The different separated molecules thus "re-acquire cohesion with each other, and the optical effect of the original is restored solely by self-action, the picture not getting touched at all." Other substances besides alcohol—such as wood-naphtha, ether, sulphuric and other ethers, turpentine, petroleum, benzine, &c.—may be used. The process seems to have been very successful at Munich, where Professor Pettenkofer restored some almost invisible pictures to very nearly their original freshness. Liebig has reported favorably on the method, and has given it as his opinion that it cannot injure the paintings, which, indeed, is almost a consequence of its extremely simple nature.—*Chem. News*, (London), June 18, 1864, from the *Reader*.

NOTE ON DISTILLED SULPHURIC ACID.

By Prof. Redwood.

The sulphuric acid of the British Pharmacopœia differs from that hitherto used in medicine in this country. We have been accustomed under the name of sulphuric acid to use commercial oil of vitriol, and this, according to the last London Pharmacopœia, was to have a specific gravity of 1·843. We are now directed in the British Pharmacopœia to use, not commercial oil of vitriol, but distilled sulphuric acid, and this is described as monohydrated sulphuric acid (HO,SO_3), the specific gravity of which is represented as 1·846.

Having had occasion in my lectures on the British Pharmacopœia to remark, with reference to sulphuric acid, that in the processes and descriptions given in that work there are some inconsistencies and errors, I have been called to account for making such a statement on what has been assumed to be insufficient grounds.

The subject is one on which I had worked a good deal some years ago, and my remarks were partly founded on results then obtained, and partly on the published investigations of others. I have since repeated some of the experiments to which I referred, and wish on one or two points to lay the results before the meeting.

Forty-eight fluid-ounces of commercial oil of vitriol, of sp. gr. 1843, were put into a small platinum still with one ounce of sulphate of ammonia, and the mixture submitted to fractional distillation. The first distillate, consisting of seven fluid ounces, was rejected. The three subsequent distilates, consisting of three fluid ounces, five and a half fluid ounces, and six and a half fluid ounces, had all very nearly the same specific gravity, ranging from 1841·3 to 1841·5. The next distillate, consisting of seven and a half fluid ounces, had a sp. gr. 1842·3, and the next, consisting of six fluid ounces, had a sp. gr. 1842·5. I observed that all these products had a slight smell of sulphurous acid, the production of which I could only account for by assuming that a portion of the sulphuric acid was decomposed in contact with the heated platinum vessel at the temperature required for the distillation. I ascribed to this decomposition the low specific gravity of the product as compared with what is indicated in the Pharmacopœia, and I therefore relinquished the further use of the platinum still.

Another operation was performed in a glass retort, as described in the Pharmacopœia. The specific gravity of the oil of vitriol operated upon in this case was 1844, this being the densest commercial oil of vitriol I was able to get. The process was conducted strictly according to the Pharmacopœia, the first ten fluid drachms being rejected, and then the product collected until one fluid ounce was left in the retort.

The distillate in this case was free from any smell of sulphurous acid. Its specific gravity was 1843. One fluid drachm (100·8 grains) of this acid was neutralized by 202 measures of the volumetric solution of soda, indicating that it contained more than one atom of water to the atom of anhydrous acid.—*London Pharm. Journ.*, June 1, 1864.

ON *MYROXYLON TOLUIFERUM*, AND THE MODE OF PROCURING THE BALSAM OF TOLU.

By John Weir.

Extracted from the Proceedings of the Royal Horticultural Society for May, 1864.

[Previous to his departure for New Grenada, Mr. Weir received instructions to make inquiries respecting certain interesting medicinal plants growing in that country, especially the *Balsam of Tolu* tree and *Sarsaparilla*, and to obtain, if possible, seeds and specimens. In accordance with these instructions, Mr. Weir has communicated the following interesting notice of his proceedings.]

From inquiries made during the voyage out, and immediately on landing in this country, I learn that a good deal of the Balsam of Tolu was brought down the river Magdalena annually to Barranquilla, whence it is exported to Europe. I therefore thought that the best way of reaching the country where the tree grows, was to go up the river to one of the ports I was informed the drug came from, where I hoped to be able to procure specimens and collect the desired information concerning it. At all events, I was told that by going to one of the ports on the lower Magdalena, I could cross the country to the valley of the Zinú quite as easily as I could reach the mouth of that river from Cartagena by sea.

Following up this plan, I took a passage to Mompox by the first steamer up the river, after my arrival at Barranquilla. On arriving at Mompox, I found that no balsam was gathered there (although I had been assured to the contrary in Barranquilla), and that the people generally did not know the tree; a negro was recommended to me, however, as having a wonderful knowledge of all kinds of "*hervas y remedios*," and who said he knew where some of the balsam-trees grew. With this man I started in a canoe for a place called Espiño, about three leagues distant from Mompox, and situated on the margin of one of the large swamps called "*ceinigas*," so common on the lower part of the river.

On reaching this place we entered the forest; and after having toiled through it for a couple of hours, during which I was gradually losing faith in the probity of my guide, he suddenly pointed out a tree which he assured me was the balsam-tree. This confirmed the opinion I had been forming—that he knew nothing about it, for the tree was certainly not a *Myroxylon*, nor anything like one.

I returned to Mompox in disgust. The gentleman who recommended the black was much disappointed on learning the result of our excursion, but said he had found another man, who would undertake to guide me to a place where the tree was to be found. I went with him a few days afterwards, but with no better success.

I have no doubt that the tree occurs within perhaps a day's journey of Mompox, but not in its immediate vicinity; for the ground, for leagues around that place, is low and swampy; indeed, it was nearly all under water when I arrived there, and I afterwards found that the tree is never found in the low tracks adjoining the river, but in the higher rolling ground beyond, where the soil is dry.

Finding that the tree was not known in Mompox, I left for Plato on the 17th December. Taking the steamer to Las Mercedes, I went from thence to Plato in a canoe. Las Mercedes is the port of El Carmen, and it consists only of a large storehouse for the tobacco brought from the interior, and the imported goods received in exchange. It was here I first saw the balsam. In the store were upwards of thirty tins full of it, ready for exportation; most of the tins contained ten pounds of the balsam, but there were also a few of a larger size, each containing an arroba of twenty-five pounds. The store-keeper told me that that lot of balsam had come from Plato only a day or two before, and that he expected some more that evening from the same place. The drug, he further informed me, was also exported from Teneriffe, Pinto, and Santa Anna, all small ports on the right bank of the river, but that most came from Plato. At Corozal, he said, none was now gathered, although the tree exists there, as also at El Carmen.

I was glad to find that I had got on the right track at last, and waited patiently for the canoe from Plato, by which I hoped to get a passage to that place. It arrived about six o'clock in the evening, started on its return an hour later, and by nine of the same day that I left Mompox, we were in Plato. This place is about a league further down the river than Las Mercedes, and on its opposide side, near the outlet of one of the numerous branch-streams the river forms in its course. Luckily for me, the "Jefe Municipale" of Plato, Frederico Alfaro by name, came in the canoe with me, and this man showed me much disinterested kindness during my stay there.

I had great difficulty in getting animals for the journey into the Montaña,—not a horse nor a mule was to be had, and it was only after waiting two days that I was able to hire two donkeys, one for my guide and the other for myself; a third for baggage I could not get,—and, indeed, it was considered quite unnecessary, as it is the usual custom here to travel on donkeys loaded with 80 or 90 lbs. of cargo besides the rider.

During the two days I had to wait at Plato, I found a species of *Myrospermum* growing plentifully in the neighborhood of the village, and gathered specimens of it both in flower and fruit. This I take to be *M. frutescens*, Jacq.: it grows to a height of about 15 or 20 feet. Some trees are now in flower, while on others the fruit is already of a good size. The trees bearing flowers or fruit are generally destitute of foliage, and it is only barren individuals that are in full leaf.

On the morning of the 21st, having got the donkeys and guide assembled and everything ready, we started for the Montaña. On one side of my own donkey was hung a bundle of paper and boards for drying specimens, and on the other my "estéra" (mat for sleeping on), blankets, mosquito net, and a for the journey and his own things. I started on foot, feeling change of clothes; that of the guide carried some provisions almost ashamed to mount an animal not much bigger than myself, which seemed to be already well loaded, but, before the day's journey was done, I had been glad to take occasional lifts on the poor donkey. We made about eighteen miles before we halted for the night, and my guide, a man twice my weight, rode every foot of the way. What with the burning sun, the thermometer at 89° in the shade, and the heavy load, I did not much envy his poor "burro."

We passed some balsam-trees in the afternoon, each with a lot of calabashes stuck on its trunk to catch the drug which trickled from the wounds in its bark. I picked up a few of the fruit under one of these trees, and on asking him what they were, he said they were "ojos de algo palo de la montaña." He did not know them, although he told me he had been accustomed to gather balsam since his boyhood.

Our second day's journey was not so long as the first,—I think not more than about twelve miles. The balsam-trees occurred occasionally during the whole way. We stopped at a hut in the forest surrounded by a small clearing, the owner of which, like all the inhabitants of the Montaña, makes part of his living by gathering balsam. The trees were very plentiful here, and generally of a large size. Their average height is about 70 feet, and the trunk is sometimes upwards of two feet in diameter a yard from the ground, and generally rises to a height of forty feet without branching, so that it is impossible to get at either foliage or fruit without cutting down the tree. On the day after our arrival, I got the man's permission to have a tree felled; he did not charge me anything for the tree, but stipulated that I should pay two of his sons a dollar each for felling it. I selected an old tree, nearly 2 feet in diameter. There was a sprinkling of pods upon it, but it was not by any means loaded. The pods are so loosely attached to the branches and so brittle in themselves, that nearly all of them were shaken from the tree and many broken to pieces by the shock of the fall. I found them to be approaching maturity, the seeds being fully developed, but, I am afraid, not ripe enough to grow. I had another smaller and more vigorous tree cut; the foliage of this was much larger than that of the older tree, and also a little different in form, but it bore no fruit. The specimens I send will sufficiently show the difference in the foliage of the two trees, and it is also sufficiently explained by the greater luxuriance of the younger.

As I have already said, it is impossible to reach the foliage of any of the trees unless by felling them; but I examined the leaflets of many trees from specimens picked up from the ground, but saw nothing to induce me to believe that the balsam is produced here by more than one species. The young trees have always larger foliage than the old ones; but the difference was constantly the same as it was in the individuals I had felled. The trees never make a very dense head of branches and foliage; but in the old ones, which have been much bled, it is very thin: many of the small twigs are dead, and the living ones are covered with lichens.

When a tree is about to be bled, two sloping notches are made in its trunk quite through the bark, and meeting in a sharp angle at their lower ends, leaving thus a point of bark between them untouched. The bark and wood is hollowed out a little immediately under this point, and the calabash cup is inserted under it. The process is repeated all over the trunk at close intervals, up as high as a man can reach; I have seen as many as twenty cups on a tree. The piece of bark and the cups I have sent, will show the process better than I can describe it. When the lower part of the trunk of a tree is too full of scars and wounds for any fresh cuts to be made, a rude scaffold is sometimes made round the tree, and a new series of notches made higher up.

From time to time, as may be necessary, the balsam gatherer goes round the trees with a pair of flask-shaped bags made of raw hide, slung over the back of a donkey. Into these bags the contents of the calabash cups are successively poured, and the cups are reinserted under the point of bark and left to be again filled. The balsam is sent down to the ports on the river in these hide bags, where it is transferred to the tins.

I could not learn which were the best months for the flowing of the balsam,—one person saying that it was in July, another in March, and so on, scarcely two agreeing; but the bleeding goes on during at least eight months of the year, from July to

March or April. When the balsam is flowing well, I was told that "one moon" sufficed to fill the cups.

Respecting the time of the flowering of the tree, individuals differed as widely as they did about the best time for the production of the balsam. I think I was told that it flowered in every month of the year, each person asked giving a different month; and several asserted that it did not flower at all.

I could not get any one to recognize the name "*Balsamo de concolito.*" I tried individuals with it at Cartagena, Barranquilla, Mompox, Las Mercedes, Plato, and the Montaña, but none of them knew what I meant. The balsam is certainly not known by that name at any of these places, but is always called *Balsamo de Tolu.**

I remained a couple of days in the Montaña, and returned to Plato. We travelled part of the way with a man going down to the port with a quantity of balsam: he had three donkeys loaded with it, each carrying four arrobas, or 100 lbs. weight. The quantities of the drug I saw on its way for exportation at Las Mercedes, Plato, and on the road from the Montaña, must have amounted to at least 1,500 lbs., which proves that the tree must be very plentifully scattered through the forest.

I returned to Mompox in a canoe, and arrived there on the 29th ult. On the 4th of the present month I left Mompox by the steamer up the river, and landed here on the 7th. This place is called Barranca Varmeija, and is situated on the river side, about two leagues further up than the place where the village of Bojorques formerly stood, for it is not now in existence, the river having carried all the houses away. This being the nearest point to Bojorques I could land at, I came here hoping to find *Smilax officinalis* H. B. K., but after several days' unsuccessful searching for it, I am afraid I must conclude it is not here; but I will go to Bojorques in another day or two, and perhaps I may find it there.

The Rhatany, I was told at Barranquilla, came from the neighborhood of Bucaramanga, and as I intend to go up the

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* "The balsam is not distinguished in this region [Carthagena] by the name of *Tolu,* but is known by the name of *Balsamo de concolito,—concolito* being the native name of the small calabash used for collecting it." —*Letter from the late Sutton Hayes to D. Hanbury, April 23d,* 1862.

river Sogamoza to that place when I leave Bojorques, I hope to be able to procure specimens of the plant that produces it there. —*Lond. Pharm. Journal, Aug.* 1, 1864.

Barranca Vermeija, on the River Magdalena, New Grenada,
January 13*th*, 1864.

POISONING BY DIGITALINE.

A very remarkable trial has lately taken place at Paris, in which a homœpathic physician, named La Pommerais, was charged with having poisoned a poor widow named Pauw, whom he had known for many years, and had attended her husband before his death, after which she became his mistress; and this connection continued till 1861, when it was broken off in consequence of Pommerais marrying a Madlle. Dubizy. The intimacy was renewed in July last, when he suggested that she should insure her life for £22,000, and that after the payment of the first premiums she should simulate illness, and then make a proposal to the insurance companies that her policies should be exchanged for a life annuity. The policies were effected in July for the above amount, at annual premiums of £750, and on the morning of the 17th of November the widow Pauw was found in great agony, and died in the evening. Dr. Gaudenat, who had been in attendance, certified that death was caused by a fall three months previously. Pommerais afterwards applied to the companies for payment of the money due upon the policies; but suspicions having arisen, a *post-mortem* examination was ordered, and hence the present trial. The *post-mortem* examination was made by MM. Tardieu and Roussin. No poison was discovered in the viscera, but there was an absence of disease in the internal organs. However, from the symptoms exhibited before death, and from experiments made on animals with the vomited matters scraped from the floor of the room occupied by the deceased, and with the contents of the stomach, they were of opinion that death had resulted from some powerful poison, probably digitaline. On the other side, it was contended that the experiments made with the matter scraped from the floor of the room were valueless, as it is impossible to say that organic matter in a state of decomposition might not have been sufficiently poisonous to cause the effects described. MM. Claude Barnard, Valpine, and Raynal were examined as to the action of digitaline on the heart, and described the experiments they had made with that substance. The jury found the prisoner guilty of poisoning the widow De Pauw. No mention of extenuating circumstances having been made, La Pommerais was condemned to death, and has since suffered the penalty.—*Lond. Pharm. Jour.*, *July*, 1864

ORIGIN OF GRAPHITE.

Report of M. Haidinger and others.

Iron, after remaining long buried in the earth, at last entirely decomposes, leaving a black, porous, eminently combustible residuum, known as graphite or pure carbon. M. Haidinger's report on the ferruginous masses of Kokitzan and Gotta, near Dresden, masses of uncertain origin, lends support to this general fact.

One word on the formation, still so little known, of graphite (plumbago pencil lead). The presence of graphite in granite gneiss and diorite, has renewed the disputes between the Neptunists and Plutonists. Graphite is well known to be nearly pure carbon, for it leaves in burning but a very small quantity of ash. Now, if these primitive crystalline rocks are of igneous formation, it is impossible to explain how graphite could co-exist with silicates of protoxide of iron without having reduced these salts. Judging merely by what takes place in blast furnaces, carbon reduces all oxides of iron at a high temperature. It must, then, be admitted that granite, gneiss and diorite did not contain graphite when the mineral elements of these rocks, such as mica, hornblende, and other ferrous silicates were in a state of fusion. Graphite, then must have been subsequently introduced into these rocks—but when, and how? Questions such as these are very difficult to answer satisfactorily. The most plausible hypothesis is that graphite has been introduced by the wet way into the crystalline rocks and substituted for one of the mineral components. Thus, in the gneiss of Passau (Bavaria), it takes the place of mica.

Graphite is frequently to be met with in granulated limestone—a fact particularly interesting to geologists. Is limestone a product of eruption, or is it a sediment transformed by the action of heat? The presence of graphite is explicable by neither hypothesis. For at a certain temperature, which need not be very high, carbon decomposes carbonate of lime. This salt may no doubt, under strong pressure, be heated to the melting point without losing its carbonic acid; this is a laboratory experiment often cited by the Plutonists. But it is quite a different thing with a mixture of carbon and carbonate of lime at a high temperature. If we reject the Neptunian origin of granulated limestone, we must then, as with crystalline rocks, suppose that graphite has been introduced by the wet way at a more recent period. The same remark applies to magnetic pyrites (sulphide of iron), often very rich in plumbago kerns.

Does graphite, like all carbon, belong to the organic kingdom? It is certain that anthracite, lignite, coal, are the result of the slow decomposition of an enormous quantity of vegetables; the impressions found on them often indicate the kind of vegetables, most of them extinct, which have contributed to these carbonaceous formations. Graphite, if not formed in precisely the same way as coal and anthracite, nevertheless bears signs of an organic origin. The formation of nuclei and veins of graphite in crystalline rocks is sufficiently explained by the decomposition of carbonized hydrogen gas at a high temperature; this gas, disengaged from organic matters, and penetrating the fissures of the burning rock, would undergo decomposition into hydrogen and carbon.

It is this deposited carbon which forms graphite. If in our laboratories we do not obtain exactly the same product, it must be remembered that Nature has means at her command which escape our researches. We find it impossible to make coal from wood. The wood may be carbonized by the dry or by the wet way. In the first place the carbonization is very rapid; in the latter it is extremely slow, as is shown by the blackened points of piling sunk in water.

Finally, graphite has been found in meteorites or areolites. Attempts have been made to explain its presence here by the continuance of these stones in soil more or less rich in carbonized principles. But with regard to newly-fallen stones, this explanation is inadmissible. If it be maintained that graphite is an organic product, it must be admitted that in the case of newly-fallen meteorites it can proceed only from organic matters belonging to another world than our own.

In his report on Alibert graphite, M. Dumas presents some considerations on the probable origin of graphite and of the diamond. M. Despretz and others ascribe to fire the change of carbon into diamond; Newton ascribed it to the coagulation of a fatty or oily body; Liebig says the diamond is slowly formed by processes which determine the prolonged putrefaction of a liquid body rich in carbon and in water; then, contrary to M. Despretz's method, a high temperature would be unfavorable to a successful attempt. Adopting Newton's hypothesis, M. Gœppert states, in "a memoir on the solid bodies entering into the composition of the diamond, and considered with regard to their organic or inorganic origin," that he is disposed to class the diamond among the products of the decomposition of organic matters. All these hypotheses M. Dumas rejects; according to him the diamond is crystallized carbon, at the moment of its production and in the midst of a mass which has been exposed merely to the heat necessary to soften it, provided this condition is sufficiently prolonged.

Finally, M. Dumas frankly admits that nothing positive is known as to the true origin of the diamond, though the substance most allied to it, silicum, is perfectly known, and very beautiful specimens of it are obtained.

However, it is positively ascertained that the diamond and graphite have not the same origin, and that the residue of every carboniferous substance, treated at a high temperature, proves to be but a variety of graphite. The new carbon found by M. Alibert in the mines of Marinski, situated at the summit of Batougol, on the Siberian frontiers, is, then, a graphitoid carbon of the most beautiful kind, formed by volcanic phenomena. M. Jaquelain, after carefully comparing the external characteristics of Alibert graphite with that obtained by his process, concludes that the conditions under which they are produced must be analogous.

In fact, on comparing the texture of the two carbons, they will be found sometimes of a metallic, mirror-like lustre; at another time the surface will be of shining steel-grey, mammilated as if it had been half fused, and had passed through a pasty stage. This appearance is similar to that of oxide of iron, nodulous brilliant, with mammilated surface, known by the name of brown hematite.

M. Jaquelain is inclined to admit that tarry and pyrogenated products, transformed in immense proportions into carbon and hydrogen, under the influence of igneous rocks, become accumulated in rents and excavations, causing an aggregation of carbon, and inducing a fusion analogous to that of carbon in retorts for lighting gas, and of graphitoid carbon destined to form the pencils used for the electric light.

On this point, M. Jaquelain narrates one of his own recent experiments. On decomposing some sulphide of carbon in a porcelain tube in presence of pure copper, heated to about 300°, sulphite of copper and graphite were formed, externally similar to natural graphite.—*Lond. Chem. News*, from *Cosmos*, pp. 720—725, 1864.

POISONOUS EFFECTS OF OIDIUM OF VINES.

We all know the destruction which the *oïdium* has caused among the vines for many years past, and, according to a communication made by M. Collin to the Academy of Medicine, it may determine in man all the symptoms of true poisoning. In the three cases which he relates, the persons while cutting vines affected with *oïdium* produced a slight incision of the skin; and in all the same symptoms resulted. In a few days, shivering, loss of appetite, and fever with remissions set in. The cut, at first quite insignificant, soon assumed a bad aspect, and eventually became gangrenous, the limb itself being œdematous. The most remarkable circumstance was that the mouth became covered with *muguet*, which modern researches have shown to be a cryptogamous production, and which has, indeed, been termed by M. Gubler the *oïdium* of the mouth. M. Collin has instituted some experiments by the inoculation of animals with *oïdium*, the results of which will be communicated.—*Med. News*, from *Med. Timez and Gaz.*, April 23, 1864.

A NEW METHOD OF PRODUCING ALDEHYDES.

By M. Carstanjin.

The different processes for preparing aldehydes consist essentially in—

1st. The oxidation of alcohols.

2d. The oxidation of nitrogenised matters, such as albumen, gelatine, &c.

3d. The dry distillation of salts from fatty acids.

4th. The same distillation conducted with that of the formiates of lime and baryta.

5th. The distillation of albuminoid substances.

6th. The dehydration of glycols.

On the strength of several observations, the author thinks himself justified in laying it down as a general fact that an aldehyde is always to be obtained by submitting an ammoniacal base to a proper oxidation. Among them is the acetic aldehyde $C_4H_4O_2$ rapidly developed when ethylamine is poured on crystallized permanganate of potash. At first violet, the liquid turns green, develops heat on shaking, becomes brown with effervescence, and finally evolves the aldehyde, so perceptible by its odor. The gas of the reaction passed into an ammoniacal solution of silver, promptly reduces it, forming a metallic silver mirror.

With methylamine he has obtained a strongly reducing gaseous compound like the above, and, like it, capable of forming a crystalline compound with ammonia. He has not analysed it, but believes it to be the hitherto unfound aldehyde of methyle.

With trimethylamine a compound is produced which the author believes to be identical or isomeric with propylamine.—*Chem. News, London, June* 4, 1864, from *Journal de Pharm. et de Chimie.*

NOTICE.

American Pharmaceutical Association.

The Twelfth Annual Meeting of the American Pharmaceutical Association will be held in the city of Cincinnati, Ohio, on Wednesday, the 21st day of September, 1864, at 3 o'clock, P. M.

The objects of the Association should by this time be well known to all Pharmaceutists, and are fully explained in the 1st Article of the Constitution, and conditions of membership in Article 2d.

From the well known character of the Chairmen of the various Standing Committees, able and interesting reports may be expected, and it is hoped that the attendance of the members and others interested in its objects will be large.

J. FARIS MOORE, *President.*

Baltimore, Aug. 10*th,* 1864.

Editorial Department.

Meeting of the Association—By the official notice above our readers will be reminded that the American Pharmaceutical Association will hold its Twelfth Annual Meeting at Cincinnati, Ohio, on the 21st of September, at 3 o'clock, P. M. In order to facilitate the Convention, we telegraphed to Cincinnati to get the location of the meeting in that city, and are informed by Mr. Wayne that the Committee have selected the Catholic Institute, on Vine street below Sixth, as being near the Hotels. Strangers, by applying at Mr. Gordon's store, at Central Avenue and 8th street, may get information relative to the meeting, and parcels or documents intended for the meeting will reach their destination directed to the President of the Amer. Pharm. Association, care of W. J. M. Gordon, as above. We are pleased to hear of the expected attendance of a number of prominent members from the Atlantic States, and, with some earnestness of purpose on the side of our western friends, the meeting may prove a decided success.

British Pharmaceutical Conference.—The Second Annual Meeting of this body will convene in the City of Bath, England, on the 14th of

September, (the same time and place with the British Association for the Advancement of Science, which commences its sittings on the 13th). Many of our readers will recollect that this body commenced its existence last year at New-Castle-upon-Tyne, in an endeavor on the part of several of the prominent Pharmaceutists of England to modify the existing relations between the pharmaceutical chemists and the chemists and druggists of that country, so as eventually to have but a single class. Some of those who sought this object believed that the tendency to centralization in the action of the Pharmaceutical Society, would be counteracted by having an Annual Meeting for scientific and professional purposes, which should be migratory in its character and which should be untrammelled by the material requisites of a local society. In fact, in many of its features the "Conference" is like our Association, and affords, like it, a middle ground where all interested in pharmacy may meet on equal terms and under circumstances eminently calculated to develope the professional feeling and talents of the members. Last year a series of subjects were accepted by members to be reported on at the ensuing meeting, and if only one half of them are acted upon, the profession must certainly be benefitted by the results. The "Conference" has our best wishes for a successful meeting and a continued existence of usefulness.

The Eighth French Pharmaceutical Congress was to have met on the 17th, 18th and 19th of August, at Strasburgh on the Rhine. The French Journals, in giving the notice of the meeting, state that the Railroad Companies have reduced the fare, for members in attendance for the occasion, to fifty per cent. of the normal charge. This is an arrangement that would add many members to our Cincinnati meeting, if it could be carried out with the Railroads here. We hope in due time to be able to chronicle some of the proceedings of this scientific body.

Bronze Statue of Vauquelin.—A movement is on foot at Paris to erect a bronze statue in honor of this eminent chemist, who was so closely connected with the progress of chemical science in France. The Committee embraces the names of Dumas, *Chairman*, Boullay, Frémy, Pelouze, Bussy, Guibourt, and many others; Guibourt acting as Treasurer. From the energy exhibited in bringing the subject to the attention of pharmaciens it is highly probable that the measure will be carried into effect.

The Schools of Pharmacy.—The season for special devotion to pharmaceutical study is rapidly approaching, and students begin to prepare the way for attendance at one or other of the Schools of Pharmacy. The attention of such and others is directed to the advertising sheet of this number for advertisements of the Schools.

CHLORODYNE. *Davenporte* vs. *Freeman.*—This empyrical preparation, which has been some years before the public, and a formula for which was copied into this Journal at vol. viii. page 181, has recently been the subject of litigation in London, where two persons claim the right of making the original Chlorodyne. The case was tried before Vice-Chancellor Sir W. Page Wood, on the 8th of July, and occupied three days. From the evidence it would appear that the recipe originated, so far as first bringing it before the public as invented by Dr. J. Collis Browne, by the plaintiff, Mr. Davenporte, whilst the defendant, Mr. Freeman, claims to have invented it before Browne, though he did not make it public, and hence felt entitled to use the prefix "original" as a trade mark. Neither party claim any patent right, and after a tedious hearing of evidence, the Chancellor decided to dismiss the bill, remarking that he considered the plaintiff as the original and true inventor of the compound, and reflected unfavorably on the unscrupulous conduct of the defendant and disapproved of his course. The whole affair reminds us of a similar case that occurred some years ago in this country, noted for its lucrative results to the lawyers; and when it is considered that the final question is merely whether the public shall be the more fleeced by Davenporte or by Freeman, in the sale of a nostrum, which no one can make by the published formula, there need be no regret at the result.

Memoranda on Poisons. By Thomas Hawkes Tanner, M. D., F. L. S., Assistant Physician for the diseases of women and children to Kings College Hospital, etc. From the last London Edition. Phila., Lindsay & Blakiston, 1864; pp. 112, 24mo.

This little volume, which may be carried in the pocket without inconvenience, embraces much information valuable to the practitioner in emergencies, and so condensed, clear, and well arranged as to be capable of rapid and easy consultation. About two-thirds of the book is devoted to the mineral poisons and the balance to organic poisons. The latter are treated of in greater variety than is usual in so small a work, as opium, prussic acid, chloroform, ether, alcohol, hyoscyamus, narcotic gases, strychnia, and strychnic drugs, belladonna, aconite, colchicum, digitalis, lobelia, ergot, conium, picrotoxin, and the bites of venomous reptiles.

The symptoms, treatment and postmortem appearances are given. Cases are occasionally introduced to illustrate the effects or the treatment. Although intended mainly for the physician, we believe this little book will prove useful to the apothecary, and should be kept on his shelf.

First Outlines of a Dictionary of Solubilities of Chemical Substances. By Frank H. Storer. Cambridge. Lever & Francis. 1864. *Part Third. Pp.* 256. *Royal octavo.*

It is with pleasure we receive the Third and concluding part of this valuable work from the publishers through the hands of Messrs. J. B. Lippincott & Co., of Philadelphia. We have already noticed the other two portions of this work, at pages 189 and 573 of the volume for 1863. This part includes the last portion of the extensive subject of metallic oxides proper, and continues to zirconium. Among the pharmaceutical subjects that particularly strike the reader are palmitin, paraffin, paratartaric acid, pectic acid, perchloric acid, phosphoric acid and the phosphates, phosphorus, picric acid and the picrates, picrotoxin, piperin, quinia, resins in great variety, salicin, sanguinarina, santonin, saponin, silicate of soda, starch, stearic acid, succinic acid, sugar, sulphuric acid, and the sulplates, the sulphites, sulphur, tartaric acid and the tartrates, valerianic acid, and the valerates. So far as examined, the author appears to have extended the same care to this part as to the others, and now that the work is completed, the whole forms a complete body of information in regard to solubilities nowhere else accessible to the chemist and apothecary in so compact and well arranged a form. Guelin's Handbook embraces a large portion of the facts of Storer; yet distributed over fifteen large volumes and without any key of arrangement, the facts are often inaccessible to even the possessor of the volumes. In adopting the title, "First Outlines," the author must have been fully aware of the difficulties of the task he had assumed, and that with all the labor he could put upon it, the result would, in numerous instances, necessarily be but an outline, owing to the lack of observations, or of observations sufficiently definite to afford positive information to the seeker. We believe, however, it was good policy in the author to include every substance he could find recorded, whether its solubility was known or not; so that in future revisions of his work, he can fill in new facts, the need of which he will be reminded by the unfilled blanks. In concluding this brief notice, we can repeat with pleasure what we have stated before, that Mr. Storer's work will prove very valuable to the apothecary and to the manufacturing chemist, who will find frequent need of it, and it should find a place among the useful works of reference in the shop and laboratory.

Suffolk Gold mining Company of Colorado; organized 1864 *under the laws of the Commonwealth of Massachusetts.* 100,000 *shares,* $5.00 *each. Works in Gregory District, Gilpin Co., Colorado. Treasurer's Office* 46 *Congress street, Boston.* Boston: 1864; pp. 67, octavo.

The above pamphlet of sixty-seven pages is an elegant specimen of Boston typography. The statements and illustrations of the pamphlet are plausible, and if the Company's metallic lodes prove as substantial as their paper and printing they will reap a rich return from their mining operations.

THE

AMERICAN JOURNAL OF PHARMACY.

NOVEMBER, 1864.

MINUTES OF THE TWELFTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1864.

The twelfth annual meeting of the American Pharmaceutical Association commenced its proceedings at the Hall of the Catholic Institute of Cincinnati, Cincinnati, on Wednesday, September 21st, 1864, at 3 o'clock P. M.

The President, Mr. J. Faris Moore, of Baltimore, Md., in the chair; H. N. Rittenhouse, of Philadelphia, acting as Secretary.

The Chair appointed a Committee on Credentials, composed of Messrs. Evan T. Ellis, of Philadelphia, H. W. Lincoln, of Boston, and A. P. Sharp, of Baltimore, who, upon examination, reported the following gentlemen as Delegates duly appointed to attend the present meeting:

From the Massachusetts College of Pharmacy.—Messrs. H. W. Lincoln, R. R. Kent, Charles A. Tufts, A. P. Melzar, Thomas Hollis.

From the Philadelphia College of Pharmacy.—Messrs. E. Parrish, Evan T. Ellis, Wm. Procter, Jr., Alfred B. Taylor, John M. Maisch.

From the Baltimore College of Pharmacy.—Messrs. J. B. Baxley, A. P. Sharp, J. Faris Moore, Wm. Caspari, H. A. Elliot.

From the Cincinnati College of Pharmacy.—Messrs. P. Reinlein, L. Groneweg, A. W. Fœrtmyer, O. Heineman, C. H. Bode.

The following gentlemen were reported as having been elected members since the last meeting, by the Executive Committee.

Thomas Jefferson Covell, Springfield, Ill.
Wm. Kent, Fort Dodge, Webster County, Iowa.
Joseph L. Parker, Fort Dodge, Webster County, Iowa.
R. C. Lineaweaver, Washington, D. C.
Francis P. Green, Bellefonte, Pa.
F. T. Maynard, California.
Hubert Primm, Carondolet, Mo.

The Committee presented the following names for membership:

Clayton N. Wills, Philadelphia, Pa.
Chas. F. Gristock, "
Samuel Campbell, "
George H. Ashton, "
Theodore St. Clair, "
William Ellis, "
Edward H. Buehler, "
Henry B. Morris, "
Geo. Edward Jeannot, "
Edward C. Jones, "
Wm. C. Bakes, "
S. Mason McCollin, "
John H. Winklemann, Baltimore, Md.
Joseph Y. Skinner, Baltimore, Md.
Thomas A. McConville, Worcester, Mass.
Erastus N. Champlin, Saratoga Springs, N. Y.
Geo. H. Fickhardt, Circleville, O.
Eugene Alex. Houston, Yonkers, N. Y,
Alfred J. Rankin, Pittsburg, Pa.
Simeon Johnston, "
Dr. F. Mahla, Chicago, Ill.
E. H. Sargent, "
Albert E. Ebert, "
James M. Mill, "
—— Bartlett, "
David Coggins, Lowell, Mass.
L. Groneweg, Cincinnati, O.
A. W. Foertmyer, "
John Keeshan, "
G. A. Hiller, "
F. A. Crowther, "
Alfred C. Hill, "
I. L. A. Greve, Cincinnati, O.
Samuel B. Allen, "
A. Wagner, "
H. F. Reum, "
A. Rutenick, "
E. Berghousen, "
A. Fennel, "
Ernst Kampfmueller, "
Chas. Kampfmueller, "
James W. Nadand, "
Uriah F. Shalter, "
E. Kunckel, "
George Merrell, "
Henry Gers, "
C. H. Bode, "
O. Heineman, "
Wm. Karrmann, "
E. W. Crowther, "
T. D. Wells, "
H. H. Hill, "
A. M. Johnston, "
James Markward, "
Wm. Tilley, "
A. Salpins, "
A. Langenbeck, "
L. Witzell, "
W. J. Fritsch, "
W. E. Reifsnider, "
John M. K. Walker, "
Hiram Maguire, "
W. H. Durkee, "
R. B. Oxley, "
Matthew Yoston, "
Michael Parr, "
S. L. Hayden, "
J. G. Fratz, "

A. Hottendorf, Cincinnati, O.
George Eger, "
S. B. Tomlinson, "
W. H. Klayer, "
Jos. H. Debolt, "
Griffith Rees, "
C. M. Helman, "
Otto Lippert, Cincinnati, O.
H. M. Merrill, "
Charles Foertmyer, "
Wm. Snyder, "
George W. Willcox, Columbia, Hamilton County, Ohio.
L. P. Stone, Newport, Ky.

A ballot being ordered, Messrs. A. J. Tully, of Cincinnati, and G. F. H. Markoe, of Boston, were appointed tellers, who reported the unanimous election of all the above-named candidates.

The roll being now called, the following members answered to their names:

A. S. Lane, Rochester, N. Y.
G. F. H. Markoe, Boston, Mass.
H. N. Rittenhouse, Phila., Pa.
Wm. B. Chapman, Cincinnati, O.
A. J. Tully, "
Wm. S. Merrell, "
W. J. M. Gordon, "
Robert R. Kent, Boston, Mass.
H. W. Lincoln, "
Evan T. Ellis, Philadelphia, Pa.
J. F. Moore, Baltimore, Md.
W. H. Adderly, Cincinnati, O.
A. B. Taylor, Philadelphia, Pa.
E. C. Jones, "
A. P. Sharp, Baltimore, Md.
P. Reinlein, Cincinnati, O.
L. Groneweg, "
A. W. Foertmyer, "
O. Heineman, "
C. H. Bode, "
Albert E. Ebert, Chicago, Ill.
Edward Berghausen, Cincinnati, O.
H. F. Reum, "
C. H. Foertmyer, "
G. H. Fickhardt, Circleville, O.

Mr. A. B. Taylor, Chairman of the Executive Committee, having read the report of said Committee, it was adopted.

REPORT OF THE EXECUTIVE COMMITTEE.

In accordance with the requirements of the Constitution, the Executive Committee presents the following Report of its action for the past year.

The volume of Proceedings of the Association, for 1863, was issued as early after the meeting in Baltimore as the proper revision and correction of the work, in the course of publication, and the private engagements of the Committee, would permit.

One thousand copies of the work were published; and, although the price of material and labor had very considerably advanced, it was thought best to use good paper for the volume, rather than to reduce the cost by using paper of inferior quality. The book was published in good style, and at a cost of $866 33, as will be seen by the following detailed statement of expenses:

Bill for composition and press work, (322 pages,)		$346 08
" paper,	(23 reams, @ $11,)	253 00
" binding,	(1,000 copies,)	220 00
" engraving and printing wood-cuts,		38 00
" incidental expenses,		9 25
		$866 33

While the expenses attending its distribution were as follows :

Bill for boxes and freight,	$11 05
" postage,	28 40
" incidental expenses,	2 57
Total expense of volume,	$908 35

These expenses have been paid by the Treasurer, leaving a balance in his hands, as will be seen by his Report. The Proceedings were distributed as usual, either by mail, or through a few members residing in the large cities. Any member entitled to a copy of the Proceedings, for 1863, who has been neglected in the distribution, will be supplied by sending his address to the Chairman of this Committee, Alfred B. Taylor, 1015 Chestnut Street, Philadelphia, and notifying him of the fact.

The stock of Proceedings stored in the Philadelphia College of Pharmacy is as follows :

For 1853,	234	copies,	unbound.
" 1854,	49	"	"
" 1855,	None,		
" 1856,	32	"	"
" 1857,	292	"	"
" "	35	"	bound.
" 1858,	293	"	unbound.
" "	46	"	bound.
" 1859,	90	"	"
" 1860,	225	"	"
" 1862,	350	"	"
" 1863,	254	"	"

This stock is exclusive of eighty volumes of various years, brought by the Executive Committee to Cincinnati. In addition to these volumes there are, no doubt, others remaining in the hands of parties in various sections of the country, to whom they have been sent for sale or distribution. It would, perhaps, be advisable for the Association to pass a resolution requesting all such copies, and all copies that may hereafter be sent for distribution, and remaining on hand at the time of our annual meeting, to be sent to the Chairman of the Executive Committee for the succeeding year, to be deposited by him along with the remainder of the stock. In view of the value of this gradually accumulating stock, it is suggested that it would be prudent to have it insured, and we recommend that the next Executive Committee be authorized to have such insurance affected.

Copies of the Proceedings were distributed to the leading public Libraries, and about fifty copies to foreign Societies, Libraries and individuals, through the Smithsonian Institute.

As has been seen above, a considerable number of volumes of this and of previous years remain on hand, and your Committee would suggest the propriety of members completing their sets of volumes as far as practicable. A large amount of money might thus be raised, and perhaps enough to publish the volumes which are now out of print. In consequence of the very great advance in prices, both of labor and material, your Committee is of opinion that, unless a corresponding advance be made in the revenue of the Association, it will be impossible to continue the publication of the Proceedings. It is hoped that means will be devised whereby this important end may be attained. We would suggest that the annual contribution of members be advanced to three dollars, and that the price of the Proceedings be raised to one dollar and a half per copy. We would also recommend that life members be charged with all copies of Proceedings they may hereafter receive.

Since our last meeting seven members have been elected by the Executive Committee; their names have been reported. The subject of prizes having engaged the attention of the Association for several years, and no practical plan having been adopted, the following suggestions are submitted for the consideration of the members.

It is proposed that two prizes be offered for Essays presented to the Association, to be awarded at the meeting subsequent to the one when such Essays are presented. The chief difficulty heretofore in offering prizes has been the want of funds, and to obviate this the following plan is suggested:

The prizes, and the persons to whom they shall be given, shall be decided by vote, any person being allowed to give as many votes as he pleases, for any candidate he may select, on the payment of 25 cents for each vote; the candidate receiving the highest number of votes to retain the first prize, not to exceed $50; and the candidate receiving the next highest vote to receive the second prize, not to exceed $25.

It is also proposed that a prize, not to exceed $25, be given to the person presenting to the Committee on Queries the best "Three Queries for investigation at a subsequent meeting of the Association." The merits of the Queries proposed to be decided upon by the aforesaid Committee.

Should the amount subscribed be insufficient to pay the above prizes, then the amount subscribed to be divided pro rata; that is, one-half for the first prize and one-fourth for each of the others.

In addition to the above, it is suggested that the Association have prepared the dies for an appropriate medal, and that medals be struck therefrom in gold, silver and bronze, one of each description to be awarded annually, to three persons respectively most deserving for general service and usefulness to the Association. The medals to be distributed by ballot of the members, on the last day of each Annual Meeting of the Association.

We would recommend that the Committees on Scientific Queries, on the Drug Market, and on Business, be made Standing Committees, since they are equally permanent and important with those now called Standing Committees. These Committees have grown into importance with the growth of the Association, (and no doubt the list will be hereafter further extended), and upon their action in a very large degree depends the interest and success of the Association.

This would involve a slight change in Article IV. of the Constitution, which now provides for the election of only two Standing Committees. Sections should be added, explaining and defining the duties of these Committees.

Before closing this report, the Committee is reminded of a sad duty it is called upon to perform. It is that of recording the names of members deceased since our last meeting.

During the past year, several of our associates have been taken from our midst: of such, the following names have been reported to the Committee:

Franklin Bache,	Philadelphia, Pa.
John Meakim,	New York, N. Y.
George W. Weyman,	Pittsburgh, Pa.

[As the death of all these Members has been noticed in this Journal except G. W. Weyman, we omit that part of the report relating to them.]

George W. Weyman was born in Pittsburgh, Pa., March 22d, 1832. He was placed in the Western University of Pennsylvania, at Pittsburgh, where his early education was sufficiently advanced, and from there went to Yale College in 1849, where he pursued his studies in the Chemical School until September, 1852. Early in the following year he went to Germany, and became a student in the Laboratories of Munich and Gottingen, taking the degree of Ph. D. On his return to the United States in 1856, he spent a short time with Prof. Silliman at Yale, and then repaired to his native city, to put into practice the store of useful knowledge he had acquired under such favorable circumstances. He opened a laboratory and Pharmaceutical store combined, in which he prosecuted the business successfully, until his life was termined by severe and rapid illness on the 16th of June, 1864. Dr. Weyman was much esteemed by the Members of this Association, which he joined in 1858, and of which, at the time of his death, he was one of the Vice Presidents. Cut off at 32 years of age, in the prime of his early manhood, his loss is deeply deplored by his associates and friends in the Association, and we tender to his relatives our sincere condolence.

In addition to the above list, the Committee has considered it a duty to record the death of one who, though not a member of this Association, was a careful observer of its progress, and felt a lively interest in its Proceedings, viz., Prof. R. P. Thomas, of Philadelphia.

The business next in order was to nominate officers for the ensuing year, but Delegates from some of the Colleges, who were known to be on the way, not having arrived, it was thought best to appoint a Committee, and leave the absent delegations to name candidates, when they arrive. The following gentlemen were appointed, accordingly, a Nominating Committee, agreeably to the Constitution.

H. W. Lincoln, Boston.
Wm. Procter, Jr., Philadelphia.
A. P. Sharp, Baltimore.
P. Reinlein, Cincinnati.
E. L. Massot, St. Louis.

To which were added by the President:

E. Parrish, Philadelphia
A. E. Ebert, Chicago.
Dr. E. R. Squibb, Brooklyn.

On motion of Evan T. Ellis, the Medical Profession were invited to be present at the meetings of the Association. Adopted.

The President then read his Annual Report.

ANNUAL REPORT OF THE PRESIDENT.

Gentlemen of the American Pharmaceutical Association :

The period has once more arrived which calls us together as an association of Pharmaceutists, for the advancement of the art and science of Pharmacy, and our own mutual improvement; and it becomes my pleasure, as well as my duty in compliance with a constitutional requirement, to address my associates.

The condition of our country, which has so distracted the public mind, and directed it from the pursuit of peaceful avocations and scientific research for the past three years, still continues; and the hope so fully indulged by all at our last meeting, that peace and unity would once more bless our country ere we were again assembled, has been disappointed. It is, however, with sincere gratitude to Him, who rules in war as well as in peace, that I congratulate you that you are enabled to meet in this beautiful city again to renew our associations, and pursue the useful and beneficial objects of our Convention.

The continuance of war materially affects the usefulness as well as the prosperity of the Association, by calling many of our best and ablest associates into other pursuits, and cutting us off from many of our brethren, who in former times met with and gave us their aid. Yet let us hope that before we again assemble, the blessings of peace may once more visit our land, and we may be permitted to meet with friends long separated from us, and enjoy all the benefits of association so long denied us. It is cause for congratulation that so many of our number are spared to lives of usefulness; yet in the providence of God we are called upon to mourn the absence of some bright names, whose presence we have enjoyed, and whose words we have listened to with pleasure for the last time, among which is that of the lamented Meakim. His absence leaves a void which time will scarcely fill. Yet it is with satisfaction that we can say, he has performed his part faithfully, whilst amongst us,—has finished his work, and passed to his reward in another world. I regret that my numerous engagements, apart from my regular occupation, have precluded the possibility of my communicating with the various Standing Committees, but from the known zeal and ability of the gentlemen composing the Committees, together with their Chairmen, I feel assured we will have able and interesting reports from all.

The report of the Treasurer on the financial condition of the Association for the past year, is highly gratifying: notwithstanding the increased expenses attending the publication of the Procedings and other incidental expenses, the funds have been sufficient for all expenditures, and leaves a large balance for the coming year.

The Treasurer in his report calls your attention to several subjects of importance, to which I would solicit your earnest attention. On examination of his books, it will be found that there are many enrolled as members, who have failed to pay their dues for a number of years. Some, indeed, who have not paid their first subscription, and several are now tendering their resignations.

I think the Association should take some action with regard to such cases, and would suggest that the Executive Committee be instructed to withhold the Proceedings from all members in arrears for more than three years. It is also desirable that the Treasurer should have some instructions as to the disposition he is to make of those tendering resignations whilst in arrears. Accompanying the report are several communications, which the Treasurer is desirous to lay before the meeting, that he may receive instructions as to the disposition to be made of them. In view of these circumstances, I would suggest that the whole subject be referred to the Executive Committee, or to an especial Committee appointed for that purpose to report at our next annual meeting.

I would again call the attention of the Association to the fact that the time is fast approaching when many of our members will, in compliance with the Constitution, cease to be Contributive Members. Some, indeed, are already entitled to Life Membership, and in view of the fact that the income will not more than meet necessary expenditure, it becomes a serious question whether we will be justified in depending solely upon new members for support. I would recommend the suggestion of our former President, Prof. Procter, that the Annual Subscription be reduced to *one dollar* after ten years' Membership.

I would call attention to the fact that the names of many Members are omitted from the list published in the last Proceedings, and would suggest a careful revision in the forthcoming volume.

In closing, permit me to call your attention to a subject which, although not within the direct sphere of our duties as an Association, is, I conceive, of vital importance to us as a profession.

This Association, in connection with the various Colleges, has already done much to raise the standard of our profession from mere dispensing apothecaries to their true position among kindred professions, and we already see a great advance in the character and attainments of the pharmaceutists. But the subject to which I would call the earnest attention of this Association, and through it the profession generally, is with regard to the requisite preliminary acquirements of those entering upon the study of Pharmacy.

We often find young men who, though apt at their manipulations, and possessing, perhaps, more than ordinary talents in other respects, most wofully deficient in their general education; and this is in many cases a drawback of no small importance to themselves, the profession and the community at large.

I should think means could be easily derived by which the standard of necessary education might be raised to such a height, as would be both beneficial and acceptable to all, and especially contributory to the dignity of the profession.

Pharmacy is, in the highest and most exalted acceptation of the word, a *science*. In that one word, whose real import and significance but few comprehend, are embraced a host of collateral branches of knowledge, the attainment of which are indispensable to him whose ambition aspires to the title of Pharmaceutist in its proper sense.

With the high appreciation of the honor conferred upon me, grateful for the kindness and indulgence extended toward me as President of this Association, and with the hope that in the providence of God we may all be enabled to meet again at our next annual meeting, I transfer to my successor a position which I sincerely hope he may be more capable of filling than myself.

J. Faris Moore, *President.*

It being impossible to proceed in business, on account of the absent delegations, it was moved and seconded that we adjourn, to meet to-morrow morning at 9 o'clock.

The meeting then adjourned.

Second Session—Thursday Morning.

The Association met at 10¼ o'clock A. M., the President in the Chair.

The Minutes of the previous meeting being read by the Secretary, on motion, were adopted.

The Roll being now called, the following members, additional to those of yesterday, answered to their names:

H. T. Kiersted, New York.
P. W. Bedford, “
John M. Maisch, Philadelphia.
R. H. Stabler, Alexandria, Va.
H. Haviland, New York.
F. T. Whitney, Mass.
G. Burrington.
W. Procter, Jr., Philadelphia.
Geo. C. Close, Brooklyn.
Fred. Stearns, Detroit.
E. W. Sackrider, Cleveland.
Theo. Kalbe, St. Louis.
Edwin R. Smith, Monmouth, Ill.
Eugene L. Massot, St. Louis.
Hubert Primm, “
E. R. Squibb, Brooklyn.
E. Parrish, Philadelphia.
E. S. Wayne, Cincinnati.
Enno Sander, St. Louis.
W. E. Reifsnider, Cincinnati.
Wm. Nadand, “
A. M. Johnson, “

The Committee on Credentials reported Messrs. Theo. Kalbe, Hubert Primm, Enno Sander, E. L. Massot, James McBride, as Delegates from the St. Louis Pharmaceutical Association: also, Messrs. H. T. Keirsted, G. C. Close, J. W. Shedden, F. F. Mayer, P. W. Bedford, as Delegates from the College of Pharmacy of New York.

The Executive Committee presented the following names for membership; a ballot being ordered, Messrs. G. F. H. Markoe, of Boston, and Edward C. Jones, of Philadelphia, acted as tellers, who reported them as duly elected:

A. Samson, Richmond, Ind.
D. B. Miller, Covington, Ky.
H. R. Miller, “
John T. Hanning, “
George J. McKay, Mount Vernon, Westchester County, N. Y.
Wm. S. Shuey, Springfield, O.
W. H. Crawford, St. Louis, Mo.
Alfred Mellor, Philadelphia.
Spencer O. Hatfield, Brooklyn N. Y.
Gilbert Long, Brooklyn, N. Y.
Sylvester M. Carle, “
Joseph Abel, Pittsburg, Pa.
Geo. A. Kelley, Allegheny, Pa.

The Committee on Nominations being ready to report, named the following gentlemen for Officers and Standing Committees for the ensuing year:

*For President.**

W. J. M. Gordon,	Cincinnati, Ohio
Fred. Stearns,	Detroit.
E. L. Massot,	St. Louis.

For Vice-Presidents.

First, Richard H. Stabler,	Alexandria, Va.
Second, Enno Sander,	St. Louis.
Third, Thomas Hollis,	Boston.

Treasurer.

J. B. Baxley,	Baltimore.

Recording Secretary.

H. N. Rittenhouse,	Philadelphia.

Corresponding Secretary.

P. W. Bedford,	New York.

Executive Committee.

John M. Maisch, *Chairman,*	Philadelphia.
Wm. Wright, Jr.,	New York.
W. H. Adderly,	Cincinnati, O.
H. A. Elliott,	Baltimore.
H. N. Rittenhouse, *Rec. Sec. Ex-Off.*	

Committee on Progress of Pharmacy.

Alfred B. Taylor, *Chairman,*	Philadelphia.
C. H. Bode,	Cincinnati.
Edwin R. Smith,	Monmouth, Ill.
E. H. Sargent,	Chicago, Ill.
P. W. Bedford, *Cor. Sec. Ex-Off.,*	New York.

Mr. Taylor declining to serve as Chairman, this Committee, on motion of Mr. Haviland, was referred back to the Nominating Committee, to report at the afternoon session.

A ballot being had for President, the tellers announced W. J. M. Gordon as having received four-fifths of the votes; when, on motion, the election of Mr. Gordon was declared unanimous.

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* The reason why three names were presented for President, was to do away with the precedent of electing a President from the city in which the Association met, as it might so happen that such a course would be inexpedient; and, besides, would always exclude worthy members from being candidates, from towns where the Association would not be likely to assemble.

The chair being now vacated by the retiring President, Mr. Gordon took his place with some very appropriate remarks.

On motion, the President was authorized to cast the ballot for the remaining Officers and Committees, upon which the tellers reported their election.

The Business Committee offered the following Resolutions, as Amendments to the Constitution, to come up at the next meeting of the Association for final adoption.

Notice to amend the Constitution.

Resolved, That Article III., Section I. of the Constitution be amended by inserting after the words " Who shall," the words " With the exception of the Recording Secretary." Section I. will then read as follows :

" Article III. Section 1st.—The officers shall be a President, two or more Vice-Presidents, a Recording Secretary, a Corresponding Secretary and a Treasurer, who shall, with the exception of the Recording Secretary, be elected annually, and shall hold office until an election of successors."

Resolved, That a new Section, to be called Section II., be introduced under Article III., as follows :—The Recording Secretary shall be elected to hold office permanently, during the pleasure of the Association ; shall receive from the Treasurer an annual salary of one hundred dollars, and the amount of his actual travelling expenses to and from the place of annual meeting, in addition to his salary.

Resolved, That the present Section II. be called Section III., and the numbering of the remaining Sections of Article III. be corrected in accordance with these Amendments.

Resolved, That Section IV. be amended by substituting after the words " received by the Association," the words " and shall be charged with editing, publishing and distributing the Proceedings of the Association, under the direction of the Executive Committee," for the remainder of this Section. The Section will then read as follows :

" The Recording Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve on file all reports, essays and papers of every description received by the Association, and shall be charged with editing, publishing and distributing the Proceedings of the Association, under the direction of the Executive Committee."

Resolved, That the subject of this Amendment be laid over for action at the early session of the next annual meeting of the Association, so that, if adopted, the Nominating Committee may act in accordance with the Amendment, in selecting a candidate for permanent Secretary.

The Treasurer's Report was now read by Mr. J. F. Moore, in the absence of the Treasurer, Mr. J. B. Baxley.

On motion, the Report was accepted.

TREASURER'S REPORT.

BALTIMORE, Sept., 15th, 1864.

To the Officers and Members of the American Pharmaceutical Association :—

It affords me pleasure to present the same healthful condition of the Treasury of the Association, as when I took charge of it one year since. Notwithstanding the increased expenditure incurred in publishing the Proceedings, yet the balance on hand is within forty-five dollars of what it was last year, and the Association free of debt.

I concur in the statement of the late Treasurer, viz: that our present financial prosperity "is owing to a large number of delinquent Members still coming forward and paying their arrears." There are many, however, as the accompanying letters will show, who repudiate their dues, and many more who do not deign to take any notice whatever of the frequent appeals of the Treasurer. This matter claims some action on the part of the Association. I have grave doubts, however, whether the proper time has yet arrived to agitate the subject. But in view of any action that may hereafter be taken, recommend that the Treasurer be instructed to make an alphabetical list of the entire Membership, and their standing with the Association, to be presented at the next Annual Meeting.

I am satisfied, from the frequent applications I receive for information on subjects that are recorded in the Constitution and By-Laws, that the Association should have that instrument printed in pamphlet form, and the Secretary be required in all cases to notify new Members of their election in writing, with a copy of the Constitution and By-Laws accompanying the notification. For the necessity of the above recommendation, I would refer to letter marked No. 11.

Several of the Members have called my attention to the fact of their names not appearing on the Roll of Membership, and one, that there is no evidence whatever of his election in any part of the printed Proceedings. Accompanying, I enclose a list of the names referred to above, marked No. 3. With many regrets that I am not able to meet the Association this year, I am very respectfully, &c.,

J. BROWN BAXLEY, *Treasurer.*

Gross receipts by Treasurer, $1381.44. Gross payments, $978.19. Balance in Treasury, $403.25.

On motion, a Committee was appointed to audit the Treasurer's Report. The Chair appointed Messrs. F. Stearns, J. F. Moore and H. Haviland, said Committee.

On motion, the Report of the Executive Committee was again read by Mr. A. B. Taylor, its Chairman, with the addition of an obituary notice of the late John Meakim, of New York ; the obituary was ordered to be incorporated in the Report, and the Report accepted.

Report of Committee on Progress of Pharmacy, in the absence of the Chairman, G. J. Scattergood, was presented by Mr. Procter, who read some extracts from it.

The Report was accepted, and ordered to be handed to the Executive Committee for publication.

Corresponding Secretary's Report was read by Mr. P. W. Bedford; the Secretary's Report was accepted and ordered to be published.

Second Session.

Report of Committee on Drug Market being next in order, was read by the Chairman, Mr. J. M. Maisch. On motion it was accepted and ordered to be published.

Report of Committee on Election of Members and Membership being in order, was read by Mr. E. Parrish. On motion it was accepted and ordered to be published.

On motion the meeting adjourned until 2½ o'clock this afternoon.

Adjourned.

Thursday afternoon—Third Session.

At 3 o'clock the President, W. J. M. Gordon, called the meeting to order.

The minutes of the morning session were read and accepted.

The Nominating Committee being ready to report presented the following as the Committee on Progress of Pharmacy:

J. F. Moore, Chairman, . .	Baltimore.
Lewis Dohme, ...	"
C. H. Bode, ...	Cincinnati.
E. R. Smith, ...	Monmouth, Ill.
P. W. Bedford, Cor. Sec., Ex-Off.,	New York.

The President cast the ballot as directed and declared them duly elected.

The Committee, appointed to audit the Treasurer's accounts, made the following report:

"The Committee, appointed to audit the Treasurer's accounts, have performed the duty assigned them, comparing the payments with the vouchers and find them correct. They find, however, an error in the footings, of ten dollars, to the credit of the Association, making the balance in the hands of the Treasurer $413.25."

F. Stearns,
J. F. Moore, } *Committee.*
H. Haviland,

Answers to the Scientific Queries, proposed at the last meeting, were now called for. They were read by Dr. Squibb, Chairman of the Business Committee, and the following answers elicited:

QUERY 1st.—Fermentation and cyptogamic vegetation viewed as destructive agents in connection with drugs and pharmaceutical preparations. What are the best means of avoiding the former, and arresting the growth of the latter without injury to the drugs and preparations?

Answered by G. J. Scattergood, by whom it was accepted, in a note to the Association, in which he states:

"In answer to Query No. 1, I desire to state that some attention has been paid to the subject, and experiments performed with a view of discovering the cause of fermentation in syrups, &c., and the means of preventing it, but from having been engaged in other service for the Association (unexpected at the time of accepting the Query), I have been unable to investigate the matter satisfactorily."

It was continued to him.

QUERY 2d.—Is there a practical process whereby Aloin may be easily extracted from commercial Aloes, so as to reduce the price of this principle in the market?

Not being replied to by Mr. P. W. Bedford, he made some remarks as to his investigation, which had not been satisfactory to himself, and it was referred to the Committee on Queries.

QUERY 3d.—Is there an eligible method, by means of which all the medicinal matter of Cinchona may be held in a permanent solution without deposition of cincho-tannates or cinchonic red?

Answered by Mr. A. B. Taylor; paper was referred to the Executive Committee. The preparation exhibited by Mr. Taylor was very handsome in appearance and elicited some discussion, the success being from the use of Glycerin as a solvent, in which its value in astringent extracts was looked upon as important.

QUERY 4th.—What is the best process for extracting lard so as to fit it for the purposes of pharmacy; and what the best means for preserving it for use during the summer and autumn?

Answered by Mr. H. W. Lincoln, of Boston.

Specimens being exhibited, the various processes used were discussed.

Query 5th.—What is the proportion of Camphor present in the officinal Aqua Camphoræ?

Answered by Mr. G. F. H. Markoe, of Boston.

This elicited considerable remark, in which the formula of the new British Pharmacopœia was alluded to.

Query 6th.—Does the Aqueous Extract prepared from Jalap, that has been previously exhausted by alcoholic process, have any medicinal properties, or does the alcoholic extract of Jalap fully represent its virtues?

Answered by Mr. A. B. Taylor, of Philadelphia.

Query 7th.—Does the volatile oil of Matico possess the power of stopping hæmorrhage, or does that property of the drug reside in some other ingredient or in the physical structure of the leaf?

Answered by a note from Mr. Higgins, who was unable to procure proper materials to operate with.

Query 8th.—On the pharmaceutist as a merchant, and on commercial education in relation to the successful prosecution of the pharmaceutic art?

Answered by Mr. F. Stearns, of Detroit.

Query 9th.—Stramonium is abundant in the United States, and its alkaloid Daturia is alleged to be identical with Atropia in Belladonna. If this be true, in what relative proportions do these plants contain this principle, and why may not Stramonium be used as a source of Atropia?

No reply was received from Mr. F. F. Mayer, by whom it was accepted.

Query 10th.—It is now known that Storax is a production of Liquidambar Orientale, a tree closely resembling L. styraciflua of the United States. It is also well known that our indigenous Liquidambar yields in warm latitudes a balsamic exudation, analogous to storax in odor and to tolu in consistence; and contains cinnamic and benzoic acids. Query.—Will this tree yield a product identical, or nearly so, with commercial storax, if it is treated in the same manner?

Partially answered by Professor Procter, who asked to have it continued to him another year.

On motion of Mr. A. B. Taylor it is ordered, that in all cases, where Queries were not answered or heard from at the time of meeting, they be continued another year to the same person.

Query 11th.—Is Nicotina the active principle in carefully dried green tobacco leaves? Do the seeds of tobacco contain the same alkaloid? and if so, does the proportion of nicotina found in commercial (fermented) tobacco justify the belief of Liebig (Agricultural Chemistry, Amer. ed., 184), that nicotina is an artificial product?

Answered by Professor Mayer, whose paper was read by Mr. Bedford, of New York.

Query 12th.—What is the best arrangement for spreading plasters of uniform sizes, rapidly and well; and what is the best form and weight of spatula for spreading plasters extemporaneously? together with observations on the dispensing of this form of preparations.

Answered by Mr. W. C. Bakes, of Philadelphia, who exhibited through Mr. Parrish, proper machines for the purpose.

Query 13th.—Bitter Wine of Iron. What is the best formula for this preparation, in which citrate or tartrate of iron is presented along with one or more bitter tonics and aromatics, combining efficiency as a chalybeate tonic with elegance and agreeability in appearance and taste; with comments on similar preparations now in use.

Answered by Mr. J. T. Shinn, of Philadelphia, in a paper presented and read by Mr. G. F. H. Markoe, who also presented some specimens of the Bitter Wine of Iron.

A discussion arose on the merits and characteristics of this article, in which Messrs. Markoe, Maisch, Procter and Parrish participated; Mr. Parrish maintaining that Bitter Wine of Iron is and should be a weak preparation of Iron.

Query 14.—Glycerin—its mission (so to speak) in Pharmacy as a remedy, as an adjuvant, and as a solvent.

Answered by Mr. W. J. M. Gordon, who showed samples of various preparations made with glycerin, instead of sugar, where sugar is required. This elicited considerable discussion, in which surprise was exhibited at the low price at which glycerin is produced, and the quality and mode of manufacture was alluded to.

Query 15th.—It has been stated that the poisonous properties of Rhus toxicodendron reside in a volatile alkaloid. Is this true? Is this alkaloid dissipated when the leaves are dried? Can it be isolated in a state fit for medical use, or can the properties of the leaves be preserved in some form as a pharmaceutical preparation?

Mr. Maisch, by whom this was accepted, asked to have it continued, which was granted.

QUERY 16th.—The leaves of Solidago odora possess the odor of anise. Are their medicinal properties due to a volatile oil, identical in composition with the oil of anise?

A letter was read by Mr. Taylor from Mr. Heinitsch, of Lancaster, Pa., giving a partial answer to the two queries which he accepted, viz. Nos. 16 and 18.

QUERY 17th.—The oil of Erigeron canadense is frequently employed in medicine for uterine hæmorrhage. Is its reputation deserved? Where is it chiefly produced? In what proportion does the herb yield oil? and what are its physical and chemical properties?

Not answered.

QUERY 18th.—The taste of Dittany (Cunila Mariana) is very like that of horse mint (Monarda punctata), Does the volatile oil of the former resemble that of the latter in physical and chemical properties?

See answer to No. 16.

QUERY 19th.—Spatulas, stirring-rods, agitators and mechanical stirrers used in pharmaceutical preparations; their material and quality, form and construction, with critical remarks.

Answered by Mr. T. S. Wiegand, of Philadelphia, whose paper was read by Prof. Procter.

Some pharmaceutical preparations were exhibited by W. J. M. Gordon & Brother, and called forth much commendation by the members.

On motion adjourned until 7½ o'clock.

Thursday Evening—Fourth Session.

At eight o'clock the President called the meeting to order.

The minutes of the last session having been read were, on motion, adopted.

A letter was received from Mr. Larz. Anderson offering to conduct the members of the Association through the extensive wine cellars of the late Mr. Longworth should they desire to visit them. On motion the letter was accepted.

The business of deciding upon a place of meeting for the Association next year being in order,

Mr. A. E. Ebert suggested Cincinnati.
" J. F. Moore " Baltimore.
" P. W. Bedford " Boston.

Dr. Squibb moved that the Association meet next year in

Boston. The motion was unanimously adopted. The time of meeting was added as an amendment which was accepted, and the time named as the first Tuesday in September next, at 3 o'clock, P. M.

Dr. Squibb read the following proposition of the President, That the Executive Committee be directed to withhold the volume of proceedings from all members who may be three years in arrears in their payments to the Treasurer.

A discussion of the above proposition was maintained by Messrs. Squibb, Bedford, Moore, Parrish and Markoe. Dr. Squibb read from Art. II., Section IV., of the Constitution, "that a member may lose his right of membership by neglecting to pay said contribution for three successive years." Mr. Moore offered as an amendment, "Notification being first given," which was accepted.

The resolution, as amended, was after much debate finally carried.

The Business Committee offered the following resolution:—

Resolved, That a Committee of two be appointed to examine the books of the Treasurer in regard to all arrearages, and to report to the next annual meeting the number and names of members who may be in arrears, the condition under which these arrearages may have occurred, and suggestions for the disposal of delinquent memberships. Adopted.

Messrs. Moore and Baxley (the Treasurer) were appointed said Committee.

The Business Committee offered the following resolution:—

Resolved, That members who may have received the volume of Proceedings and are in arrears with their annual dues to the Treasurer, and who may return his bills unpaid, or offer to resign with such arrearages unpaid, shall be expelled from the Association, and their dismissal or expulsion be published in the volume of Proceedings after the roll of members. Mr. Parish objected to publishing the names of members.

On motion the resolution was adopted.

The subject of Life Membership being introduced, it was proposed to charge $1 a year after ten years' Membership. Mr.

Taylor suggested that Life Members should not be annually assessed, but that they be charged for the Proceedings. Dr. Squibb suggested that the matter remain as it now is, allowing Life Members all their privileges, but should funds be wanted, raise the deficiency in some other way. On motion the whole subject of Life Membership was laid on the table. Carried.

It was recommended by the Executive Committee, that the Committee on the Drug Market, Scientific Queries and Business Committee, be made Standing Committees.

On motion the Business Committee were instructed to draw up an amendment to the Constitution making the above named Committees, Standing Committees. Carried.

In accordance with the recommendations of the Executive Committee, the following resolutions were adopted:

Resolved, That the Executive Committee be directed to value and insure all the property of the Association and present the bills for insurance annually to the Treasurer for payment. Adopted.

Resolved, That the Executive Committee be authorized to take such steps as the Chairman may deem best, to have all copies of the Proceedings, which may remain undistributed and unsold, returned to him by the next succeeding annual meeting, and present the bills of expenses incurred in effecting this to the Treasurer for payment. Adopted.

A motion to increase the dues of Members was rejected.

A motion that prizes be given by the Association, as suggested by the Executive Committee, was rejected.

Mr. Parrish gave notice that to-morrow morning he would offer a resolution abolishing the power of the Executive Committee to elect members during the interim, as provided by the Constitution, Art II., Section 2.

Mr. Parrish spoke to the effect that the suggestions of the Committee on Membership, as applied to the acquirements and election of candidates, be adopted. Mr. Haviland opposed it. Much discussion was had on this subject, but the suggestions were finally rejected.

Committee on Membership recommended a new form of Certificate of Membership. On motion a Committee of three were appointed to get up a new certificate. The chair appointed Messrs. A. B. Taylor, J. T. Shinn and Evan T. Ellis a Committee.

Committee on Scientific Queries presented the following for solution:

QUERY 1st—The seeds of Cimicifuga Racemosa are numerous and easily obtainable. What are their characteristics, properties and chemical constituents?

Accepted by E. D. Jones.

QUERY 2d,—Gillenia Trifoliata and Stipulacea are found extensively diffused throughout the United States. Their roots are known to resemble Ipecacuanha in medical properties. Could they be made to substitute that costly drug, and would Fluid Extract, Wine and Syrup of Gillenia be available for use as substitutes for the corresponding preparations of Ipecacuanha.

Accepted by Albert E. Ebert.

QUERY 3d.—The Salts of Sanguinarina are employed to a considerable extent in some of the western cities. How do they compare with the Galenical preparations of the root, and what are their best combinations and modes of administration?

Accepted by Prof. R. Barthalow.

QUERY 4th.—Which process for Camphor Water is to be preferred, that of the U. S. Pharmacopœia or of the British Pharmacopœia?

Accepted by George F. H. Markoe.

QUERY 5th.—Could the Poppy be profitably cultivated in any part of the United States, for the production of Opium and Poppy Seed Oil?

Accepted by Edwin R. Smith.

QUERY 6th.—Can Citric Acid be profitably produced in this country, from Currants, Goosberries or Tomatoes?

Accepted by H. N. Rittenhouse.

QUERY 7th.—Can Peach Kernels be profitably used to procure the fixed and volatile Oil of Almonds?

Accepted by E. S. Wayne.

QUERY 8th.—Commercial Honey is much adulterated with or substituted by artificially prepared Syrup. How can the fraud be detected?

Accepted by E. S. Wayne.

QUERY 9th.—What is the best strength of Alcohol for the extraction of the several officinal Gum Resins, with a view to the production of eligible liquid representatives of the drugs.

Accepted by P. W. Bedford.

QUERY 10th.—A good permanent preparation of Pumpkin Seeds, (Pepo,

U. S. P.,) is a desideratum, with a view to its convenient use as a Tænifuge remedy. What is the best, with a formula?

Accepted by J. S. Higgins.

QUERY 11th.—What is the most convenient form of apparatus adapted to common use, for regulating the temperature at or below 160°, 140°, and 120° respectively, as directed in the evaporation of some of the officinal extracts?

Accepted by P. W. Bedford.

QUERY 12th.—What are the causes of the decomposition of the Syrups and other Vegetable solutions, the best precautions to prevent it, and the best means of restoring such preparations which have deteriorated?

Accepted by E. S. Wayne.

QUERY 13th.—In what preparations may Glycerin be used to prevent the deposition of apotheme? What is the minimum quantity that will answer the purpose, and will such preparations bear dilution?

Accepted by A. B. Taylor.

QUERY 14th.—How far is Glycerin capable of substituting Alcohol in extracting drugs for pharmaceutical preparations? Would such substitution be economical?

Accepted by W. J. M. Gordon.

QUERY 15th.—Is the cultivated Valerian, produced in New England, of equal quality with that imported from England and Germany, and are there any characteristic differences by which they may be distinguished?

Accepted by G. F. H. Markoe.

QUERY 16th.—The so-called Naphtha or Benzine derived from the rectification of coal oil is very variable in properties. How far do these properties fit it for use in Pharmacy, and what are the relations, if any, of specific gravity and solubility among these hydro-carbons?

Accepted by A. P. Sharp.

QUERY 17th.—What indigenous articles of the Materia Medica can be properly and profitably cultivated?

Accepted by W. G. Merrill.

There being now no especial business before the meeting the answers to queries, proposed at the last meeting, were called for, and the reading of such as had been answered proceeded with.

QUERY 20th.—What are the best vessels in which to dispense ointments and cerates, combining fitness with elegance and accuracy; and what is the best plan for keeping this class of preparations in the dispensing shop, so as to retard their tendency to oxidation?

Mr. Thompson, of Baltimore, explained by letter why he had not answered this query. On motion it was continued to him.

QUERY 21st.—Maruta cotula and Leucanthemum vulgare are exten sively introduced into the United States; can their flowers, as has been repeatedly asserted, be made available for destroying insects, and may they be regarded as a substitute for the so-called "Persian Insect Powder," which is derived from the nearly allied genus Pyrethrum?

Partially answered by Mr. G. F. H. Markoe, who presented some dried specimens of the plant. Mr. Markoe asked to have the same subject continued to him another year, which was granted.

QUERY 22d.—Pumpkin seeds have acquired some reputation as a remedy in tænia. Does their curative power reside solely in a fixed oil?—if so, what is the best process of extracting it, and of dispensing it for internal use?

Mr. C. A. Tufts, of Dover, N. H., who accepted this query, informed the Association that he had had no opportunity of trying any experiments, and asked to have the subject continued, which was granted.

QUERY 23d.—An essay on gas-heating apparatus adapted to the various purposes of the apothecary, so as to enable him to conduct his processes in or near the shop; which shall combine efficiency with economy; illustrated by figures or specimens.

Mr. Bedford, of New York, asked to have this subject continued to him, as he had been unable to finish his investigations in time for this meeting.

QUERY 24th.—Valerianate of Ammonia. The crystalline salt made by the process of B. J. Crew is apt to have adhering valerianic acid, which renders it disagreeably odorous and moist, What is the best means of obtaining a dry, neutral salt?

No answer was received from Mr. Bullock, to whom it was referred, in reply to this question, but he explained through Mr. Bedford why he had not answered it. This query was dropped.

QUERY 25th.—What is the best formula for Elixir of Valerianate of Ammonia, which shall be nearly free from valerianic odor and elegantly aromatized?

Continued to Mr. J. Roberts, of Baltimore, by whom it was accepted.

QUERY 26th.—Is there a reliable test for the active resin from Cannabis sativa of the East Indies, whereby the genuineness of Extract of Indian Hemp may be satisfactorily and easily ascertained by the pharmaceutist?

Replied to by Mr. Procter, at length, in a paper read by him.

Query 27th.—What is the best kind of press for the pharmaceutical laboratory, on a moderate scale, combining great power with simplicity and easy manipulation? and can the principle of the hydraulic press be employed?

Mr. R. H. Stabler, of Alexandria, Va., who accepted this query, replied to it in an excellent paper, and illustrated the subject with elaborate drawings.

The reading of answers to these queries called forth an animated discussion, rendering the meeting one of great interest.

An invitation having been received from Dr. O. M. Langdon, in charge of the Longview Insane Asylum, near Cincinnati, to visit that Institution, it was on motion accepted, and a proposition to leave this Hall to morrow morning at 11 o'clock, in conveyances provided by the Cincinnati College of Pharmacy, was agreed to.

It now being 11 o'clock, on motion adjourned until 8½ o'clock to-morrow morning.

Adjourned.

Friday—Fifth Session.

At 8½ o'clock the President called the meeting to order. Minutes of the previous session, having been read and corrected, were adopted.

The subject of Amendments to the Constitution was introduced as unfinished business.

Dr. Squibb, from the Business Committe, introduced the following proposed amendment, relating to the duties of the Committee on the Drug Market, as Section 4th, Article IV., of the Constitution.

Section 4th.—The Committee on the Drug Market shall report annually the fluctuations in the supply and demand of imported Drugs, the variations in quality, and the adulterations and sophistications coming under their observation or reported to them by others; and they shall be authorized to report upon any adulterations and sophistications of immediate interest, through the Pharmaceutical journals, as soon as practicable after their discovery.

On motion this amendment was adopted.

Dr. Squibb of the Business Committee was requested to read separately certain Sections of the Constitution as it now is, and the proposed amendments, which are as follows:

Article II., Section 2d. Omit the words:

"Should an application occur in the recess" and all that follows them to the end of the Section.

The Amendment, on motion, was adopted.

Article IV., Section 2d, fourth line, omit the words, "the election of members in the recess."

The Amendment, on motion, was adopted.

Article IV., Section 3d, Omit all the words, "in this country or in Europe."

The Amendment, on motion, was adopted.

Resolved, that Article IV. of the Constitution be amended to read as follows:

Section 1st. There shall be five Standing Committees elected annually: an Executive Committee—a Committee on the Progress of Pharmacy—a Committee on the Drug Market, each to consist of five members; a Committee on Scientific Queries, and a Business Committee, each to consist of three members.

On motion this amendment was adopted.

Section 5th. The Committee on Scientific Queries shall report near the close of each Annual Meeting a proper number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation, and report before the next succeeding Annual Meeting, as may be practicable.

On motion the amendment was adopted.

Section 6th. The Business Committee shall be charged with the transmission of unfinished business from one Annual Meeting to another, and with collecting, arranging and expediting the business throughout the various sessions of the Annual Meetings.

On motion the amendment was adopted.

Mr. Parrish now proposed that all of the above resolutions be laid on the table, but after some discussion withdrew his proposition, and the above changes and additions were adopted as a whole.

The resolution passed at the fourth session withholding the Proceedings from those in arrears, being in conflict with the Constitution, was objected to by Mr. Parrish, but was not sustained. On motion of Mr. Moore the resolution was re-considered, and laid on table.

Objections were here made by Mr. Primm of Carondalet to the unparliamentary manner of conducting business of the meetings of the Association; the objections were answered by Dr. Squibb, and sustained by the Chair.

On motion, the resolution passed at the fourth session, relating to the expulsion of members in arrears, who return the Treasurer's bills unpaid, or attempt to resign after having received the current volume of Proceedings, &c., was re-considered, and laid on the table.

On motion, three more names were recommended to be added to the Committee, to examine the Treasurer's Books.

Motion was lost.

The following letter was received from Mr. Henry Sweet, Secretary of the Chicago College of Pharmacy:

CHICAGO COLLEGE OF PHARMACY,
CHICAGO, Sept., 21st, 1864.

To the Members of the American Pharmaceutical Association:
Gentlemen:

At a meeting of this College, held Sept. 5th inst., it was unanimously voted, that your Association be invited to convene its next Annual Meeting in the rooms of the College of Pharmacy in this city.

In view of the great impulse which would be given thereby to Pharmaceutical interests in the north-west, and the manifold and mutual advantages arising therefrom, we would urge your acceptance of this invitation.

(Signed,) HENRY SWEET,
Secretary.

It was moved by the Business Committee, "That the invitation of the Chicago College of Pharmacy be received with thanks of the Association, and that the Corresponding Secretary be directed to transmit to that College the explanation, that it was deemed not advisable to have two successive meetings in the Western States."

The motion was adopted.

Mr. Edwin R. Smith presented his credentials as a Delegate from the Chicago College of Pharmacy, and explained how it occurred that the letter of the Chicago College was so late in reaching the Association.

The reading of the Queries proposed at the last Annual Meeting, and their answers, was now resumed.

Query No. 28.—Pure Tannic Acid being an odorless substance, is there an odorous substance in nutgalls that is found adhering to commercial Tannic acid? or is the odor very commonly noticed in that substance due to impure ether used in its preparation?

Answered by Mr. Procter.

Query No. 29.—Owing to the proverbial difficulty in keeping garlic from growing and drying up to its detriment, and to the fact that garlic may be prepared so as to keep like other drugs, by the destruction of the vitality of the bulblets and their partial desiccation, it is queried: Can the latter process be advantageously applied to the commercial drug? and if so how is it effected?

Answered by Mr. A. P. Sharp, of Baltimore.

Query 30th.—What course should be adopted by Pharmaceutists, in view of the present state of the liquor market, as regards factitious Brandies and Wines?

Referred by vote of Association to Edward Parrish, who answered in a paper read by him.

The following Queries having been carried over from a previous meeting of the Association, were disposed of as follows:

Query 1st.—Is there a principle in Chenopodium Anthelminticum analagous to Santonin? or does the medicinal power of this plant depend wholly upon its volatile oil?

No answer was received from Mr. Balmer, of Baltimore, to whom it was continued.

Query 2d.—Is there a crystalline active principle in Capsicum, or does it owe its pungency to a soft resin?

Answered by Mr. Parrish.

Query 3d.—What is the best permanent solvent for Cantharidin, suitable for making a pharmaceutical preparation for blistering?

No answer from Mr. J. F. Moore, to whom it had been continued, being received, the query was dropped.

Query 4th.—Has Propylamin, as it exists in Ergot, any power to produce uterine contraction? and if so, does commercial Propylamin, from herring pickle, possess a like power?

Continued to Dr. R. P. Thomas, not answered, Dr. Thomas deceased.

QUERY 5th,—What is the most convenient and economical arrangement by which the Apothecary can quickly and reliably ascertain the strength of Acid and Alkaline Liquids for pharmaceutical purposes?

Continued to Dr. W. H. Pile, of Philadelphia, but not answered.

QUERY 6th.—Is the process of Dialysis applicable in Pharmacy? if so, in what instances may it be employed?

Continued to Mr. Procter, and answered by him.

QUERY 7.—What are the methods of detecting the adulterations of Olive Oil?

Continued to Mr. Winter, of Baltimore, but no answer was received.

A paper on Southern Prickly Ash Bark, by Prof. R. Bridges, was presented in answer of a query referred to the late Prof. R. P. Thomas, in 1862, and on motion was referred to the Executive Committee, for publication: and the thanks of the Association were tendered to Prof. Bridges.

A volunteer paper was presented by Mr. T. S. Wiegand, on a Balance for the Apothecary; as also the following from Mr. Maisch:

On Observations on Oleum Æthereum,
" Quality of Sherry Wine,
" French Brandy and Whisky,
" Manufactures of the U. S. Laboratory,
" Some Medicinal Spirits;

also a paper from Prof. Parrish, on his method of teaching Practical Pharmacy.

On motion of the Business Committee, the following resolution was adopted:

That the papers voluntarily contributed to this meeting of the Association, be referred to a Committee of two members, who shall examine these papers and forward them to the Executive Committee, with a concise report, giving the reasons why they should or should not be published in the Proceedings; and that the Executive Committee be guided in their publication by this report, the report to be also published.

On motion, the President appointed Dr. E. R. Squibb and Prof. F. F. Mayer as this committee.

All the papers read were also referred to the Executive Committee for publication.

Mr. Parrish called the attention of members to a new style of scales for Apothecaries' use, arranged so as to dispense with weights. The weight of the article weighed was read off on a graduated scale, containing both avoirdupois and Troy denominations. The Executive Committee were ordered to have a drawing made for publication in the Proceedings.

On motion of the Business Committee it was *Resolved*, That the thanks of this Association be tendered to Mr. Larz. Anderson, and Dr. O. M. Langdon, for their kind invitations to visit the establishments over which they preside, and that the Corresponding Secretary be directed to carry into effect this resolution.

Resolved, That the thanks of the Association be tendered to the Cincinnati College of Pharmacy, for the attention and hospitality shown to the Association at this meeting.

The following Committees were announced by the Chair for the ensuing year:

Committee on Scientific Queries.—Wm. Procter, Jr., Chairman, Philadelphia; E. S. Wayne, Cincinnati; F. Stearns, Detroit; R. H. Stabler, Alexandria, Va.

Committee on Drug Market.—F. F. Mayer, New York, Chairman; W. S. Thompson, Baltimore; S. M. Colcord, Boston; E. L. Massot, St. Louis; Fred. Stearns, Detroit.

Business Committee.—E. R. Squibb, Brooklyn, Chairman; Robert R. Kent, Boston; George C. Close, Brooklyn.

On motion of Mr. Primm, of Carondolet, Mo., the following resolution was adopted:

Resolved, That the thanks of this Association are hereby tendered to the President, Secretary, Treasurer, and retiring Officers, for the able manner in which they have discharged the duties of their respective offices.

The minutes of all the previous sessions having been read, they were unanimously adopted.

On motion, the Association adjourned.

HENRY N. RITTENHOUSE, *Rec. Sec.*

At a meeting of the members who visited Longview Asylum, near Cincinnati, the following resolution of thanks was unanimously adopted:

Resolved, By the members of the American Pharmaceutical Association, and their friends of both sexes, assembled at Longview Asylum on this anniversary occasion, that we extend to Dr. Oliver M. Langdon, and the Steward and Matron of the Asylum, our cordial acknowledgments for their generous hospitality, and shall carry to our distant homes a lively recollection of the Institution and its Officers.

SUBSITUTES FOR INDIAN INK.

A substance much of the same nature and applicable to the same purposes as Indian ink may be formed in the following manner:—Take of isinglass three ounces: make it into a size by dissolving over the fire in six ounces of soft water. Take then Spanish liquorice one ounce, dissolve it in two ounces of soft water over the fire in another vessel, then grind up on a slab with a heavy muller one ounce of ivory black with the Spanish liquorice mixture. Then add the same to the isinglass size while hot, and stir well together till thoroughly incorporated. Evaporate away the water, and then cast the remaining composition into a leaden mould slightly oiled, or make it up in any other convenient way. This composition will be found quite as good as the genuine article. The isinglass size mixed with the colors work well with the brush. The liquorice renders it easily dissolveable, on the rubbing up, with water, to which the isinglass alone would be somewhat reluctant; it also prevents it cracking and peeling off from the ground on which it is laid. A good Indian ink may be made from the fine soot from the flame of a lamp or candle received and collected by holding a plate over it. Mix this with the size of parchment, and it will be found to give a good deep color. Burnt rice has been by some considered a principal ingredient in the genuine Indian ink, with the addition of perfumes or other substances not essential to its qualities as an ink. —*Chemical News,* from *British Journal of Photography.*

"REPORT OF THE WEIGHTS AND MEASURES USED IN PHARMACY.

By Mr. Barnard S. Proctor.

[*Abstract.*]

"The author first made a comparison of the apothecaries' weights of our country with those of other civilized nations. Though there are forty different European pounds and as many ounces in general use, there were only two or three systems of pharmaceutical weights, and these not widely differing from each other. The English system, though good in the abstract, had no simple relation to the systems of other countries, nor to the other weights and measures of this country. Some of its own members were in an anomalous position. What was a fluid pound of apothecaries' weight? Was it 12 avoirdupois ounces, 12 troy ounces, or 16 avoirdupois ounces? A critical examination was then made of several suggested alterations in the weights and measures of pharmacy, those of Mr. Jacob Bell, Mr. Griffin, Dr. C. Wilson, and Mr. Warington, being especially noticed. The advantages and disadvantages of the weights and measures authorized by the Medical Council in the new Pharmacopœia were next reviewed, and a suggestion made that the ounce of that system should be divided into drachms and scruples. To get rid of the fractions of a grain, which would otherwise be appended to these drachms and scruples, the author proposed that the value of the grain should be slightly increased; so that, instead of 18·229 grains being contained in one scruple, there should be only 18; instead of 54·687 in the drachm, there should be but 54; and 432 in the ounce, instead of, as now, 437·5. This was as near an approach to an amalgamation of the troy and apothecaries' system as he could devise. The elaborate and ambitious system proposed by the American Pharmaceutical Association was next noticed, and then the French metrical system, the merits and demerits of all under various circumstances being carefully weighed. For ultimate general adoption the author thought the American octonary system to be superior to the metric decimal system; that, in short, doubling and halving a number was better than multiplying or dividing by ten. He concluded by proposing the use of the American system, modified to meet the requirements and customs of the English."—*Proc. Brit. Pharm. Conf.*

THE MORPHIA SALTS OF COMMERCE.

By Mr. W. E. Heathfield.*

The inquiries of the author had been directed to the amount of moisture existing in these salts, and also to the question as to whether codeia was present in them.

Three samples of hydrochlorate from different manufacturers had been examined, and found to contain, respectively, 5·8 and 9·8 per cent. of water, estimated by drying at 212°. The amount of alkaloid obtained from each of the above (dried at 212°) was 79·7, 76·7, and 74·3, the quantities thus varying inversely as the amount of water.

It was noticed that the samples containing the most moisture dissolved more readily in water, and their solutions were less colored than those which were originally drier.

Three samples of acetate were then examined in a similar way, and found to contain respectively 5, 10, and 12·6 per cent. of moisture. It was found that the sample containing least water fused and became dark-colored, with loss of structure on application of a water bath heat, while that containing the most water retained its pulverulent form unaltered at that temperature.

The morphia precipitated from these samples was found to be remarkably pure, being perfectly soluble in caustic potash, scarcely acted on by ether, and almost entirely free from codeia, as were also the mother liquors from which they were separated.

The author also quoted experiments by Mr. How, to show that, however feasible the conversion of morphia into codeia might appear on a comparison of their formulæ, it could not be carried out; a substance isomeric with codeia had been obtained, but it was by no means identical.—*Chemical News.*

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* Read at the meeting of the British Pharmaceutical Association.

NOTES ON THE CASES OF POISONING BY CALABAR BEANS IN LIVERPOOL, 10TH AND 11TH AUGUST, 1864.

By J. Baker Edwards, PH.D., F.C.S.,
Lecturer on Chemistry and Medical Jurisprudence at the Royal Infirmary School of Medicine, Liverpool.

1. About seventy children were poisoned by eating the beans, of whom about fifty were treated at the Southern Hospital in this town. The quantity taken by each child was from half a bean to six beans. The nuts were cracked, and the kernal eaten without the spermoderm.

2. The children were mostly under ten years of age, and the poison generally produced nausea and vomiting in half an hour. The secondary symptoms, trembling, dizziness, and loss of power in the limbs, came on within an hour of administration. Within three-quarters of an hour to one hour after eating, the children were brought to the hospital and at once treated with emetics. In the one case which proved fatal, the emetics (sulphate of zinc and mustard water) failed to act, and the child died by syncope within a quarter of an hour of his admission. He was said to have eaten four beans.

3. The organs were found healthy, except some tuberculous disease in the lungs. The blood was very fluid. The heart contained fluid blood and clot in all the four cavities, indicating death by paralysis of the muscles of the heart. Although there was no reddening of the coats of the intestines, there had been purging, which had removed all fæcal matter, leaving only in the intestines a whitish semi-fluid emulsion of the seed. The bladder was perfectly empty and contracted. There was really nothing in the *post-mortem* appearances to indicate the cause of death, except the peculiar contents of the intestines, and had these been removed by purging, there would have been nothing to distinguish between death by this poison and death by cholera. From my chemical analysis I should also infer that although in this instance circumstances favored the detection of the poison in the intestines after death, yet in a minimum fatal dose, or a prolonged purging before death, nothing would be found in the body to identify the poison or to account for death.

I am indebted to Dr. Frazer, of Edinburgh, who has investigated the subject with great ability, for a valuable communication during my analysis, and the tests Nos. 3, 4, and 5 in my analysis were suggested by him.

Conclusions.

1. The bean is edible in poisonous quantities, and although slightly rough in its flavor, does not appear to excite disgust or alarm when eaten alone, and would be undiscovered when mixed with food.

2. The symptoms are not always immediate, nor is vomiting induced, except when the dose is excessive; nor would the secondary symptoms, viz., dizziness, faintness, and loss of power in the limbs, excite sufficient alarm to call for medical assistance until life was really in immediate danger.

3. The symptoms would scarcely be distinguished from sudden indigestion or English cholera in time to save the life of the patient.

4. In criminal cases, nothing might be detected by autopsy or by chemical analysis to reveal the cause of death.

5. So insidious a poison should not only be stored, but also handled with great caution; its alcoholic solutions or extractive, when introduced into the circulation, acting as a slow but certain poison, leaving no trace in the body which can be identified by chemical tests in our present knowledge of the poison.—*Lond. Pharm. Journal, Sept.* 1, 1864.

MANUFACTURE OF VEGETABLE OILS.

Whether considered as a medium for the application of color in works of art, or of utility as the principal source of illuminating power where gas is unattainable, or as the lubricator without which all machinery, from the simple clock of the cottager to the most complicated and powerful engine, would be all but useless, the value of oil is incalculable; and a few words on its manufacture and the process of refining it cannot be uninteresting. To furnish these we were favored with a visit to the extensive works of Messrs. Pinchin and Johnson, who have two sets of premises: one, for the manufacture of oil, called Albert Works, on the Middlesex bank of the Thames, near Hammersmith; the other, for refining purposes, in Cable Street, St. George's-in-the-East. The oils they manufacture are rape and linseed only, but their refining operations extend to the animal as well as the vegetable oils. The Albert Works have a river frontage of about 200 feet, and recede from the bank about the same distance, thus covering an area of more than three-quarters of an acre. The building consists of four stories; the manufacture is carried on in the lowest, the others being used as storage for the grain, which is hoisted from the barges by means of cranes worked by steam-power. The first object which arrests the visitor's attention is the engine, which is a small but beautiful piece of machinery of forty-five horse power. With the exception of the workmen's meal-times and Sundays, it is always at work night and day. From the engine-room the visitor is conducted to the manufactory, where, as soon as he can recover from the irritation in the eyes produced by the volatile oil escaping from the heated and bruised seed, the whole process presents itself before him.

The grain is received from the upper floor into a *hopper*, in which is a screen, the agitating of which removes all foreign substances, and suffers the seed alone to pass through its meshes. This falls between two faced, hollow, iron cylindrical rollers, which are heated by steam, and which, as they revolve, crush, or, as it is termed, *open the grain*. Thus opened, it is thrown on to a *steel plate calf*, fixed on a bed of solid masonry, which is constantly traversed by a pair of edge-runners, weighing from eight to nine tons, and travelling at the rate of sixteen revolutions per minute. They revolve in a strong framework attached to a vertical axis, which also, by means of a large cog-wheel at the top, which engages a wheel upon the main shaft, revolves slowly. A double motion is thus given to the grinders or edge-runners, one on their own axis and one on the iron plate, which we may consider the nether mill-stone. A raised border or rim prevents the seed from escaping from the plate, and the paste is brought regularly under the stones by means of rakes or sweeps attached to the vertical framework, and revolving with the runners on the surface of the plate. When the grain has been sufficiently ground, the paste is brought to an open portion of the rim, and falls over into perforated troughs placed to receive it. Through the perforations a considerable quantity of oil oozes, and this, being considered purer than that which is obtained by expression, is conveyed to a cistern set apart for the purpose. The paste is next put into a jacketed kettle,—that is, one surrounded by a hollow chamber, into which steam is injected for the purpose of heating it. Within this kettle is an agitator or stirrer, so that all the paste is in turn brought to the heated surface and raised to an even temperature. Having remained in the kettle six minutes, it is collected in woollen bags, about eighteen inches long and six inches wide; each bag is placed between four layers of press hairs (a kind of horse-hair mat), and eight of them being thus prepared, they are ranged in two perpendicular rows between four grooved shelves of a hydraulic press. The pumps, worked by the steam-engine, are set in motion, and a pressure of 400 tons is speedily realized. The oil, being expressed, runs into an underground tank; the bags are then withdrawn, and on being removed, the residue presents itself in the form of what is known as linseed cake. These cakes are placed in a rack to cool, when they become so hard as not to be easily broken; they are then orderly stacked, and from time to time sent away in wagons or barges to supply the cattle-food market, for which purpose the cake is in great request.

A quarter of linseed, which only undergoes one pressure, yields an average of 120 lbs. of oil and 35 cakes of nutritious food, each weighing 8 lbs., or an aggregate of two hundred-weight and a half. Rape seed, which is twice ground and pressed, yields per quarter from 88 lbs. to 90 lbs. of oil at the first, and from 60 lbs. to 70 lbs. at the second pressure. Of these two kinds of oil-producing seeds upwards of 600,000 quarters are annually imported, and this mill alone works up 35,000 quarters per annum. Calcutta, Bombay, and Kurrachee are the great emporia for the seeds; and it is a remarkable fact that, whereas the last-named place, when it fell into the hands of the British in 1839, consisted of only about fifty wretched huts, inhabited by fishermen, it is now a thriving port, and one of the principal outlets for the oil-producing seeds of India.

After the oil has remained a few days in the receiving cistern, the parenchymatous matter subsides; it is then pumped into vats for a second settling, after which it is barrelled and conveyed to the refinery. This is situated about a quarter of a mile down the Blackwall line, of which property it occupies nine arches in its rear. The premises are very large, and are used not only for refining vegetable but also animal oils. The casks of unrefined oil are hoisted to the upper floor by means of a crane worked by steam. Along this floor a large vat, capable of holding ten tons, is extended. It is lined with copper, is fitted with a horizontal agitator or fan, and is called the reception vat. Into this receptacle five tons of rape oil are decanted, an equal quantity of water is added, and the whole treated by chemical process. The agitator is set in motion, and after four or five hours the oil becomes thoroughly washed, its impurities having been removed. The agitation is then stopped, and the water and bleaching ingredients are allowed to subside. The oil is next drawn off into the boiling vat on the next story. This vat also is lined with copper, fitted with fans or agitators, and a coiled perforated tube; steam is admitted into the tube until a uniform temperature of 212 degrees is obtained. It is kept in this condition and continually agitated for about four hours, when all impurities having been thrown off, it is allowed to cool, assisted by the fans, which bring every portion in turn into contact with the air. At the end of eight or ten hours it is sufficiently cool to be drawn off into the filters, which are on the lower story. Each filter contains five tons. Having passed through the filter, the oil, fully refined, is pumped into appropriate tanks to be ready for barrelling, and receives the name of colza oil, on account of its illuminating properties; the true colza being an oil expressed from the *Brassica oleracea*, a variety of the cabbage plant, from whose seeds an oil much used on the Continent is expressed.

Some idea may be formed of the vast quantity of purified rape-oil consumed for lubricating and illuminating purposes, when this refinery alone sends out upwards of two thousand tons per annum. A single railway company consumes three hundred tons a year, and the Great Eastern requires a thousand gallons for a single voyage to New York. Whale, seal, and sperm oils are refined by a more simple process. They are simply filtered through flannel bags; the residue of the common kinds is called foots, and is one of the ingredients used in the manufacture of soap. The deposit produced in the filtration of sperm oil is called spermaceti, and is very valuable, commanding a ready sale at £90 per ton. These oils are used for the purpose of illumination, only with the exception of sperm, which is employed in the cotton districts for the lubrication of spindles. Large quantities of olive oil are imported from Spain for lubricating machinery, and immense quantities of American lard are imported, pressed, and filtered for obtaining the oil known as lard oil, which is considered a good lubricator, and certainly has the quality of cheapness to recommend it.—*Lond. Pharm. Journ.*, *Sept.* 1, 1864, from *Mechanics' Magazine.*

ACCIDENTAL POISONING.

LIVERPOOL SUMMER ASSIZES.—CROWN COURT.—(BEFORE LORD CHIEF JUSTICE COCKBURN.)

Richard Poole surrendered upon an indictment, charging him with having, at Liverpool, feloniously killed and slain one John Lingard, on the 11th of April last. Mr. Aspinall, Q. C., and Mr. Samuell appeared for the prosecution; the Hon. Mr. Liddell, Q. C., and Mr. Potter for the defence. Prisoner pleaded not guilty.

It will doubtless be in the remembrance of our readers that the prisoner, a young man about twenty-five years of age, was a dispensing assistant in the establishment of Messrs. Clay and Abraham, chemists, Bold Street, and that the deceased was a plumber and glazier, residing in Mount Pleasant. On the 11th of April last, Dr. Nottingham prescribed a lotion and a powder for the deceased, who was suffering from an affliction in one of his eyes; the latter was to be composed of five grains of James's powder and six grains of Dover's powder. The prescription was taken, in accordance with the directions of Dr. Nottingham, to Messrs. Clay and Abraham's shop, in Bold Street, by Miss Witter, who was at the time staying at Mr. Lingard's house. The prescription was first handed to Mr. Whitton, who looked at it and then passed it on to one of the assistants, whose duty it was to copy it. That having been done, the prescription was given to the prisoner, who made it up. In doing so he had to use two bottles, and it appeared that the one containing James's powder was placed upon the same shelf and almost side by side with another bottle of the same size, form, and appearance, which contained strychnine. Between these two there was only one other bottle, of the same description, the strychnine bottle being the second, and the James's powder the fourth, from the end of the row. Before the powder was handed to Miss Witter it was passed on to Mr. Whitten, who, after looking at it and smelling it, gave it to the young lady. The powder was given to the deceased the same night, at bedtime, and almost immediately afterwards he complained of feeling ill. His symptoms rapidly developed into such as accompany strychnine poisoning, and in the course of an hour he died.

Mr. Aspinall told the jury that the real question they would have to consider would be, not so much what was the cause of death, as whether or not the circumstances under which the prisoner made up the prescription had been such as would bring home to him the charge of manslaughter. In order to make out the charge in a case of this description, it would be necessary to show that the prisoner had been guilty of gross and culpable negligence. The row of bottles, to which allusion had already been made, had been placed in a box in precisely the same order as that in which they had stood upon the shelf, and were in court; and the jury would see that the strychnine bottle had, in addition to the label "strychnia" on it, a second label, bearing the word "poison." He submitted that if the other facts of the case were proved, the jury would be of opinion that the negligence was made out, even though the two bottles might at the time have been reversed as to position on the shelf.

Dr. James S. Smyth, of Rodney Street, deposed that he saw deceased before death. He was sent for at half-past ten; reached deceased's house at twenty-five minutes to eleven; death took place a quarter before eleven. The deceased, when first seen by witness, seemed in comparative repose. He inquired from Dr. Harris, who was in the room on his arrival, if he had seen the previous convulsion, and what was the nature of the attack. Dr. Harris said that it seemed to be epileptic. Mr. Merrick, partner to the deceased, was present, and remarked that Lingard told him that there must have been strychnine in the powder that he had taken. Witness asked Lingard what he knew of strychnine; he said that he had once taken it as a medicine, and recollected the taste. Witness asked for the prescription of the powder, and retired with Dr. Harris to consult as to what was to be done. They had not been more than two minutes in the adjoining room before they were recalled. Lingard was then in strong convulsions, and in these he died. Cross-examined: Are you aware that Lingard suffered from gall-stones? Witness: No. Would not they, if present, produce great pain? Witness: Yes; but not cramp in the legs, which, as far as I understood from those in attendance, was the only pain complained of.

Amongst the witnesses examined in support of the prosecution was Dr. Nottingham, who gave evidence as to the appearance of the deceased's body after death. He made a *post-mortem* examination of the body eighteen hours after death, when the blood was fluid; the scalp, the membranes of the brain, and the membranes covering the spinal cord, were charged with blood; there was a considerable quantity of a reddish watery fluid in the cavity of the skull; the lungs were heavily gorged with dark fluid blood; the heart was empty. The stomach and contents were placed in a jar and sealed, and other portions of the body were placed in three other jars, and these were handed over to Dr. Edwards. Taking into consideration the symptoms attending the death of the deceased, and the appearances visible at the time of the *post-mortem* examination, he considered the cause of death to be poisoning by strychnine.

Dr. John Baker Edwards, analytical chemist and lecturer on chemistry and medical jurisprudence at the Liverpool Royal Infirmary School of Medicine, stated that he had examined the stomach portion of the duodenum, spleen, and heart, the liver, blood, and kidneys, handed to him by the last witness. After detailing the analytical treatment to which he had subjected the contents of the jars severally, he said the results of repeated and various tests applied to them corresponded in appearance with those which would be produced by strychnine. He had poisoned two frogs and two mice, with all the physiological effects of poisoning by strychnine, by administering to them small doses of the substance extracted from the contents of the jars which had before given the test results stated. From these experiments, he was satisfied that the stomach of the deceased contained a fatal quantity of strychnine. He also detected strychnia in the liver, in the kidneys, and in the structure of the tongue. He found traces of meconic acid in the stomach, but no antimony.

The Lord Chief Justice, addressing the witness,—Dr. Edwards, you have given your evidence with great distinctness and lucidity.

Joseph Whitton, an assistant in Messrs. Clay and Abraham's shop, said that on the 11th instant the prisoner was engaged as the regular dispenser, but had occasional assistance. It was his duty to make up the medicine. When Miss Witter brought Dr. Nottingham's prescription to him, he entered it in an order-book, and then passed it on to the prisoner. The powder contained James's powder and Dover's powder. He did not see the bottles from which the prisoner made it up. One bottle separated the bottle containing the James's powder from that containing the strychnine. The Dover's powder was kept on the dispensing counter on a shelf facing the dispenser's counter. There were five rows of bottles in an upright position, forming part of the dispensing counter, and in front of the dispenser. These bottles were in constant use, and they had no other bottles containing strychnine in the whole shop. The bottles were alphabetically arranged. The bottle between the strychnine bottle and the James's powder bottle contained Savine powder. When the lotion and the powder had been made up, it was placed by the dispenser on a till. Witness then took out the cork, examined the lotion, and found it correct. He next took the powder out of the wrapper, smelled at it, and being satisfied with it, he gave them both to Miss Witter. He could detect the Dover's powder by the smell; he did not look at the powder; the James's powder had no smell; neither had strychnine any smell.

Cross-examined by Mr. Liddell.—The bottles on this shelf had been rearranged since the 11th of April. That had been done in consequence of the presentment made by the coroner's jury. He was Messrs. Clay and Abraham's senior assistant.

It was Mr. Knowles's duty to arrange the bottles in that part of the shop, and also to put the drugs into the bottles. James's powder was very frequently used. James's powder and strychnine were so alike in color that had he opened the powder he would not have known the difference, but he could have detected it by the taste.

His Lordship.—But I suppose you are not in the habit of tasting the strychnine? (Laughter.)

Witness.—No, my Lord. (Renewed laughter.)

Cross-examination continued.—Prisoner had been two years in the employment of Messrs. Clay and Abraham. For some years previously he had been with a chemist at Southport. Witness had always found him very careful and attentive to his duties.

Richard Knowles, late assistant at Messrs. Clay and Abraham's shop, said the strychnine was kept at that establishment in a pulverized state. He had not examined the shelves on the 11th of April; but he did so the day previously, when he found they were in their right places. He was of opinion they were arranged in their proper order on the 11th of April.

Mr. Whitton was here recalled, and, in answer to Mr. Liddell, said that when he asked the prisoner what bottles he had made up the powder from, he pointed to the James's powder bottle and the Dover's powder bottle.

This was the case for the prosecution.

The Hon. Mr. Liddell, Q. C., then proceeded to address the jury on the prisoner's behalf. He said he was not going to deny that the deceased died from strychnine, for that would be utterly useless in the face of the evidence adduced. But there were two points to which he intended to address himself: one was, whether the strychnine was contained in the powder which the prisoner dispensed; and the second was, whether that powder, if so dispensed, was issued by him, and whether that issue was the result of gross and culpable negligence on his part. As to the point whether that powder was the powder which the prisoner dispensed, it was not for him to disprove, but for the prosecution to prove. Therefore, he had not any remarks to make upon that. There was one very curious thing in the case, that though the attention of the medical men were called to the deceased in a quarter of an hour after the powder was taken, no search ever appeared to have been made for that paper in which the powder was contained, and not one tittle of evidence had been given to show what had become of it. The only scientific evidence that the prosecutors could bring before the jury to show them that strychnine was taken from the powder dispensed by the prisoner was, that they found traces of an acid called meconic acid. He did not say it was impossible to discover even a minute portion of such an acid as that, but he did say this, and he thought the jury would agree with him, that supposing this was a question of poisoning by opium, and that the evidence had been that a small discoloration took place, caused by so small a quantity that figures would not represent it, they would have to pause well before they arrived at their verdict. It was remarkable that the deceased had taken strychnine before that date, and it had not been shown them when he discontinued taking it. He would now pass on to deal with what he considered was the real and substantial evidence on behalf of his client. His learned friend, in his opening remarks, said that in order to bring the evidence home against the prisoner, they must make out a case against him of gross and culpable negligence. He (Mr. Liddell) would not attempt to define what negligence was, because he believed it to be impossible to define it. He had looked through a great number of cases upon the point, and had read many books upon the point, and he defied anybody to give an accurate definition of what negligence was in that case. But this much he would say, that the question of negligence was the question for the jury, and the jury only ; and he should submit to them and to his Lordship that to make out negligence sufficient to justify the jury in finding the prisoner guilty of the felony of manslaughter, to say the least of it, it must be something more than mischance. Therefore, as he put it to the jury, the point that they would have to try, assuming, without admitting, that strychnine was given by the prisoner for James's powder, the question for them would be, did the evidence show that his conduct was the result of gross and culpable negligence, or was it not rather proved that the accident was the result of mischance ? Before examining the evidence adduced, he wished to make a passing remark, viz. that experience would teach them that, in all cases of that kind, when preliminary inquiries took place, when the matter was fresh in the mind of the public, and when the public mind was a good deal excited by sympathy for the poor deceased, there was a natural tendency to fix the blame upon somebody. And generally it very often happened that with that natural tendency upon their minds to satisfy doubts, it was said "Oh! it was so-and-so's fault," and that that somebody was a subordinate, and that he had to bear a great portion of the blame that attached to his superior. It was so in the case of the Egham accident, and he (the learned counsel) could not help expressing his surprise at reading the remarks made by the learned judge upon that case in his address to the grand jury. He said that in his opinion it was not right to throw the blame, when accidents of that kind took place, on persons in an inferior position; and that inferior persons employed upon the railway ought not to be made responsible for anything that occurred in consequence of a want of proper management or proper arrangements. Now he could not help drawing the attention of the jury to those remarks, which were made by a very learned judge. In that case, when the evidence was sifted, it turned out that proper arrangements were not made, and the prisoners arraigned were acquitted. If the jury, in considering the evidence in this case, should find that proper precautions were not taken to separate the poisons from the ordinary drugs; if they found that even in the state in which they were proper precautions were not taken to mark the poisons, not only by putting a label upon them, but also to make them distinguishable to the touch; if they found the prisoner was a well-conducted, careful person, bearing a high character for his position in life, who had always conducted his business in a careful and proper manner, and who had conducted his business upon that day in the ordinary manner, and had taken the ordinary precautions—there was no suggestion that he was drunk, that he was careless; there was nothing offered to show that by any act of his he was incapacitated to do his duty—and then if they found that in the hurry of his business, and possibly, in the gloom of the dark part of the shop, at half-past five o'clock in the evening, by a mere slip of the hand he took down the wrong bottle, and that, having done so, there was nothing to attract his attention to it, he made up the perscription in the usual way, taking the usual precautions before sending it out ;—he hoped, if he was able to make that out, the jury would exercise their discretion, and say it was rather a mischance accident than one due to gross and culpable negligence. After carefully going through the evidence, the learned counsel said that, supposing the strychnine had been kept at Messrs. Clay and Abraham's establishment in a crystallized state, and had been kept in corrugated bottles, the accident never would have arisen. There was the clearest admission on the part of the prisoner's superiors that they had not exercised proper precaution, in the fact that since the coroner's jury had made a presentment that the drugs should be separated from the poisons, they had been placed in a separate cupboard. Therefore the whole of these precautions being omitted, the prisoner was not answerable for that. He (Mr. Liddell) did not ask the jury for their sympathy,—he scorned to ask for it ; but he asked them as honest men and Englishmen, when they found that all the precautions he had alluded to had been omitted,—if they thought the accident arose in consequence of it,—he entreated them not to visit it upon the head of the young man who was then at the bar. The learned counsel called witnesses as to the prisoner's character.

Dr. Nicholl said he had always found him an unusually careful dispenser, in comparison with many others he knew.

Mr. Abraham said the prisoner had been two years in his employment, and during that time he had been one of the most careful, able, and attentive young men he had ever had in his shop.

His Lordship, in summing up, said that if the jury were of opinion that the death of the deceased was caused by an accident that might have happened to any careful and attentive man, it would be their duty to acquit the prisoner. According to the analysis of the very scientific gentleman (Dr. Edwards) who has been called before you, and who gave his evidence with a clearness and scientific precision which appeared to me extremely deserving of praise—if James's powder had been present it would have been inevitable that antimony would have been discovered, and there was none. Dover's powder was to a certain extent traceable, because there was that which indicated the presence of opium. Therefore it is suggested that strychnine was substituted by mistake for James's powder, the strychnine bottle being in most dangerous proximity to the James's powder. It was to be regretted that the arrangement since made by the firm of Clay and Abraham with respect to their drugs and poisons had not been made before the death of the deceased, as in that case the accident would never have occurred.

The jury after consulting together about five minutes, returned a verdict of "Not guilty," and the prisoner was immediately discharged.

CASE OF POISONING BY STRYCHNINE.—ACTION AGAINST THE CHEMISTS FOR DAMAGES.

Liverpool Assizes.—Nisi Prius Court, August 17.—(Before Mr. Baron Pigott.)

Lingard, Administratrix, *v.* Clay and Abraham.

This was a special jury cause, brought under Lord Campbell's Act, for the recovery of damages. The circumstances which were the cause of action have excited considerable attention, and gave rise to a trial for manslaughter during the present assizes. Mr. Attorney-General James, Q. C., Mr. Aspinall, Q. C., and Mr. Samuell, were retained for the plaintiff; Mr. Temple, Q. C., and Mr. Quain, were counsels for the defence.

When the case was called on,

Mr. Attorney-General James, addressing his Lordship, said—We are going to take a verdict, my Lord, for £1500.

His Lordship.—A verdict by consent, is it?

The Attorney-General.—If your Lordship will wait for one moment, it is necessary to say a few words. The action is brought under Lord Campbell's Act, and as there must be an apportionment, no doubt the jury will take what we suggest. The verdict will be for £1500; £500 to the widow, and £500 each to the two younger children. The eldest child comes in for some property by the death of the father.

His Lordship.—You must give the eldest child something.

The Attorney-General.—Yes, my Lord, we will give him, say, £1; though I don't know that it is necessary.

His Lordship.—Well, I thought that he had sustained some injury.

The Attorney-General.—Well, say a shilling to the other; then the verdict will be for £1500. 1*s.*

Mr. Temple.—Now, my Lord, this was an action brought by the administratrix of a person who met with his death in consequence of a person in the employ of the defendants, who are eminent chemists in this town, having unfortunately mixed strychnine, instead of James's Powder, with the medicine that had to be administered. Now, I was prepared with a large body of evidence, comprising nearly all the most eminent physicians and surgeons in this town, and also a great number of chemists from different parts of the country—amongst the rest, from the chemists of Her Majesty, who have dispensed the medicine of the Royal Family for the last thirty years—for the purpose of making out that, although this sad mischance had taken place, the defendants had always conducted their business with great care, and had so arranged the various medicine bottles, including poisons, as in their best judgment would be most likely to guard against accident. I have this vast body of evidence to express approval of the mode adopted by the defendants, and also to show that it was very commonly adopted and most approved of by the profession. I think it but justice, with the consent of the Attorney-General, to make that statement; but, as your Lordship knows, it would have amounted to no defence. We still should have been liable at law. And I may say that Messrs. Clay and Abraham have said to me that, even supposing they could have hoped for a verdict on any strictly legal ground, they should feel it their bounden duty, under the circumstances, to pay to the widow such a sum as might be considered reasonable and proper. For these reasons the defendants have consented, as has been stated, to a verdict for £1500.

His Lordship said—Gentlemen of the jury, I think we may all say we approve of the course the defendants have taken. For my own part, I must say, we all know accidents will happen, as the common saying is, in the best-regulated establishments; but I would make this one further observation, that in these matters of dealing with poisons I think it would be an excellent practice for everybody to keep them under lock and key, and separate from any other and harmless drugs. I do not by any means say the defendants have not done so. I am glad there would have been all this testimony to the good management of the establishment; and their having consented to a verdict is, I think, an act of good feeling on their part. The damages will be £1500, £500 of which will go to the widow. Under the Act of Parliament, you are to say how the damages shall be divided between the widow and children, if it is the case of a parent. In this case it is the parent, and £500 will go to the widow and £500 each to the younger children. The eldest child comes into some money by the death of the parent, and one shilling is sufficient, in view of the parties who are watching the case in his interest. You will find a verdict to this effect.

The jury found accordingly.—*London Pharm. Journ., September* 1, 1864.

ON DIGITALINE,

By M. Lefort.

The following account of the two foreign digitalines met with in commerce will be of interest to English readers, since this country is, we believe, entirely supplied with the article from Continental sources:—

1. *German or Soluble Digitaline.*—This is said by the author to be made by Merck, of Darmstadt. It is of a yellowish white color, neutral to test paper, completely and readily soluble in water and alcohol. It is, on the contrary, but slightly soluble in ether, sulphide of carbon, and benzole. Tannin completely precipitates it from an aqueous solution. In one particular it will be seen, that of solubility in water, this article differs essentially from that described in the British Pharmacopœia.

When the powder is dropped into hydrochloric acid it immediately dissolves, forming a yellow solution, which gradually turns brown and finally becomes green. The green color, however, is less bright than that given by the insoluble digitaline to be presently described, and the solution also remains transparent longer.

As the green color is developed the solution becomes turbid, and emits an odor resembling that of powdered digitalis or the tincture, and deposits a brown substance, which seems to be a compound of digitaline or of one of the principles accompanying with hydrochloric acid.

When exposed to the vapor of hydrochloric acid this soluble digitaline turns rapidly brown, but exhibits no green color.

Examined by a microscope with a high power the powder is seen to consist of small semi-transparent fragments, sometimes presenting sharp edges, but of no definite crystalline form. An alcoholic solution evaporates spontaneously to a clear varnish, and no traces of crystallisation can be observed.

2. *French, or Insoluble. Digitaline.*—The color of French digitaline varies from a yellowish white to a bright yellow. It is but very slightly soluble in cold water, a litre only dissolving about 0·50 gramme; it is very soluble in alcohol. Sulphuric ether, sulphide of carbon, and benzole dissolve a small quantity; tannin precipitates it from a saturated aqueous solution.

The powder dropped into hydrochloric acid gives a yellow solution which, in a few minutes, passes from a bright to a deep green, according to the quantity of digitaline employed; but as the green tint is produced, a deep green-colored substance is deposited, and a smell of digitalis is evolved.

When exposed to the vapor of hydrochloric acid it is first colored yellow, then brown, and afterwards green, the characteristic smell of digitalis becomes very apparent. The green powder (like the fresh powder of fox-glove leaves) becomes partially decolorised by exposure to sunlight, but the color can be restored by another exposure to the vapors of the acid.

This last reaction suffices to distinguish between soluble and insoluble digitaline, and the author considers it sufficient to prove the presence of the latter.

An alcoholic solution of French digitaline (Menier's,) left to evaporate spontaneously, and then examined by the microscope, showed a multitude of small spots, sometimes round and sometimes oval, which gave to the residue the cellular aspect of organised structure. This appearance the author considered to support the opinion of Homolle, who supposed that insoluble digitaline was never a single and constant product; and he, in fact, determined that French digitaline contained some volatile matter which communicated its characteristic odor.

The whole of M. Lefort's experiments showed that French and German digitaline differ considerably in their chemical and physical properties, and he is disposed to infer that as great differences may be found in their therapeutical properties.

With regard to the separation of digitaline by means of dialysis, the author found that a simple solution of the substance quickly dialysed, and the digitaline could easily be found in the diffusate. But when a mixture with animal and vegetable substances was placed on the dialyser, the deposite obtained on evaporating the diffusate gave but indistinctly the characteristic reactions of digitaline. Among these characters the most conclusive appear to be the bitterness of taste, the green coloration of liquid hydrochloric acid, and the development of the peculiar odor of digitalis on exposure to the vapor of hydrochloric acid.

[It may interest some of our readers to know that the volume of Gmelin's "Chemistry" just issued contains an excellent account of digitaline, and the various processes for obtaining it.—Ed. C. N.]—*Chem. News, Aug.* 27, 1864.

ON THE RED VARIETY OF PITAYO BARK.

By J. E. Howard, F. L. S., etc.

Mr. Robert Cross, who was employed to collect seeds of the Cinchonæ on behalf of the Indian Government, in the district of Popayan, sent over recently the bark, together with the seeds, of that which he calls "The red variety of Pitayo, the best of all." He gave ten ounces of this bark to Dr. Jameson, of Quito, who says it is the true Pitayo bark of New Granada, and extracted 3·2 per cent. of quinine from it. Mr. Markham, in sending me the seeds, writes as follows:—"I enclose some specimens of bark and some seeds of *Cinchona Pitayensis*, collectd by Cross last August. They were collected from trees growing on lofty ridges near Popayan, where it sometimes freezes,—temperature 30° to 60° Fahrenheit."

The bark was at once recognized as the superior quality of

Pitayo bark, which bears a high value in this market, as well as in Paris, equal in fact to that of Calisaya. From a small portion of that given to me, gathered by Cross, I obtained the surprising amount of 8·6 per cent. of alkaloid soluble in ether, and the portion which formed crystalline salts indicated like results with those mentioned by Dr. Jameson.

There is, I believe, no doubt that this is the same sort of bark which was given by Mr. Delondre to Dr. de Vry, described by him as the root-bark of *C. lancifolia*, and from which Dr. de Vry obtained 8·66 per cent. of alkaloid. If I understand rightly, this identity isadmitted on all sides; but the questions remain,—First, is it the produce of *C. lancifolia* (Mutis)? Second, is it root-bark at all? As to the first question, it is certainly an error to identify the *C. Pitayensis* with the *C. lancifolia* (Mutis). I send a drawing of the *C. Pitayensis*, which was made by Mr. Fitch from specimens gathered by Mr. Jervise, and now found in the herbarium of Sir William J. Hooker, at Kew. They comprise the *roja*, or red, and *naranjada*, or orange, varieties,* and are accompanied by characteristic specimens of the bark of these two sorts. Between these no botanical difference that I am aware of can be traced, and both constitute a species markedly distinct from the *C. lancifolia* (Mutis),† which has been very well figured both by Weddell and Karsten; whilst the *C. Pitayensis* has never till now been represented, as far as my knowledge extends, although it is certainly one of the very best kinds of Cinchona, and far superior to the *C. lancifolia* (Mutis), which last has been for a long time almost entirely neglected by the collectors.

In the next place, is it root bark? I presume not, as Cross never intimates anything of the kind respecting the specimen bark which he sent home. The appearance of the bark, which is peculiar, might most readily correspond to that which would be produced by shrubs, growing high up the mountains, and in so low a temperature as is above described. This is exactly the climate and circumstances to favor the production of qui-

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*I have also from Paris the *morada* and *blanca* varieties exhibited in sections of branches, but not in flowers or fruit.

† I have specimens given by Mutis to Bonpland, and presented by the authorities of the Museum of the Jardin des Plantes; also an excellent specimen gathered by Dr. Karsten.

nine in the bark, as has been well shown by Dr. Carsten, and exemplified also in the Calisaya of St. Fé in particular. No doubt the Indian Cascarilleros may strip roots and all, and mix these with the bark, and, in the fragmentary condition in which it comes, it is impossible to distinguish the bark of the different parts of the plant; but the extraordinary produce I must persist in believing to be due to the circumstances above named, and not to that of its being root-bark, which, as regards the great bulk of the collection, I do not believe.

Whilst compelled to differ on this point, I most willingly bear my testimony to the great value of the table given in last month's Pharmaceutical by Dr. de Vry. The exactness and fidelity with which these able researches are reproduced, enable all persons to form their own conclusions, and to me the results seem to indicate a general inferiority in the root-bark as compared with the trunk of the Calisaya.—*Lond. Pharm. Journal, August*, 1864.

NOTES ON THE NEW ALMADEN QUICKSILVER MINES,

By B. Silliman, Jr.

The New Almaden quicksilver mines are situated on a range of hills subordinate to the main coast-range, the highest point of which at the place is 1200 to 1500 feet above the valley of San José. Southwest of the range which contains the quicksilver mines, the coast-range attains a considerable elevation, Mt. Bache, its highest point, being over 3800 feet in height.

New Almaden is approached by the railroad running from San Francisco to San José, a distance of 45 miles. In the course of it there is a rise of 100 feet, San José being of this elevation above the ocean. From San José to New Almaden the distance is 13 miles, with a gradual rise of 150 or perhaps 200 feet.

The rocks forming the subordinate range in which the quicksilver occurs, are chiefly magnesian schists, sometimes calcareous and rarely argillaceous. As a group they may be distinguished as steatitic, often passing into well characterized serpentine. Their geological age is not very definitely ascertained, but they are believed by the officers of the State Geological Survey to be not older than Cretaceous. But few fragments of fossils, and these very obscure, have yet been found in these metamorphic rocks. At a point just above the *dumps*, behind the reduction works at the hacienda (or village), there is an exposure, in which may be clearly seen in projecting lines the waving edges of contorted beds of steatite and serpentine, interspersed with ochery or ferruginous layers, more easily decomposed; and the partial removal of the latter has left the steatitic beds very prominent.

The mine is open at various points upon this subordinate range over a distance of four or five miles, in a northeast direction. The principal and the earliest workings of the mine were in a right line, but little more than a mile distant from the hacienda. The workings are approached, however, by a well-graded wagon-road, skirting the edges of the hills, which is $2\frac{3}{8}$ miles in length.

It appears, partly from tradition, and partly from the memory of persons now living, that the existence of cinnabar upon the hill was known for a long time prior to the discovery that it possessed any economic value. In fact, upon the very loftiest summit of this subordinate range, cinnabar came to the surface, and could be obtained by a slight excavation, or even by breaking the rocks lying upon the surface. In looking about for physical evidences such as would aid the eyes of an experienced observer in detecting here the probable presence of valuable metallic deposits, one observes on the summit of the hill, at various points along the line of its axis for two or three miles, and also beyond, toward the place called Bull Run, occasional loose boulders of drusy quartz, with more or less well characterized geodes and combs; accompanying which is an ochraceous or ferruginous deposit, such as frequently forms the outcrop of metallic veins. There is, however, no such thing as a well characterized vein, the quartz and its associated metals occurring rather in isolated masses or bunches segregated out of the general mass of the metamorphic rocks, and connected with each other, if at all, somewhat obscurely by thread veins of the same mineral.

The main entrance to the mine at present is by a level about 800 feet long, and large enough to accommodate a full-sized railroad and cars. This level enters the hill about 300 feet from its summit, and is driven into a large chamber, formed by the removal of a great mass of cinnabar, leaving ample space for the hoisting and ventilating apparatus employed in working the mine.

At this point a vertical shaft descends to an additional depth of nearly 300 feet, over which is placed a steam "whim" with friction gearing and wire rope, worked by a steam engine, and by means of which all the ore from the various workings of the mine is conveniently discharged from the cars, which convey it out of the level to the dressing floors.

The first thing which strikes the observer on entering the mine is the liberal scale of its exploration. Everything indicates a liberal and judicious use of capital in the development of a property which, upon any other principle of exploration, would probably have been unremunerative. We note also the absence of the usual galleries or levels, cut at regular distances of ten fathoms, common in the exploration, for example, of copper mines, and of other metallic deposits in which the ore is confined to well characterized veins.

In order to reach the lower workings of the mine, the observer may employ the bucket as a means of descent, or he may, in a more satisfactory manner, descend by a series of ladders and steps, not in the shaft, but placed in various large and irregular openings, dipping for the most part in the direction of the magnetic north, and at an angle of 30° to 35°. These cavities have been produced by the miner in extracting the metal, and are often of vast proportions; one of them measures 150 feet in length, 70 feet in breadth, and 40 feet in height—others are of smaller dimensions; and they communicate with each other, sometimes by narrow passages, and at others by arched galleries cut through the unproductive serpentine.

Some portions of the mine are heavily timbered to sustain the roof from crushing, while in other places arches or columns are left in the rock for the same purpose.

The principal minerals associated with the cinnabar are quartz and calcareous spar, which usually occur together in sheets or strings, and in a majority of cases penetrate or subdivide the masses of cinnabar. Sometimes narrow threads of these minerals, accompanied by a minute coloration of cinnabar, serve as the only guide to the miner in re-discovering the metal when it has been lost in a former working.

Veins or plates of white massive magnesian rock and sheets of yellow ochre also accompany the metal. Iron pyrites is rarely found, and no mispickel was detected in any portion of the mine; running mercury is also rarely, *almost never*, seen.

The cinnabar occurs chiefly in two forms, a massive and a subcrystalline. The first is fine granular, or pulverulent, soft, and easily reduced to the condition of vermillion; the other is hard, more distinctly crystalline, compact and difficult to break; but in neither of these forms does it show any tendency to develop well formed crystals. It is occasionally seen veining the substance of greenish white or brown compact steatite or serpentine.

The ores are extracted by contract, the miners receiving a price dependent upon the greater or less facility with which the ore can be broken. By far the larger portion of the work people in the mines are Mexicans, who are found to be more adventurous than Cornishmen, and willing oftentimes to undertake jobs which the latter have abandoned. The price paid for the harder ores in the poorer portions of the mine is from $3 to $5 per cargo of 300 lbs. This weight is obtained after the ore is brought to the surface and freed by hand-breaking from the superfluous or unproductive rock; by this arrangement, the company are secured from paying for anything but productice mineral. All the small stuff and dirt formed by the working of the "labors," are also sent to the surface to form the adobes used in charging the furnaces.

It has often happened in the history of this mine, during the past fifteen years, that the mine for a time has appeared to be completely exhausted of ore. Such a condition of things has, however, always proved to be but temporary, and may always be avoided by well directed and energetic exploration. Upon projecting, by a careful survey, irregular and apparently disconnected chambers of the mine in its former workings in a section, there is easily seen to be a general conformity in the line of direction and mode of occurrence of the productive ore-masses. These are found to dip in a direction toward the north, in a plain parallel, for the most part, to the pitch of the hill, but at a somewhat higher angle. An intelligent comprehension of this general mode of structure has always served hitherto in guiding the mining superintendent in the discovery of new deposits of ore.

Since the settlement of the famous law-suit, which has so long held this company in a condition of doubt, the new parties, into whose hands the property has now passed, have commenced a series of energetic and well directed explorations at various points upon the hill, with a view to the discovery of additional deposits of ore. At one of these new openings, distant at least 500 feet from the limit of the old workings, and not more than 200 feet from the summit of the hill, a deposit of the richest description of the softer kind of cinnabar has been discovered, which, so far as hitherto explored, has a linear extent of at least 70 or 80 feet, and in point of richness has never been surpassed by any similar discovery in the past history of the mine. A charge of 101,000 pounds, of which 70,000 were composed of this rich ore, 31,000 pounds of "granza," or ordinary ore, and 48,000 pounds of adobes, worth 4 per cent, making a total charge of 105,800 pounds, yielded on the day of our visit, 460 flasks of mercury at 76½ pounds to the flask. This yield is almost without parallel in the history of the mine. The only preparation which the ores undergo, preparatory to reduction, consists of hand-breaking, or "cobbing," for the removal of the unproductive rock.

The small ores and dirt hoisted from the mine are made into "adobes," or sun-dried bricks, sufficient clay for the purpose being associated with the ore. The object of these "adobes" is to build up the mouths of the furnaces to sustain the load of richer ores. No flux is employed, there being sufficient lime associated with the ores to aid the decomposition of the sulphurets.

The furnaces are built entirely of brick, in dimensions capable of holding from 60,000 to 110,000 pounds, according to the character of the ores employed. The chambers are fired from a lateral furnace, fed with wood, and separated from the ore by a wall pierced with numerous openings by the omission of bricks for that purpose.

Connected with the furnace is a series of lofty and capacious chambers, also of masonry, through which the whole product of combustion is compelled to pass alternately above and below, from chamber to chamber, until all the available mercury is condensed. The draft from these furnaces is carried by inclined stacks up to the top of a lofty hill several hundred feet distant; and here the sulphurous acid and other effete products of the furnace are discharged. Formerly, no precautions were taken to prevent the escape of mercury through the foundations of the furnace to the earth beneath: now, the furnaces stand upon double arches of brick-work, and plates of iron are built into the foundations, so as to cut off entirely all descending particles of the metal and turn them inward. To be convinced of the importance of this precaution, it is sufficient to watch the operation of the furnace for a few moments, when an intermittent stream may be seen to flow into a reservoir provided for it, and which by the former process was completely lost in the earth.

On taking up the foundations of some of the old furnaces, within the last two years, the metal was found to have penetrated, or rather permeated, completely through the foundation and clay of the substructure down to the bed-rock beneath, a depth of not less than 25 or 30 feet. Over 2000 flasks of mercury were thus recovered in a single year from the foundations of the two furnaces. This loss is entirely avoided by the improved construction which has been adopted.

The whole process of reduction is extremely simple, the time occupied from one charge to another being usually about seven days. The metal begins to run in from four to six hours after the fires are lighted, and in about sixty hours the process is completed. The metal is conducted through various condensing chambers by means of pipes of iron, to a "crane-neck," which discharges into capacious kettles. It undergoes no further preparatian for market, being quite clean from all dross.

Deducting 2½ years, during which the mines were in a state of inactivity, pending the decision of the law-suit, the average monthly product for 12½ years has been not far from 2,500 flasks, of 76½ pounds each, of mercury. The selling price in San Francisco is, at present, and has been for some time past, 75 c. per pound, while in London and New York it has ranged from 40 to 50 c. per pound.

San Francisco, May, 1864.

—*Amer. Jour. Sci. and Arts.* Sept., 1864.

DROPS.

By Charles W. Quin, F. C. S.

Mr. Frederic Guthrie, Professor of Chemistry and Physics at the Royal College, Mauritius, has lately brought before the Royal Society the results of some investigations recently made by him into the laws which govern the formation of drops, an account of which cannot fail to interest our readers.

On turning to the subject of drops, as treated of in "Parrish's Practical Pharmacy," or any other standard pharmaceutical work, we cannot help being struck with the great difference observable in the relative size and weight of the drops of different fluids. Thus, although we are always taught that a fluidrachm contains on an average sixty drops, each of which is equal to a minim or a grain, we find it stated in Parrish, on the authority of Durand, that a fluidrachm of distilled water, hydrocyanic acid, or weak ammonia, contains only forty-five drops, or in other words that a drop of either of these substances is one-third greater than it is generally supposed to be. In the case of other fluids the discrepancy is in the opposite direction—for instance, a drop of crystallizable acetic acid, diluted alcohol, tincture of opium, and several other liquids used daily by the pharmacist, is only half the supposed size. A patient, therefore, who is prescribed acetic acid in drops gets less than the supposed quantity, while the one who is ordered hydrocyanic acid by the same measure would get more than the proper amount.

According to the same authority, the bottle or measure from which the liquid is dropped has a great influence on the size of the drops. Thus, according to Parrish's experiments, seventy-three drops of acetic acid dropped from a pint tincture bottle made up a fluidrachm, while 102 drops were necessary when a minim measure was used. These differences seem to show the difficulty of obtaining a standard drop—a difficulty which is still more increased by the knowledge that even when the same vessel and liquid are used the differences are almost as great as those already cited. Thus, in experimenting on water with ounce vials, Parrish found that in seven trials the number of drops required to make up a fluidrachm varied between thirty-two and sixty-five. The necessity, therefore, for Professor Guthrie's investigations is at once apparent.

The Professor sets out by defining a drop as any mass of liquid matter whose form is visibly influenced towards the spherical by the attraction of its parts, and whose sensible motion or tendency is towards the earth. He then goes on to exclude from consideration drops which are formed under indefinite, or at any rate unmeasurable, circumstances, such as rain drops, including only those that are formed under fixed and determinable conditions. The drops which form the subject of experiment may, therefore, be defined as masses of liquid collected or held together by the attraction of their parts, and separated from each other by the attraction of gravitation. This definition includes upward-moving drops, which are formed when a heavy liquid, such as water, is carefully poured into a bottle containing a lighter one, like petroleum, the bottom of the vessel always holding a certain quantity, which gradually "drops up" to the surface.

The size of a drop generally depends on, and is influenced by at least four conditions:—1. The self-attraction of the drop-generating liquid. 2. Its adhesion to the matter on which the drop is formed. 3. The shape of this matter. 4. The physical relations existing between the matter on which the drop is formed, the liquid constituting the drop itself, and the medium through which it passes.

Denoting the three states of matter by the letters S (solid), L (liquid), and G (gaseous), and considering the symbols in the order in which they are written to denote respectively the matter from which the dropping takes place, the drop and the medium, we get a convenient notation. There are eight variations of these conditions, but only three of them are possible.

S L L, when from a solid a liquid drops through a liquid.

S L G, when from a solid a liquid drops through a gas.

L L L, when from a liquid a liquid drops through a liquid.

Of these three cases the first and last may be reversed,—as when from a solid a liquid *ascends* through a liquid; and when from a liquid a liquid *ascends* through a liquid. The middle case, of course, cannot be reversed as it would presuppose the existence of a liquid lighter than a gas.

The case S L G is the most common and important, and is the only one at present investigated by Professor Guthrie. In this case the variable conditions are the self-attraction and cohesion of the liquid, which is dependent on its chemical and physical constitution; the adhesion between the solid and the liquid, which is dependent on their relative chemical and physical constitution, and the shape of the solid. Temperature has also a considerable effect on the solid liquid and gas. There are also two other conditions,—the adhesion of the gas to the solid and to the liquid; but as atmospheric air at ordinary barometric pressure is always the gaseous medium through which the drop falls, these need not be noticed. The condition, however, which has the greatest effect on the size of the drop is the interval which takes place between the successive drops, and called by Professor Guthrie the *growth-time*. *Ceteris paribus*, therefore we may say that the growth-time being constant, the size of the drops produced will be the same for the same liquid.

In the first series of experiments Professor Guthrie used an ivory sphere having a diameter of 22·1 millimetres, and suspended from a retort stand by three fine wires. The sphere was dipped in hydrochloric acid so as to deaden its surface. The liquid under experiment was contained in a cylindrical vessel, and always kept at the same level by means of a pear-shaped reservoir, containing the same liquid, suspended over it with the mouth just touching the surface. The liquid was conveyed to the ivory ball, the upper half of which was covered with cotton wool, by a syphon which could be easily raised or lowered at pleasure, so as to regulate exactly the amount of liquid flowing on to the ball. The end of the syphon was slightly turned up, and touched a plug of cotton on the top of the sphere. The drops formed were received in a funnel placed in a beaker.

Cocoa-nut oil was the liquid used in the first series of experiments which had for their object the determination of how far the rapidity of dropping influenced the size of the drops, and to establish the fact of the uniformity between the size of drops falling at equal intervals of time. The temperature being at 28°·5 C, the flow of liquid was so regulated that a second elapsed between the fall of each drop. Eight batches of sixty drops each were then weighed accurately, and were found to have a mean weight of 3·9767 grammes, the variation between the extremes being insignificant. Thirty batches of sixty drops each were then prepared, the growth-time being varied six times in the course of the experiments, and ranging between 0·435 to 0·767 of a second. In this series of experiments some curious irregularities occur which have been confirmed by other experiments. The following table will show this :—

GROWTH-TIME.	MEAN DROP-WEIGHT.	GROWTH-TIME.	MEAN DROP-WEIGHT.
Seconds.	Grammes.	Seconds.	Grammes.
0·433	0·07540	0·633	0·07281
0·500	0·07275	0·700	0·07059
0·567	0·07456	0·767	0·06912

It will be seen that the weight of a drop formed in 0·500 of a second is less than those falling either in 0·567 of a second, or 0·633 of a second, although the law appears to be at first sight that the weight of a drop should diminish as its growth-time increases. In order to endeavor to establish some law with respect to these discrepancies, Professor Guthrie undertook a long series of experiments: the growth-time of the drops varying from the third of a second to twelve seconds, with the following result :—

From 0″·333 growth-time to 0″·433 there is diminution.
" 0″·433 " " 0″·450 " increase.
" 0″·450 " " 0″·467 " diminution.
" 0″·467 " " 0″·500 " increase.
" 0″·500 " " 12″·000 " continual dimin.

On the whole, the law seems to be that the slower the dropping, the smaller the drop. It was found too, that when the time between the drops was decreased to below 0·333, a continuous stream was the result. This first fact is most interesting to the pharmacist, as showing the influence of rate in dispensing drops. For a growth-time, 0·333, we get a drop weighing 0·09264 grammes, while for a growth-time of 1½ seconds, we get a drop of only two-thirds the weight. A pharmacist who dispenses 100 drops of a liquid at the rate of three drops a second, will give half as much again as another who measures the same liquid at the rate of a drop every second and a half.

One peculiar fact that appeared during these investigations, was that when the drops changed to a stream, from the supply of liquid being increased, the amount of oil having decreased in quantity, or in other words, a fine stream delivered less in a given time, than a series of large drops.

It also appears that there is no such thing as a normal drop, for at no degree of slowness in dropping do the drops assume a size unaffected by a slight change in the rate of their sequence. Professor Guthrie has also tried the effects of gradually decreasing the strength of saline solutions dropping at the rate of two seconds, and found that *decrease in solid constituent produced precisely the same effect upon the size of the drop as decrease in the growth-rate in the drops of a homogeneous liquid*, the same apparently abnormal maxima and minima presenting themselves.

In a theoretical point of view, these peculiar relations have the greatest importance, and will materially assist in determining the relation between a dissolved solid and its solvent. The secondary maxima and minima in the case of the chloride of calcium solution, may result from the formation of definite hydrates. Professor Guthrie does not give the exact amount of solid matter in the chloride of calcium solutions used, but only uses a nearly saturated solution, and dilutes it with twice 4, 8, 16, 32, &c., times its bulk of water. Had he given us equivalent solutions it would have been most interesting.

These experiments remind us in principle of those of Mr. Graham, in transpiration of fluids, or the passage of fluids through capillary tubes. Here similar apparent discrepancies occurred, but they were cleared up by the discovery that the definite hydrates always exerted a peculiar influence in retarding or accelerating the flow. In both cases friction of a fluid against a solid takes place, which friction is diminished or increased primarily, according to the amount of solid matter in the solution, and secondarily by that solid matter being in a state of mechanical or chemical union with its solvent. We should strongly recommend Professor Guthrie to experiment on solutions of the acids, and see the effect of their definite hydrates in altering the size of drops. According to Graham, nitric acid, with three equivalents of water, is found to have a lower rate of transpiration than when diluted more or less. With sulphuric acid, the maximum occurs with the monohydrate, with acetic acid, the byhydrate with hydrochloric acid, the dodecahydrate and so on. The determination of the relations, too, between the drop-size, and the boiling points, and composition of the alcohols, ethers, &c., would be most interesting. The influence of temperature also needs inquiring into, in fact, there is an enormous and evidently most fruitful field open to Professor Guthrie's talents and patience, of both of which the present paper has given us so high an opinion.—*Chemist and Druggist.*

ACTION OF LIGHT ON SANTONINE.—PHOTO-SANTONIC ACID.

By M. Sestini.

Santonine, it is well known, is colored yellow by exposure to solar light, and this takes place in a vacuum as well as in the air. It does not take place, however, when the actinic rays are cut off by means of a solution of nitrate of uranium.

Crystals of santonine reduced to powder and then exposed to light, not only change color, but evolve a resinous odor, and acquire a very bitter taste. Water added to this changed santonine acquires a yellow color, presents an acid reaction, and has a bitter taste. On distillation the same water yields an acid liquid, which reduces nitrate of silver and bichloride of mercury, and precipitates acetate of lead white. The author concluded that the volatile matter formed during the coloration of santonine by light was formic acid. On evaporation to dryness the distillate gives a deep red-colored resinous residue.

By treatment with water the colored santonine almost entirely lost its odor. On treatment with alcohol, it now in great part dissolved, giving a yellowish solution, which, on evaporation, left a reddish-yellow residue, the greater part of which was soluble in ether. The etherial solution left an uncrystallizable residue of an amber color, and with a very bitter taste.

In subsequent experiments made by exposing santonine to light under water from which all air had been carefully expelled, the author obtained exactly the same results, and hence concluded that by exposure to solar light, santonine is changed into formic acid, and an uncrystallizable substance much more soluble in alcohol and ether than santonine itself, and also a red resinous substance. To the yellow uncrystallizable substance he has given provisionally the name *photo-satonic acid.*

The acid, on analysis, gave results which agree very nearly with the formula $C_{22}H_{14}O_4$. Its chemical properties will be described in a future memoir.—*Lond. Chem. News*, from *Bul. de la Société de Paris*, July, 1864.

A NEW METHOD OF ESTIMATING SULPHURIC ETHER.

By MM. Regnauld and Adrian.

The purity of ether is commercially estimated by its density, but this is not a rigorous mode of determination, since it is disputed what instrument is to be used. There is also the incorrectness in the graduation of commercial instruments, and, moreover, the temperature is not taken into account.

Some degree of regularity is attained by using a gravimeter, but by itself this determination is insufficient, since the ether is mixed at the same time with water and alcohol in variable proportions.

The first step towards obtaining a correct estimate is to simplify the nature of this complex product.

Having ascertained that carbonate of potassa completely dehydrated ether, the authors found that the same salt brought alcohol mixed with the ether to 98° centesimal without going beyond.

These points established, they base their process on the estimation of the degree of purity of ether by determining its density before and after the action of dry carbonate of potash. They have arranged a table so as to dispense with calculation. The proportions of pure ether, alcohol and water contained in any ether can be determined by two gravimetric experiments.

Note.—The temperature for the two experiments should be kept rigorously at + 15 , and the shaking of the mixture with the dry carbonate of potash, which is effected in a stopped flask, should last from twenty-five to thirty minutes.—*Lon. Chemical News*, from *Bulletin de la Société Chimique*, vi. 461, 64.

ABSTRACTS OF PAPERS READ AT THE LATE MEETING OF THE BRITISH PHARMACEUTICAL CONFERENCE,

Held at Bath, England, Sept. 14, 1864.

ON THE EXTRACTION AND PRESERVATION OF AROMATA. BY C. R. C. TICHBORNE, F. C. S., CHEMIST TO THE APOTHECARIES' HALL OF IRELAND.

Observing the preservative powers of glycerin for vegetable substances, the author packed different kinds of scented flowers in jars, and covered them with glycerin. In this way he had kept some for two years. If flowers, &c., so preserved be pressed, it is found that the glycerin has absorbed all the volatile oil, and when diluted and distilled furnishes a water in all cases superior to that from flowers preserved by salt. If the odoriferous glycerin be diluted and agitated with oils or fat, ointments, &c., of excellent quality are produced. In all these cases the glycerin is recovered by mere evaporation of water from it. The delicate oils of orange, jasmine, heliotrope, etc., are best isolated by steeping the flowers in the glycerin, pressing, and again steeping more flowers, and so on; finally diluting with water and shaking with chloroform, which removes the oil. The low-boiling point of the chloroform admits of its being separated from the oil by a temperature which does not injure the oil.

ON THE PHARMACEUTICAL APPLICATION OF GLYCERIN. BY MR. F. BADENBENGER.

In this paper a short history was given, and a *résumé* of its applications in Pharmacy. The preparations known as "plasma," in which glycerin with starch is substituted for lard, as a basis of ointments, had been made the special subject of experiment by the author. He had found *tous-les-mois* starch superior to any other in making the simple plasma. Fifty grains of *tous-les-mois* were to be rubbed with one ounce of glycerin, and the mixture heated to 240° for a few minutes or till it became translucent. He thought that plasma might replace lard in ointments having a tendency to become rancid, but its relatively great expense would preclude its general adoption. The glyceroles, or solutions of different substances in glycerin, were then noticed. A good "tincture of myrrh and borax" could be made by dissolving one part of borax in two of glycerin, and adding tincture of myrrh. As substitutes for syrup, the glyceroles did not appear to possess any superiority. Its use as an excipient in pill-making was strongly advocated.

ON THE APPLICATION OF DIALYSIS IN DETERMINING THE NATURE OF THE CRYSTALLINE CONSTITUENTS OF PLANTS. BY J. ATTFIELD, PH. D., F. C. S.

The author had dialysed a few plant-juices, the first that came to hand, and from each had obtained some of the crystalline constituents. The tops of the common potato yielded a crop of nitrate of potash, some cubes of chloride of potassium, hexagonal crystal not analysed, sugar, and an ammonia salt. The deadly nightshade gave nitrate of potash, an unknown magnesia salt in square prisms, sugar, etc. Pea-pods yielded only sugar. The common garden lettuce contained nitrate of potash, tetrahedra of undetermined composition, sugar and ammonia. Cucumbers furnished sugar, ammonia and sulphate of lime. The cabbage also furnished sulphate of lime and ammonia. Stramonium contained so much nitrate of potash, that dried portions quite deflagrated on being ignited.

From these experiments the author thought the proposed application of dialysis promised to be of great service, directly and indirectly, in investigating vegetable physiology.

ON THE PURITY OF FOREIGN IODIDE OF POTASSIUM. BY F. C CLAYTON.

The high price and large consumption of this article has made it one which the manufacturer has special temptations to adulterate. Of late years very large quantities of foreign make have found their way into our markets, giving rise to keen competition, which, in the case of drugs, is often far from improving their quality. From these considerations we might still expect to find much that is impure, but the results detailed below lead us to a different conclusion. The impurities of iodide of potassium are bromide and chloride of potassium, and sulphate, iodate, and carbonate of potash. Moisture in excess is also to be considered an impurity, for, besides giving the sample a greater liability to deliquesce, it shows an article of imperfect manufacture. The first-mentioned adulterant, though it has at times been frequently used, has in none of the fifteen samples experimented upon been found, and the second only in quantities from 3·7 per cent. down to minute traces. Sulphate was never found in ponderable quantities, and iodate in only 3, all of which, however, were of foreign manufacture. (Several English samples were analysed for the sake of comparison.) In these three cases it never amounted to 1 per cent. Carbonate, though more generally present, never amounted to 1 per cent., generally much under this. From these results, it will be seen that the iodide of potassium now in the market is practically pure, the percentage in all the samples being over 95°

ON A TEST FOR METHYLIC ALCOHOL IN PRESENCE OF ETHYLIC ALCOHOL, WITH REMARKS ON METHYLATED SPIRIT. BY MR. JOHN TUCK.

After referring to the value of methylated spirit and the composition of wood naphtha, the author stated it to be his opinion, that wood naphtha, once mixed with spirit of wine, could not be again separated; and that, though the characteristic odor of methylated spirit could be removed, yet the process required such cumbersome apparatus, that its use would certainly be followed by official detection. Seeing, however, that the illegal process might possibly be employed, and the revenue be thus defrauded, and the inodorus methylated spirit be used in Pharmacy and in concocting liqueurs, he had searched for a test, whereby even the deodorized naphtha could be detected, when mixed with spirit of wine. Such a test he had found in an alkaline solution of the double iodide of potassium and mercury. On boiling a few drops of this with pure spirit of wine, a yellowish-white precipitate was formed; but when methylic alcohol was present, no such precipitate occurred. Details of the application of the test were then given. In testing flavored spirits, tinctures, etc., it would probably be desirable to distil the suspected liquid, and apply the test to the distillate. The author added that, since completing the paper, he had found that acetone was the principle which prevented the formation of a precipitate by methylated spirit.

ON THE PURITY OF SULPHATE OF QUININE OF COMMERCE.

BY MR. W. WALTER STODDART.

"The author's experiments showed that quinine, and not cinchonine, must be generally sought for as the chief impurity in commercial sulphate of quinine. After pointing out the objections to the tests of Bouchardat and Pasteur, Stokes, Herapath, Brande and Pelletier, Mr. Stoddart proposed a modification of Liebig's, and gave the details of its application. A second trustworthy and ready test, for all possessing microscopes, was sulphocyanide of potassium. If a drop of a solution of the latter salt were added to a drop of saturated and neutral solution of the suspected quinine, and the mixture observed by the microscope crystals of sulphocyanide of quinidine and sulphocyanide of cinchonine, both of highly characteristic form and wholly distinct from the sulphocyanide of quinidine formed at the same time, would be observed if either quinidine or cinchonine were present. For quantitative determination, the Reporter employed De Vry's iodide of potassium reaction, and detailed the results of his analyses of samples of sulphate of quinine from Messrs. Howards & Sons, De Lisle & Co. (Pelletiers), Mr. J. Hulle, Messrs. Herring & Co., and a German specimen. It was, he said, gratifying to be able to affirm that sulphate of quinine, if purchased in bottles or sealed packets, as sent out by the makers or obtained through well known wholesale houses, is commercially pure and quite fit for medicinal use. It was the chemist's own fault if he were not supplied with an article of sufficient purity."—*Proc. Brit. Pharm. Conf.* 1864.

ON THE RANCIDITY OF FATS. BY T. B. GROVES, F.R.C.S.

The author states the occasion of his paper to have been the observation of the preservative effect of aromatic oils on oxide of mercury ointment, which induced him to compare the relative efficacy of the various essential oils of commerce, both as regards mixed ointments and the pure fats.

After general remarks on the process of rancidification, and the theories that have been imagined to account for it, he proceeded to consider the possibility of applying remedial measures of a radical character, which he decided in the negative. The experiments on variously-prepared specimens of lard, aromatized and non-aromatized, were then detailed, and the conclusion arrived at that creasote, oil of pimento, oil of cloves, and balsam of Peru, were capable of greatly retarding, if not of altogether preventing oxidation. A comparison of the effect of these aromata in preserving these aqueous solutions of albumen, gave countenance to the theory of the cause of rancidity of fats being the disturbance effected by a ferment of the albuminous order. He concluded, by strongly urging the necessity of using for the preparation of ointments, especially those containing metallic oxides, materials retaining unaltered the odorous principles with which nature has endowed them, and suggested the advisability of adding to lard and other inodorous fats, small proportions of oil of pimento, to render them more permanent; to effect which, two drops to the ounce had been found sufficient.

SUGGESTIONS CONCERNING ACCIDENTAL POISONING.

The Members of the British Pharmaceutical Conference have had under deliberation the subject of the prevention of accidental poisoning. The result has been to convince them that most qualified dispensers of medicine already adopt precautions to this end, and they consider that the comparative rareness of mistakes shows that such safeguards are generally attended with success. It being desirable, however, that some approach to uniformity of practice should exist, the following suggestions are offered:—

1. It is recommended that all who are, or expect to be, engaged in the practice of Pharmacy, should take advantage of existing facilities for acquiring a good theoretical as well as practical knowledge of their business, as being the best foundation that can be laid for future safety, as well as usefulness, in their calling.

2. It is desirable that, where practicable, a separate and suitable part of the shop of a chemist and druggist should be set apart for the dispensing of prescriptions.

3. In the dispensing department, or other suitable place, there should be a *repertorium toxicorum*, or "poison cupboard," under lock and key, in which should be kept all the concentrated and virulent poisons. An additional protection of similar character consists in securing the stopper of a bottle by tying over or other means.

4. It is advantageous that labels on shop bottles should be visible at a glance; the words being, for instance, in two short lines, on a square label, rather than in one line on a long curved label.

5. Where practicable, every prescription should be checked by a second person before it leaves the shop.

6. It is expedient that liniments, lotions, and poisonous preparations for external use, should be sent out in such a form as to be easily distinguished, by touch as well as sight, from medicines intended for internal administration.

7. Every specially dangerous substance sold by the chemist and druggist should, in addition to its name, be distinctly labelled "Poison;" except in the case of medicines dispensed from a prescription, where the statement of the use or dose may be considered to be sufficient precaution. A label having the word "Poison" in white letters on a black ground is well adapted for the above purpose."

ON COMMERCIAL PHOSPHORIC ACID. BY R. PARKINSON, PH.D

Twenty-eight samples had been examined with reference to their strength and freedom from impurity, the result as to strength being that three samples came up to the British Pharmacopœia strength; five more were about the London Pharmacopœia strength; while the remainder were of various shades of declension. Phosphate of ammonia was present in six samples, sulphuric acid in one, nitric acid only traces in any. The presence of ammonia was considered evidence that the samples containing it had been made from the glacial acid, which, commercially, is made by heating the phosphate of ammonia, the whole of the ammonia never being practically got rid of. One sample of German glacial contained 5 per cent. of ammonia, which is equal to 17½ per cent. of tribasic phosphate of ammonia. If a pure glacial acid could be readily obtained commercially, that was suggested as the safest and best means of obtaining the dilute acid; and the combustion of phosphorus, with arrangements for the supply of air and collection of acid, was suggested as the best mode of obtaining such a pure glacial acid. Other plans for its preparation, which were detailed, had been tried, and found unsatisfactory.

ON THE ASSAY OF THE ALKALOIDS IN MEDICINAL EXTRACTS.

BY T. B. GROVES, F.C.S.

The object of the author was to devise a process for estimating the strength of the vegetable extracts used in medicine. The method he employed was a volumetric one. Mayer, of New York, and Valser, of Paris, had worked upon the same subject, and all three had fixed upon the same liquid for precipitating the alkaloid; namely, the iodo-hydrargyrate of potassium. All three also had suggested formulæ for the precipitate. Valser's experiments corroborated those of the author, while Mayer's pointed to a different conclusion. Mayer's experiments were then reviewed, and the details of some reactions given from which it seems that, on adding the iodo-hydrargyrate to the solution of the alkaloid, a point was arrived at when the addition of either liquid caused a precipitate. In this way some of the apparent anomalies might be explained. If, however, time were allowed for the completion of the reaction, more definite results might be obtained. He described the reactions with strychnia, quinine, cinchonine, morphia, nicotina, and codeia, and reviewed Mayer's results, which were quite, he said, anomalous. In estimating the amount of alkaloid in an extract, the alkaloid must first be isolated as far as possible, by Stas's well known method. In estimating the medicinal value of an extract, more exact methods than those now known must be discovered before accuracy can be attained.

ON THE PREPARATION OF AN IMPROVED WINE OF IRON.

BY H. N. DRAPER, F.C.S., AND MR. J. WHITLA.

The authors first described their observations of the action of light in promoting decomposition of the officinal wine of iron. To prevent this decomposition, which occurs even in the dark, they suggested that ammonia-citrate of iron should replace potassio-tartrate, and that citrate of ammonia should also be added to prevent any slight precipitation that might otherwise occur when the wine was exposed to strong sunlight. The formula proposed was as follows:—

Ammonia-citrate of Iron	160 grains.
Crystalline Citrate of Ammonia . .	60 "
Sherry	1 pint.

The wine thus prepared was perfectly transparent, and had no disagreeable taste.—*London Pharm. Jour.* for *October.*

ON THE DETERMINATION OF WATER IN ORGANIC SUBSTANCES.

By M. Cl. Winckler.

This determination is founded on the change of color, which anhydrous chloride of cobalt undergoes in absorbing water. Dry chloride of cobalt dissolves in alchol of a density of 0·792, preserving a beautiful blue color. Hydrated bodies, in presence of this solution, abandon their water, and the color turns to red. The operation is begun by titrating the solution of cobalt, to ascertain the quantity of it which must be added to a certain amount of water to produce a fixed color. In this way the author has determined the alcoholic strength of mixtures of alcohol and water. *London Chemical News,* from *Bulletin de la Société Chimique,* vi. 460, 64.

ON THE SOLUBILITY OF GOLD IN NITRIC AND SULPHURIC ACIDS.

To the Editor of the Chemical News.

Sir,—Since sending you the note on the solubility of gold, a chemist of my acquaintance has informed me that the information given was not sufficient to enable him to perform the experiment satisfactorily. I therefore send you a more complete account of the experiment performed by me.

The alloy of silver and gold was exposed to the action of nitric acid until the gold was left in a powder. On heating this powder with sulphuric acid a yellow solution was obtained, which, when poured into water, gave a purple precipitate. This at first led me to suppose that the sulphuric acid had dissolved some gold; so after washing, the gold was heated for some time with strong sulphuric acid, without any solution taking place; but on adding a little nitric acid an immediate yellow color was observed in the liquid, and on pouring it into water the same blue precipitate was obtained. The experiment has been repeated, and the acids were of course tested to ascertain their purity; but the solution contains the gold evidently in a different state of combination from that produced by dissolving in nitric and hydrochloric acids, for it is again precipitated by water.

A tenth of a grain was easily dissolved in this manner; but had the heat been continued no doubt a larger quantity would have been obtained in solution. I am, &c.,

ARTHUR REYNOLDS.

—*Chem. News*, Oct. 1, 1864.

Abstract of the Minutes of the Philadelphia College of Pharmacy.

At a stated semi-annual meeting of the Philadelphia College of Pharmacy, held at their Hall, on Monday evening, September 26th, 1864. Present 19 members.

In the absence of the President, 1st Vice-President, Samuel F. Troth, occupied the chair, and William C. Bakes was appointed Secretary *pro tem.* The minutes of the annual meeting were read and adopted. The minutes of the Board of Trustees were read, informing the College that the valuable cabinet of specimens of Materia Medica, formerly owned by the late Professor of Materia Medica, Dr. R. P. Thomas, was purchased by voluntary subscription among the friends of the deceased and the members of the College generally, and presented to the College as a memento of the zeal and industry of our late fellow member; also that Mr. Edward Parrish was unanimously elected to fill the vacant Professorship of Materia Medica in the School of Pharmacy, and that the following gentlemen have been elected members of the College, William H. Githens, Richard M. Shoemaker, Frederick Brown, Edwin Tomlinson, and Albert E. Ebert associate member. Professor Procter gave a very interesting account of the recent meeting of the American Pharmaceutical Association at Cincinnati, and stated that sixty new members had been received and an unusual number of original papers had been read and referred for publication. The Association adjourned to meet in Boston.

Mr. S. S. Garrigues, having removed from the city, tendered his resignation as a member of the College, which was accepted, and, on motion, he was permitted to retain his certificate.

Mr. Samuel F. Troth, in response to an invitation from the late annual meeting, read a paper on the early history of the College, prefacing it by an interesting account of Pharmacy, as practiced in this city before the establishment of the School of Pharmacy. On motion this valuable paper was referred to the Publishing Committee, and a vote of thanks was tendered Mr. Troth. It was, on motion, resolved that Messrs. Charles Ellis and Dillwyn Parrish be requested to prepare an additional paper recognizing the zeal and fidelity manifested by the late Henry Troth, during the early existence of the College. The resignation of Mr. Edward Parrish, as Recording Secretary of the College, was read and accepted, and a vote of thanks was ordered for the faithful and efficient services rendered.

The semi-annual election for Trustees, &c., was now ordered, Messrs. Jacob L. Smith and S. S. Bunting acting as tellers, who reported the following as elected:

Recording Secretary, Charles Bullock.

Trustees.

Dr. W. H. Pile,
W. J. Jenks,
Evan T. Ellis,
Edward Parrish,
George J. Scattergood,
A. B. Taylor,
J. C. Savery,
W. C. Bakes.

Committee on Deceased Members.

Edward Parrish, William Procter, Jr., Charles Bullock.

On motion the College adjourned.

William C. Bakes, *Secretary pro tem.*

Editorial Department.

British Pharmaceutical Conference.—This body met, according to adjournment, in the city of Bath, on the 14th of September last. The Minutes of the Meeting are published in the October number of the *Pharmaceutical Journal*, and are interspersed with short abstracts of the papers read upon that occasion, a number of which we have reprinted in this Journal at pages 529 to 536. The number of members present was not large, but among them were some of the most prominent pharmaceutists of England. The reading of each paper was followed by a discussion of its merits. It is to be presumed that the papers in full will be published in some form, either as a distinct annual or in the *Pharmaceutical Journal*, as the abstracts are too brief to convey a clear idea of the papers read. Much discussion arose in regard to the subject of the sale of poisons on the reception of a report on that subject.

The meeting was presided over by Mr. Henry Deane, of London, who devoted a portion of his address to the subject of the then recent trial at Liverpool, in which Messrs. Clay and Abrahams were compelled, by the construing of Lord Campbell's act, to pay heavy damages (£1500) to the family of a man whose death was occasioned by a dose of poison inadvertently dispensed from their establishment. This unrighteons verdict has produced much feeling in pharmaceutical circles in England. We have elsewhere given an account of this case, (see pages 502 and 510), and may appropriately here quote from the address of President Deane his remarks bearing upon the liability of pharmaceutists.

"The next subject I have to refer to is one the importance of which to us, as responsible persons in the sale and despensing of medicines, it is scarcely possible to overestimate.

"The result of the trials on the late case, the acquittal of the assistant, who is supposed to have dispensed the medicine, from the charge of manslaughter, on the score of its being a pure misadventure, and the unavoidable compromise with the friends of the deceased, show that every one of us is standing on a mine which may at any moment explode, and send us to pecuniary perdition and despair. It matters nothing what amount of care and expense has been bestowed on arrangements to secure the public from accident; it matters not that the proprietor of an establishment is in no way to blame, or that the patient has died through a pure misadventure, the law requires that a jury shall award compensating damages to the injured family. We all know what that means to nineteen in twenty of those following the business—it means utter ruin.

"Allow me to state our case and position in society as an important branch of what is called a liberal profession. In the first place—

"All the responsibilities of professional men are laid upon chemists without either the dignity or emolument. We are treated as shopkeepers, with profits less than those of an ironmonger.

"Rich and poor of all grades do not hesitate to consult them in all sorts of difficulties, and obtain freely and gratuitously that for which a physician or consulting chemist would charge a handsome fee.

"That the information thus freely accorded to all is truly valuable is proved by the fact of the constancy of the practice, and the needless jealonsy of many professional men.

"To obtain this amount of public confidence, a large expenditure of means, careful observation, energy, study, and integrity of purpose are required.

"The more extensive the business of a chemist, the greater the responsibility; but not so the profits.

"When the public confidence is secured, it is the interest of the chemist to maintain it by all and every means in his power.

"Foremost amongst the means are the obtaining good assistants, and making such arrangements in the establishment as shall, as far as practicable, obviate all chances of accident, and ensure the detection of errors, and the sources of them. Having done this, and exercising constant watchfulness, all that a man can do has been done. Proof of successful care is shown in the small number of known errors made by dispensing chemists.

"Thus, a man may dispense 50 prescriptions daily, on an average of 300 days in a year, equal to 15,000 prescriptions, each of which will average

10 doses, or 150,000 doses annually! He goes on thus for many years, and never has the faintest trace of an accident arising from any fault or oversight of his own, and for which he rarely gets a fair share of credit. But during those years he has probably corrected numberless errors of prescribers, many of them of no trivial nature; but for this he has no credit, professional etiquette requires he should be silent. If the skill and foresight of the dispenser were not habitually turned to such contingencies, serious accidents would frequently be recorded. Hence, the educated and careful dispenser, in the exercise of his skill, tact, and judgment, in avoiding the dangers incidental to his grave and responsible duties, is a benefactor to the community, and deserves better pay and higher consideration than the world is disposed to give. Yet a man, though gifted with clear intellect and sound discretion, and possessing a thorough knowledge of his business or profession, cannot after all claim exemption from that common imperfection of humanity—fallibility, and is not a bit less liable to error than the professedly more highly educated man who writes prescriptions, or the patient who carelessly takes up an opium liniment, and swallows it for a black draught, without exercising that common sense which we may safely state is the only true preventive of such accidents.

"No regulations could be devised nor act of Parliament enforced to prevent a physician from making a wrong mark, which might lead to fatal results, nor prevent the recurrence of such facts as the following:

"A lady of our acquaintance lately took into her hand an oval, fluted, half-pint bottle of chloride of zinc, having thereon a large red label, and 'Poison,' in large red letters, on the top of the bottle, and took a dose therefrom, instead of from a round pint bottle, having a small plain label, which she had used for two years for a soothing syrup in daily and frequent use.

"Another lady of our acquaintance went to a cupboard where medicines are kept on a middle shelf to procure a dose of fluid magnesia, but instead of taking the proper bottle standing before her face, got a chair and took a bottle of chloride of zinc from a distant corner of a top shelf, and, in spite of the red label and the word 'Poison,' took a dose, which killed her in a week.

"Such cases can be quoted by the dozen, together with numberless little inexplicable instances in daily life, of temporary absence of common sense, which serve to prove the frailty of human nature, and how powerless all rules and regulations must be to prevent their recurrence entirely.

"The case at Liverpool brings all these considerations before us in the most vivid manner. . . . Is a man to suffer destructive and ruinous spoilation because his assistant is not more than human? It is monstrous injustice. Who is safe amongst us if a ruinous prosecution is to follow an accident, however sad and fatal it may be, which may any day occur to any one of us—a class of men proverbially and necessarily careful for their own existence' sake? And who will enter a profession liable to such fatal responsibility?

"A general practitioner may, and does make numberless mistakes with impunity, because the facts are confined to himself and his own surgery. The eyes of the physician and the public are not on him or his dispenser, to stimulate to vigilance and care; thus few accidents under such circumstances ever see the light, and perhaps it is well it should be so. But cases do occasionally come before the public which contrast most favorably for the order and care exercised in every well regulated pharmacy."

The Editor of the *Chemical News*, in speaking of the meeting, says:—

"The Meeting of the Pharmaceutical Conference at Bath may be considered a decided success. A large gathering of chemists and druggists can never be expected; but we have no doubt the proceedings of the Bath meeting will conduce to the attendance of larger numbers at meetings yet to come. The abstracts of the papers we have published show that the attention of members was for the most part directed to practical matters on which they furnished sound and useful information."

We cannot but view this Association in a very favorable light, believing that it may be so conducted as to bring out a large amount of talent now latent in the British Pharmaceutical body, and tend to elevate the status of that numerous class now known as chemists and druggists. To be successful, the leading spirits will have to guard it from a tendency to learned exclusivism and titular pride; its action must be as far as possible democratic, and based on the broad principle of encouragement to merit in every class with the unremitting object of improving the actual practice of Pharmacy in every shire and town in the British Islands.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—We have devoted a large space to the Proceedings of the late Meeting of the Association, believing that the general interest existing among our subscribers will render an account of its doings acceptable. Owing to the custom of the Association of publishing its own Proceedings, we are debarred from offering any of the numerous papers that were read, until they have been printed, so that our readers will have to wait till January, at least, for a sight of them. Between twenty and thirty original articles were read, besides the Reports. The number of queries for 1865 is only seventeen, exclusive of those extended over from last year, and it will be desirable to encourage the production of volunteer papers for the Meeting at Boston, to render it an approach to the success of the Meeting of 1859, held in that city. During the last few years, New England pharmaceutists have not contributed much to the Proceedings, and in view of the Meeting being in Boston next year, we would respectfully suggest to that important part of our membership that they make an earnest effort to find the time, as we know they have the talent, to contribute a full share and over running to the interest of the Meeting in September next. The mantle of the lamented Carney should have fallen on some of his associates; perhaps it has, and that we shall learn on whom when we meet again. In recurring to the Meeting at Cincinnati, we believe the full action of the Association was curtailed by an early adjournment to make the excursion to Mill Creek Valley. The reading of important papers had to be omitted, and entrusted to a committee to decide on their suitability for publication. This course arose from the past experience of the members, that when the sessions are interrupted by pleasure-seeking, it has never been possible to get a full session afterwards. Let us, therefore, in future endeavor so to arrange the programme that we may not only enjoy social intercourse and examine interesting objects at the place of meeting, but fully digest the business that calls us together before parting for our homes. But we cannot pass from the subject without expressing the great gratification which, in common with a large number of other Members, we derived from the excursion to Mill Creek Valley, and the noble Institution for the Insane under the care of Dr. O. M. Langdon, as referred to by the resolution at page 494. The autumnal tinting of the foliage had progressed sufficiently to add its peculiar beauty to the landscape, whilst the succession of beautiful villas and cottages, which decorated every prominent point, added much to the interest of the varying scene. The principal cemetery of Cincinnati was passed on the route, but time did not permit the excursionists to enter its gate and avenues, although such had been part of the programme. Many thanks to the Cincinnati College for the pleasant reminiscences that cling to this episode of the meeting.

Therapeutics and Materia Medica; a systematic treatise on the action and uses of medicinal agents, including their description and history. By Alfred Stille, M. D., Professor of the theory and practice of medicine in the University of Pennsylvania, &c., &c., &c. Second edition, revised and enlarged, in two volumes. Philadelphia, Blanchard and Lea, 1864, pp. 1595, octavo.

In March, 1860, on the appearance of the first edition of this work, we gave the result of an examination of its pages. In again looking over this new edition, we find no alterations in the plan of the work, or in the details of its execution, which cause us to change the opinion then arrived at, that it is mainly therapeutical as a treatise, and that Materia Medica and Pharmacy are dwelt upon only so far as will give the student and practitioner a general idea of the sources, characters and history of drugs, and a bird's eye view of the pharmaceutical preparations. Yet in each of these departments there are some exceptions where the author has entered more fully either into their history or pharmacy than comports with the general plan. The arrangement of the work is therapeutical, and its great value consists in its thoroughness as an exposition of the present state of this important branch of medicine. The author differs in his manner of treating the subject from many, carefully bringing out the views of the observers and authors whose works he consults, whilst this own views are kept so out of sight that it is not easy to obtain his own opinion of the value of a medicine. Where a favorable opinion of the ability of an author is held, it is satisfactory to know just what he thinks of, or what is his estimate of the curative power of a drug based upon his own observation and experience of facts which are patent to his own practice. Should Dr. Stillé give a little more prominence to his own results and opinions in future editions, we doubt not his readers will be increasingly satisfied with his valuable pages.

Leaving for the medical journals the therapeutical part of these books, we have hastily glanced over the pages in view of their pharmacological contents. Elaterium and Podophyllum, which appear to have been overlooked in the first edition, are noticed in this, and also several new medicines, as cotton root, oxalate of cerium, zatze, saoria, ol. cadinum, etc. The position of some others is changed ; Kamela is retained under that name, whilst in the new edition of the Pharmacopœia it is called Rottlera, from the generic name of the plant yielding it. Lobelina, at page 280, vol. II., is described as "a clear volatile liquid." Our own experience with that alkaloid suggests its nonvolatility, being susceptible of ready destruction by an attempt to volatilize it. At page 170, second line from the bottom, vol. I., the word sulphuric should read sulphurous. Some singular errors have crept into the pharmaceutical articles. For instance—at vol. II., page 593, the fluid extract of dandelion is said to be made by exhausting sixteen troy ounces of dandelion by alcohol, and the tincture reduced to half a pint by evaporation! This would produce a very different preparation from that of the U. S. P. Fluid extract of buchu is said to be made with diluted alcohol, when only strong alcohol is directed. In several instances it is observed that recent discoveries are not noticed, which may, in part, be due to the author not having met with a notice of them in time for his revision. The alkaloids ecbolina and ergotina, discovered by Wm. T. Wenzell, and published originally in the American Journal of Pharmacy, in May last, and noticed in Hay's Journal for July, are not noticed, nor is any reference had to propylamina as a constituent. These instances are sufficient to show that a little more care in the pharmacological portion of the work would benefit it in the next revision, whilst there is so much that is unexceptionable that, unless looked for especially, these imperfections may be passed over unobserved. We believe it to be worth the labor it will require if the third edition, when it is called for, is rendered more full in regard to the proximate chemical composition of drugs, and the characters of the proximate principles which give them activity. It may be done without materially increasing the size of the book, and would certainly enhance its value. With these few remarks, all that the short period allowed for this notice will permit, we again recur to the great value of the work to the practitioner and student, as a store of sound medical information. The volumes are bound in muslin, for which the publishers apologize, but they have given increased care in having it well done.

Transactions of the Medical Society of the State of Pennsylvania, at the fifteenth annual session, held in Philadelphia, June, 1864. Third series, part III., published by the Society. Philadelphia, 1864, pp. 227.

The meeting from which this volume issued met in Philadelphia, in the new hall of the College of Physicians, in June last, under the presidency of Dr. Wilson Jewell, of Philadelphia, whose opening address occupies the first portion of the volume, after the minutes. Dr. Jewell's theme refers chiefly to the early medical institutions of the city of Philadelphia, more especially to the College of Physicians, into the early history of which he enters with considerable detail, giving sketches of several of the founders, Drs. Redman, Jones and Hutchinson.

The address concludes by an appropriate and feeling reference to the decease of Drs. Bache and Thomas, whose standing in the Society elicited, and deserved fully the excellent remarks of Dr. Jewell.

The great body of the book consists of the reports of the numerous country Medical Societies, of which that from the Philadelphia County Society is the longest. This report contains obituary notices of Dr. W. H. Gillingham, Dr. A. Bournonville, Dr. J. B. Haskell, and Dr. J. McG. Pugh. The volume is, we believe, brought out under the editorial superintendence of the Permanent Secretary, Dr. Wm. B. Atkinson, and is well printed on good paper.

A Comprehensive Medical Dictionary; containing the pronunciation, etymology and signification of the terms made use of in Medicine and the kindred sciences, with an appendix comprizing a complete list of all the more important articles of the Materia Medica, arranged according to their medicinal properties. Also an explanation of the Latin terms and phrases occurring in Anatomy, Pharmacy, etc., together with the necessary directions for writing Latin prescriptions, etc., etc. By J. Thomas, M. D., author of the system of pronunciation in Lippincott's Pronouncing Gazetteer of the World. Philadelphia, J. B. Lippincott & Co., 1864, pp. 704, duodecimo.

A hasty glance at this volume induces us to postpone a notice of it to our January number, that its merits, which appear to be many, may be more fully examined. So far as looked into, it appears to offer much that will prove highly useful to medical and pharmaceutical students, and especially to medical writers and lecturers, to whom the etymological and pronuncial features of the work will be especially acceptable.

Braithwaite's Retrospect of Practical Medicine and Surgery. Part XLIX., July. New York: W. A. Townsend. Pp. 300 octavo.

We owe an apology to the puplishers for omitting to notice the reception of Braithwaite in our September issue. Among the papers it contains interesting to pharmaceutists are the following:—

On the preparation of opium and its alkaloids salts, by Dr. A. B. Garrod.

On Lettuce and Lactucarium, by Dr. A. B. Garrod.

The cheapest disinfectant, by Robert Druitt, Esq., of London.

On Bromide of Potassium, by Dr. A. B. Garrod.

On chloroform and its safe administration, by Dr. Charles Kidd.

And on acid and sugar in spirituous liquors, by Dr. H. Bence Jones.

Our medical readers will be gratified by many valuable papers on surgery and midwifery, upon which subjects this number more particularly treats.