phenomenon of the aurora. It must now be observed that, on account of the physical condition of the earth's surface, the electromotor activity of the southern hemisphere must be throughout much stronger than in the northern; whence it happens, that not only on both hemispheres between pole and equator, but also between the north and south poles themselves, a continual disturbance of electric equilibrium occurs; and it is this by which the direction of the needle is determined. The narrow belt between the north and south-east trades—called by Dove the zone of calms—may be termed, for present purposes, the metecrological equator. This is known not to coincide with the geographical equator, but to oscillate slowly about a limit of 1 to 1½ degrees north of it. The *experimentum crucis* for the theory—or, as we will only term it at present the hypothesis—here adduced of the trade-winds as the source of terrestrial magnetism, would consist in establishing that the known alterations which the magnetic pole, as well as declination, gradually undergo, are accompanied by parallel changes of our magnetic equator. But work of this description cannot be accomplished by a single private individual, and I must content myself with having brought the subject forward.

### Amagat on the law of Mariotte

PROFESSOR E. H. AMAGAT has published the results of some experiments, still in progress, on the influence of temperature on departures from the law of Mariotte. The researches of Regnault have shown that this law is not rigorously obeyed by any gas excepting hydrogen; in all other cases compressibility increases with pressure, that is, when the gas approaches its temperature of ebullition. This phenomenon has received various explanations. It has been considered as resulting from reciprocal molecular attraction; it has also been elucidated by a theory which was first enunciated by Daniel Bernouilli, but has received successive additions at the hands of Joule, Krœnig, and Clausius. The theory in question takes into account not only the movements of translation of molecules, but their rotatory and internal movements, as well as the possible movements of imponderable fluids. If we admit the first explanation, then, as attraction only depends on the mean distance of the molecules, the departure from the law in any single case must be the same at any temperature, provided the initial and final volumes are the same. In other words, let V be a given volume of gas at the temperature $t$ and pressure $p$. Reduce this volume to V′ by a pressure $p'$, the temperature remaining unchanged. On heating the gas to $t$, it will expand; let P be the pressure necessary to restore the volume to V, and P′ the corresponding pressure. If the departure be only a function of the volume, it is clear that we must have

$$\frac{pV}{p'V'} = \frac{PV}{P'V'}.$$

As $\frac{V}{V'}$ is common to both sides of this equation, it is only necessary to compare $\frac{p}{p'}$ with $\frac{P}{P'}$. The author has done this in the case of sulphur dioxide, ammonia, and carbon dioxide. In the instance of sulphur dioxide—

at 14°, $\frac{p}{p'} = 0{\cdot}50838$
at 98°, $\frac{P}{P'} = 0{\cdot}50277$
} difference, 0·00561.

(This difference corresponds to an observed height of more than one centimetre of mercury.) For ammonia—

at 13°, $\frac{p}{p'} = 0{\cdot}50731$
at 97°, $\frac{P}{P'} = 0{\cdot}50402$
} difference, 0·00329.

For carbonic dioxide—

at 13°, $\frac{p}{p'} = 0{\cdot}50981$
at 97°, $\frac{P}{P'} = 0{\cdot}50402$*
} difference, 0·00210.

It appears from the preceding numbers that the departure is not only a function of the volume, but also of the temperature at which the experiment is performed. This result agrees, however, with the second theory. In fact, the *vis viva* of the molecules being greater as the temperature rises, it may be readily conceived that the loss due to their collision is relatively smaller than the augmentation of pressure on the walls of the enclosing vessel, due to the augmentation of *vis viva*, this being true even when, as the rate is accelerated, the molecular collisions become more numerous.

In a new series of experiments, M. Amagat kept the initial and final pressures as nearly as possible the same in each case, thus obtaining the influence of temperature alone. He then arrived at the following general results:—

1. That near 100°, sulphur dioxide and ammonia depart but little from Mariotte's law, yet more so than air at the ordinary temperature.
2. That near 100°, carbon dioxide is almost a perfect gas.
3. That near 100°, air exactly follows the law.

The author is convinced that the higher the temperature of liquefaction of a gas is found to be (under the same pressure), the less does it depart from the law of Mariotte at the same distance from its point of liquefaction.*—[Archives des Sciences physiques et naturelles, 139, p. 169.]

* This number is obviously a misprint.

## *SOCIETIES AND ACADEMIES*

### LONDON

**Linnean Society**, March 17.—Mr. Carruthers exhibited a section of a fossil *Osmunda* from the eocene beds of Herne Bay, in which not only the forms of the cells were preserved, but the contents of the cells, and even the starch-granules. Before its conservation it had been attacked by a parasitic fungus, the mycelium of which is preserved, in precisely the same condition as it would be in a recent specimen.—Dr. Hooker read a further communication from Sir Henry Barkly on the Flora and Fauna of Round Island. The highest point of the island is 1,049 feet above the level of the sea; the summit is smooth, with three large and remarkable blocks of granite. It is entirely composed of tufa, mixed with volcanic sand in perfectly preserved strata. The deeper ravines are crowded with lofty palms. Of the twenty-six flowering plants gathered, the greater number belong to the orders *Gramineæ*, *Pandanaceæ*, *Palmaceæ*, *Ebenaceæ*, *Cinchonaceæ*, *Compositæ*, and *Asclepiadeæ*. The proportion of Endogens to Exogens is very large, namely, twelve to fourteen; but this proportion by no means represents the enormous preponderance of the former in individuals, probably amounting to 99 per cent. Some of the Exogens are specifically identical with those of the Mauritius, but few of the Endogens; those of the former class which are common to the two islands have probably been introduced at some remote period. Of the three cryptogamic plants observed, one was a moss, probably a *Sphagnum*, one a *Selaginella*, certainly a new species, and one a widely-spread fern, *Adiantum caudatum*. Of the five grasses the most abundant is identical with the Indian Lemon-grass. The *Cyperaceæ* are represented by one species, *Scirpus maritimus*. The *Pandanaceæ* are very remarkable; *Pandanus utilis* occurs, but in one spot only, rare, and no doubt introduced, whilst the other, an allied species (*P. Vandermeerckii*, is quite peculiar to the islet). Of Palms there are no less than three species, probably all peculiar, the most remarkable being the bottle-stemmed species (a *Hyophorbe*) already described as peculiar to the island. The only other Endogen belongs to the order *Liliaceæ*, and is an aloe, growing on the summit, and probably a new species. Of *Ebenaceæ* there are three species, and two Asclepiads with trailing stems; one species of *Myrsineæ*, new; two *Compositæ*, one of them a *Sonchus*, both probably introduced; one species of *Combretaceæ* and one of *Myrtaceæ;* two *Cinchoneæ*, and a small tree about twelve feet high, resembling the *Blackwellia* of Mauritius. It will be seen that while the genera of the Round Island Flora are Mauritian, the species are mostly peculiar. It is probable that the whole group of islands—Mauritius, Bourbon, Round Island, Ile de Serpents, Rodriguez, with the smaller islets, and probably Madagascar—are fragments of a vast continent. As regards the Fauna, there are no indigenous mammalia, although goats and rabbits have been introduced and have multiplied exceedingly, and no land birds, not even the Mauritian pigeons. The island seems, on the other hand—perhaps from the absence of mammalia and birds—very favourable to reptile life. Of Chelonians, a female land-tortoise had previously been captured on the island. Four distinct Saurians were found, the largest exceeding a foot in length, a native of

* With the above results compare those obtained by Andrews (Proceedings of the Royal Society, xviii. 42).

Madagascar, but not of Mauritius or Bourbon; one species, at least, is altogether new. The four Ophidians are all undescribed, no authentic evidence being known of any such having at any time been indigenous to the Mauritius group. No Batrachians were discovered, and the time was too short to collect the Fish which abounded in the freshwater pools. Only one Gasteropod was collected, probably *Cyclostoma hemistoma*. Of Arachnida, the spiders are numerous and interesting, of four kinds, belonging to as many different families, two common to Mauritius and two not; also three scorpions, one measuring five inches, none of them Mauritian. Only one Myriapod was captured, a centipede six inches in length, belonging to India, but found also in Rodriguez. There were six Coleoptera, none of them Mauritian, though not very dissimilar. Of Orthoptera, one *Plasma*, peculiar to the island, and a grasshopper, also thought to be new. The Neuroptera included only one specimen of a dragon fly, and the Hymenoptera only a single bee. Generally speaking, the Fauna was of the type of the Malayan archipelago, with greater resemblance to that of Madagascar than of Mauritius or Bourbon. The reptiles have been sent to Mr. Gunther of the British Museum for examination and description, and specimens of the plants to the Kew Herbarium. Thus it will be seen that this little islet, not a mile in diameter, and only thirteen distant from the great island of Mauritius, is unique in respect of the peculiarity of both its animal and vegetable productions. In the matter of Ophidians it is especially so; the absence of them in other oceanic islets throughout the globe being one of the most remarkable features of their history.

**Royal Geographical Society**, March 14.—Sir R. I. Murchison, Bart., president, in the chair. The following new Fellows were elected:—Charles Ashton; William J. Anderson; Louis Alford; Charles Fairbridge; Charles W. Gray; Edward Gellatly; J. G. Gibson; T. D. Murray; Rev. W. R. Tilson Marsh, M.A.; M. the Chevalier de Overbeck; Robert T. Pigott; Albert Walker; Thomas Watson; Peter T. Wills. The President, Sir Roderick Murchison, read an official letter he had that day received from Lord Clarendon, stating that a severe outbreak of cholera had occurred in East Africa, at Zanzibar, and on the neighbouring mainland, which it was feared would delay the progress of Dr. Livingstone, inasmuch as the native carriers who were taking supplies to him had been attacked by the epidemic. Sir Roderick stated that there was little probability of the disease reaching the remote interior district where Livingstone remained waiting for the Zanzibar caravan. The following paper was read: "On Morrell's Antarctic Voyage, and on the advantages of steam navigation in future Antarctic Explorations," by Captain R. V. Hamilton, R.N. According to the author, a remarkable narrative of a voyage in high southern latitudes by Benjamin Morrell, in the *Wasp* sealing schooner, published at New York in 1832, had been hitherto overlooked by all concerned in Antarctic exploration. Even Morrell's celebrated countryman, Commodore Wilkes, seemed not to have been aware of this publication, which appeared before he sailed on his voyage of discovery. Captain Hamilton had laid down Morrell's route on a South Polar chart, and found that it intersected several times the land said afterwards to have been discovered by Wilkes. The portion of the Antarctic Ocean navigated was between 66° and 70° 14′ lat., and between 105° E. long. and the meridian of Greenwich. South of 64° he found less ice, and in 69° 11′ there was no field-ice visible. Captain Hamilton concluded that the Antarctic lands seen by Wilkes and others were mostly islands, and that one or other of them would offer a suitable site for the observation of the approaching Transit of Venus. The employment of steam-vessels, he contended, would add very greatly to the safety of the expedition as well as the facility of reaching the high southern latitudes. The great barrier of ice surrounding the South Polar lands, he believed, was not glacier ice, but an enormous floe. In the discussion which followed, Commander J. E. Davis (of Sir James Ross's Expedition) dissected many of Morrell's statements about well-known places in high southern latitudes, and showed that they were almost all pure fiction: he considered his work to be, therefore, of no authority, and denied that it had been overlooked; it had been examined by cartographers and writers, and set aside as unreliable. Mr. Enderby expressed similar opinions, from personal knowledge of Morrell, and Mr. F. Galton also exposed Morrell's inaccuracy with regard to the interior of South-west Africa. Captain Sherard Osborn differed in opinion from Captain Hamilton regarding the formation of the Antarctic icy barrier, and believed it to be the seaward edge of an enormous continental glacier. Admiral Ommaney also took part in the discussion. The meeting was then adjourned to March 28.

**Anthropological Society**, March 15.—Dr. Charnock, V.P. in the chair. Mr. William Stephens Haywood, Long Wittenham, near Abingdon, Berks; and Mr. P. Henderson, her Majesty's Vice-Consul at Benghazi, North Africa, and No. 1 Stafford Place, Buckingham Gate, were elected Fellows. Dr. Daniel Earl Burdett was elected a local secretary for Belleville, Ontario, Canada. The following paper, by Dr. Isidore Kopernicky and Dr. J. Barnard Davis, F.R.S., was read: "On the strange peculiarities observed by a religious sect of Moscovites, called Scoptsi." This curious Christian sect of a well-defined race was fully described in the paper by Dr. Barnard Davis from data supplied him by Dr. Kopernicky of Bucharest, and it was accompanied by an anatomical preparation which clearly demonstrated the character and amount of mutilation practised by the Scoptsi. That practice is based upon the twelfth verse of the nineteenth chapter of St. Matthew, and it has been carried out with such resolution and to so large an extent, that the Russian Government has been compelled to interfere and to punish with extreme severity all members proved to belong to that community. Hence, the Scoptsi are forced to conduct their worship and to carry out their peculiar rites in the most secret manner: nevertheless, they contrive to amass great wealth, and as a consequence they possess considerable influence in districts in which they reside. Accident alone brought under the notice of Dr. Kopernicky the case of the individual whose body furnished the preparation laid before the society. The paper, after entering at length into the modes of conducting the religious worship of the Scoptsi, their estimated numbers, their physical characteristics and other details, viewed the subject in its psychical aspect. Dr. Kopernicky was of opinion that this aberration in Christianity could not be explained otherwise than by the psychological peculiarity of the race of Moscovites in which it prevails. He endorsed the well-known views of the Rev. Dunbar Heath upon the difference which exists between the Semitic and "Aryan" races in their appreciation of the doctrines of Christianity, and held it to be an anthropological fact that the ideas and religious creeds, sound or absurd, moral or immoral, which are produced, or which develope themselves among a certain race, depend greatly upon the character of the psychological sentiments natural to that race. That was the reason why Christianity was so readily accepted, and has taken such root among the Aryan peoples, and why, on the contrary, the Koran has had most success and most persistence among the Semites. An animated discussion ensued, in which the Rev. Dunbar Heath, Mr. Moncure Conway, Mr. Ralston, Dr. Spencer Cobbold, and others, took part.

**Institution of Civil Engineers**, February 22.—The following papers were read:—"On the New Mhow-ke-Mullee Viaduct, Great Indian Peninsula Railway," by Mr. A. R. Terry; "On the Pennair Bridge, Madras Railway," by Mr. C. W. Stoney.

March 1.—"The Wolf-Rock Lighthouse." By James N. Douglass.

March 8.—"Description of the Line and Works of the San Paolo Railway in the Empire of Brazil." By D. M. Fox.

March 22.—"On the conditions and the limits which govern the proportions of Rotary Fans." By R. Briggs, of Philadelphia.

### DUBLIN

**Royal Irish Academy**, March 16.—The Rev. John H. Jellett, M.A., was elected president, and the following gentlemen were elected council and officers for the current year:—Dr. W. K. Sullivan, Secretary of Academy; Dr. H. Hennessy, Dr. W. Stokes, Dr. A. Searle Hart, Dr. James Apjohn, Rev. Humphrey Lloyd, D.D., Rev. S. Haughton, M.D., Rev. J. A. Galbraith, Dr. MacDonnell, Dr. E. Perceval Wright, Mr. R. S. Ball; John T. Gilbert, Librarian; William H. Hardinge, Treasurer; Dr. John Kells Ingram, Secretary of Council; Sir W. R. Wilde, Secretary of Foreign Correspondence; Rev. George Longfield, D.D., Dr. Samuel Ferguson, Dr. W. J. O'Donnavan, Dr. Alexander G. Richey, Colonel Meadows Taylor, John R. Garstin. Heinrich Ewald, of Göttingen, was elected an honorary member in the department of Polite Literature. The following grants of money were voted:—20*l.* to Dr. John Barker, in aid of his experiments on "Microscopic Illumination." 15*l.* to Mr. E. Reynolds, to enable him to carry out his researches on the "Spectrum Analysis of Chlorine," &c. 15*l.* to Mr. N. Furlong, to enable him to

carry out his experiments on the "Innervation of the Heart." Professor Hennessy read a note on "Two Streams flowing from the same source in opposite directions." The president nominated Henry Hennessy, F.R.S., William Stokes, M.D., Sir William R. Wilde, M.D., and Samuel Ferguson, LL.D., vice-presidents for the current year. The annual report was read and adopted, and then the Academy adjourned.

GLASGOW

**Natural History Society,** February 22.—Mr. David Robertson, F.G.S., vice-president, in the chair. Mr. Thomas Chapman exhibited specimens of *Venilia Maculariæ* which he had captured in June last in the Pass of Leny, Perthshire, and the Rev. James E. Somerville stated that he had taken the species in some numbers in Argyleshire, both at Loch Awe and Oban. The secretary exhibited a small collection of star-fishes, which had been forwarded from Girvan by Mr. Thomas Anderson, corresponding member.—Mr. Duncan McLellan exhibited monstrosities of the common ash and hawthorn from the Queen's Park; the former showing the twigs flattened like horns of a reindeer, the latter having its branches tortuous like a corkscrew. Both specimens presented a very unusual appearance.—Mr. Alexander Donaldson exhibited an example of malformation in the bill of a rook, regarding which Mr. Gray observed that it possessed additional interest from the fact of its showing only a partial abrasion at the base of the bill, and that it had been arrested probably in consequence of the malformation. Drawings of other malformations were exhibited by Mr. Gray. Mr. John Gilmour exhibited an unusually dark specimen of the hooded crow (*Corvus cornix*), which had the light space on the breast and shoulders very much clouded, giving the bird the appearance of a variety of the carrion crow (*Corvus corone*). Dr. Stirton exhibited specimens of *Adelanthus Carringtoni*—a Jungermannia new to science, which he had found on Ben Lawers, and other places. This moss had formerly been confounded with *Alicularia compressa*, from which, however, it differs not only in the colour and areolation of the leaves, but also in their mode of attachment to the stem. It approaches much more closely *Alicularia declusa* from Campbell's Island in the South Pacific; and as this last has been proved by Dr. Carrington to be an *Adelanthus*, it has been thought proper to refer this moss also to the same subgenus. The Rev. James E. Somerville than read a paper on *Danais chrysippus* and its food plant, *Asclepias gigantea*, with illustrative specimens from Upper Egypt. The author of this paper gave a very interesting account of this butterfly from personal observations made during a three months' residence in Egypt, and also of the plants on which it is known to feed. He likewise described the peculiar properties of the *Calotropis procera* or *Asclepias gigantea* of Linnæus—a plant better known as the apples of Sodom—a beautiful series of which, in its various stages of growth, was exhibited by Mr. Somerville in illustration of his remarks.

BOSTON

**Boston Natural History Society,** February 2.—Dr. B. Joy Jeffries states that, as at different times during the past three years he had had occasion to call the attention of the society to the physiology of accommodation in man and other animals, including birds, he would ask to be allowed to make a few remarks on a special part of the eye which is interested in, and may be employed in, accommodation. He illustrated his remarks by a series of pictures and diagrams representing sections of the human eye and a number of different animals, made through the ciliary muscle and the adjacent parts of the sclerotic, cornea and iris. From dissections made by many anatomists, and the special studies of several physiologists, it resulted that the space in the eye hitherto known as the canal of Fontana, who first described it in 1778, is now proved not to be a canal with walls, but rather a triangular space between the ciliary muscle, iris, and sclerotic or cornea, filled by a sort of mesh-work attaching the iris to the last-named membrane. This mesh-work is cut off from the aqueous humour. It constitutes the ligamentum pectinatum iridis, and is quite distinct from the circular venous sinus in the sclerotic just outside of it, which it has apparently sometimes been mistaken for it. Dr. Jeffries discussed the question as to whether it took part in the accommodation of the eye, if not in man where it seemingly could not, in the lower animals where its size increases with the decrease of the ciliary muscle. He remarked that our present knowledge of it is due to the recent researches of Drs. Iwanoff and Rollett.

*Section of Microscopy,* January 12.—Mr. Stodder referred to a communication of Mr. R. C. Greenleaf, on a specimen of *Aulacodiscus oreganus* Bail., prepared by Mr. Samuels, which in the process of mounting separated into two plates; one being the outer, and the other the inner plate of one valve. A few days since a similar thing happened to Mr. Samuels when mounting another specimen of the same species. The diatom separated into two pieces, the inner and outer plates of one valve as Mr. Samuels supposed. But a careful inspection of the specimen which was exhibited to the section, indicated an entirely different origin. One disc was a perfect *A. oreganus*, with all the characters of that species, having ten rays, and "feet." The other was more hyaline, the umbilicus less distinct, the granules and "feet" imperfectly developed, and having eleven rays and "feet." Mr. Stodder's explanation of the appearances—if Mr. Samuels was not mistaken as to the facts—is that the one disc is the parent, and the other a valve of a new frustule, which was forming in the process of self-division, the growth of which was stopped before it had come to maturity. Ehrenberg and some other naturalists have made the number of rays in such forms a specific character; Bailey and others have rejected this principle of classification, but here for the first time we have positive evidence that a form with eleven rays has been derived directly from one of ten rays. Such a change of characters in one order of plants being authentically established, it is a reasonable inference that all other orders may be liable to similar changes, and therefore great caution should be used in allowing specific value to unimportant characters.

January 26.—*Section of Entomology.*—Mr. E. Burgess in the chair. Twelve persons were present. Mr. F. G. Sanborn exhibited a drawing of the larva of *Callosamia promethea*, made by the late Mr. C. A. Shurteff, together with the specimen after it had spun its cocoon. Dr. H. Hagen read a criticism of the views of Dr. Packard concerning the *Neuroptera*, as given in his recently completed "Guide," and explained that in the manuscript of his own "Synopsis of North American Neuroptera" he had, in accordance with the views of the most prominent entomologists for twenty-eight years, distinctly separated the Pseudoneuroptera and Neuroptera as two different parts of the work. Dr. Hagen also remarked that Mr. Fritz Müller had sent to him some white ants from Itahahy, St. Catharina, Brazil, with the following remarks:—"These nests of white ants are more or less regular cylinders, one span high and two or three inches thick. By horizontal floors they are divided into twelve or fifteen compartments or chambers. The outer surface bulges out so that one can make out the number of chambers by the enlargements of the cylinder. A pillar goes through all the compartments; close to this, or in it, runs an oblique passage from each chamber to the next. Sometimes all these passages together form a somewhat regular winding stair through all the compartments. For the impregnated female these passages are too narrow, and she can therefore not leave her chamber. There are, both in the outer wall and in the horizontal divisions, passages too small to admit the passing of the winged ants; but neither in the outside wall nor in the chambers is there any opening to the outside in nests which have not been injured. In the outside wall the passages run from top to bottom. In the divisions, from circumference to centre without reaching this latter. In the flat compartments they are not to be detected from the outside; in the circumference they appear as flattened ridges. In drying, the outer side of the passages falls off, and then they are to be seen as deep hollows with inflated borders. In undisturbed nests the only entrance seems to be on the upper surface some inches under ground. The nest is not directly connected with the earth, but is surrounded by about a finger's breadth of free space. The nest can, therefore, as soon as the upper end is freed from earth, be easily taken out of the ground. I have never found in one of these nests more than one impregnated female. Besides the winged ants, the eggs, and the larvæ, there are found two kinds of labourers; of these, one kind is distinguished by a truncated nose. Not in the nest, but in the same piece of land, are found, in planting corn, single white ants with disproportionately large heads and long mandibles." The winged ants were stated by Dr. Hagen to belong to *Termes striatus*, or perhaps to *T. similis*; the imago is in too bad a condition for accurate determination. The soldier with truncated nose was figured by him as *T. similis*; the soldier with long mandibles as *T. cingulatus*. No description of white ants' nests like this has ever been given before.—Mr. S. H. Scudder remarked that in a recent examination of the external genital armature of our diurnal *Lepidoptera*, he had

noticed the extraordinary fact that in the males of the North-American species of the genus *Nisoniades*, these organs were asymmetrical. The asymmetry is confined to the lower lateral plates, which are unusually developed in this genus, and shows itself in the diverse length of the lower process and in the size, and the entireness or the excision of the lateral flap. The only species in the genus, as generally accepted, which does not come under this rule, is *N. Catullus*, but the structural features of all the appendages of the body of this species show that it is wrongly placed in this relation. Mr. Scudder also stated that the butterfly described by Dr. Harris in his State Report as *Eudamus Bathyllus*,—a name invariably accepted by subsequent writers—was not the species originally described and figured by Abbot and Smith under the same specific name; he therefore proposed to call Harris's species *Eudamus Pylades*. Mr. Sprague referred to an instance related by a friend not versed in entomology, where "flies" were seen, through a hole in the ice in midwinter, to ascend in large numbers from the bottom of a stream to the surface and take flight. Mr. B. P. Mann stated that he had taken a specimen of *Carabus Chamissonis* Fisch., in Labrador. Mr. F. G. Samborn remarked that he had taken ten or twelve specimens of the same species in August, on the sides of Mount Washington, N.H., at a height of from four to five thousand feet above the sea. He also reported the capture in Andover, Mass., on Christmas Day, 1869, of *Capnia* and *Taeniopteryx*, moving actively upon the ice; of several *Staphylinidæ* of the genera *Lathobium*, *Stenus*, *Philonthus* and *Lithocharis*, together with *Photinus corruscus* and larvæ of *Telephorus*, and some undetermined Coleopterous and Geometrideous larvæ, also a species of *Salda* (Hemipterous), and of *Diptera*, *Hydrophorus pirata* Loew, and *Sepsis sp.*, which were struggling in water of about one-eighth inch in depth, covering the surface of the ice in meadows. A great number of *Arachnidæ*, mostly of small size, were noticed under the same circumstances, and appeared to represent many species. He was in pursuit of the aberrant forms, *Boreus* and *Chionea*, but several hours of careful search failed to reveal any specimens of either.

### PARIS

**Academy of Sciences**, March 21.—The following papers relating to various departments of physics were read: A note on the variations of the calorific capacity of water towards the maximum of density, by M. Hirn; on the angle of adjustment of a liquid with a solid wall, by M. Moutier; a description of a vertical galvanometer with a balance, suitable for use before large audiences, by M. Bourbouze.—The chemical papers were rather numerous, and included a note on the analysis and uses of the rock known in the Ardennes under the name of *gaize*, or *pierre-morte*, by MM. H. Sainte-Claire Deville and J. Desnoyers, upon which M. Elie de Beaumont made some remarks.—A note by M. Descloiseaux upon some crystallised derivatives of the coal hydrocarbons; a memoir on the action of sulphuret of carbon and carburetted gases upon wood charcoal, by M. Sidot; a note on cobalt and manganese and their alloys with copper, by M. A. Valenciennes; a note on a new method of preparing hydrobromic acid, by MM. Champion and Pellet; a note on the properties of iodic acid, by M. A. Ditte; one on the hydrogenated derivatives of sulphuret of carbon, by M. A. Girard; a note on the vitality of beer-yeast, by M. Melsens; an important note by M. J. Raulin on the chemical conditions of the life of the lower organisms; a paper on tribromhydrin, by M. L. Henry; and a note on the isomeric xylenes and cumenes in the coal-oils, by M. Rommier.—M. Rosenstiehl also presented a paper on the nature of the motor force which produces the phenomena of endosmose; and M. E. Martin an electro-chemical investigation of ozone.—M. Blanqui forwarded a letter describing an instrument for solving spherical triangles without the aid of tables of logarithms; and M. Bowen a continuation of his communication relating to the distance of the sun, of which the titles only are given.—M. Chasles made known a theorem relating to the theory of surfaces which had been communicated to him by Mr. Spottiswoode.—M. Coumbary's notice of the fall of an aerolite in Barbary (given in our last number) was communicated by M. Le Verrier, who also presented some observations on storms in Norway during the year 1869, by M. Mohn of Christiania.—With the exception of a few medical miscellaneous notes, three botanical papers complete the list of communications at this meeting: these were the continuations of M. Trecul's and M. Chatin's valuable researches upon the tracheæ of ferns, and the causes of the dehiscence of anthers (the latter completed), and a notice of a remarkable case of subdivision of the top of a palm-tree, by M. Ramon de la Sagra.

## DIARY

*THURSDAY*, MARCH 31.

ROYAL SOCIETY, at 8.30.—On the relation between the Sun's Altitude and the chemical intensity of total daylight in a cloudless sky: Prof. Roscoe and Dr. Thorpe.—On the acids contained in Crab-oil: Mr. W. J. Wonfor.
SOCIETY OF ANTIQUARIES, at 8.30.—On the Crypt of the Chapter-house at Westminster: H. Harrod, F.S.A.
ROYAL INSTITUTION, at 3.—Chemistry of Vegetable Products: Prof. Odling.
LONDON INSTITUTION, at 7.30.—Geology: Dr. Cobbold.

*FRIDAY*, APRIL 1.

ROYAL INSTITUTION, at 8.—Artificial Alizarine: Prof. Roscoe.
ARCHÆOLOGICAL INSTITUTION, at 4.

*SATURDAY*, APRIL 2.

ROYAL INSTITUTION, at 3.—The Sun: J. Norman Lockyer, F.R.S.

*MONDAY*, APRIL 4.

LONDON INSTITUTION, at 4.—Chemistry: Prof. Bloxam.
ROYAL INSTITUTION, at 2.—General Monthly Meeting.
ENTOMOLOGICAL SOCIETY, at 7.
MEDICAL SOCIETY, at 8.
ROYAL ASIATIC SOCIETY, at 4.
VICTORIA INSTITUTE, at 8.—On Comparative Psychology: E. J. Morshead.

*TUESDAY*, APRIL 5.

ANTHROPOLOGICAL SOCIETY, at 8.—Phallic Worship: H. M. Westropp: —The Influence of the Phallic Idea in the Religion of Antiquity: C. Staniland Wake.
ROYAL INSTITUTION, at 3.—Nervous System: Prof. Rolleston, M.D., F.R.S.
INSTITUTION OF CIVIL ENGINEERS, at 8.—Discussion on St. Pancras Station.—On the Dressing of Lead Ore: Thomas Sopwith, jun., Memb. Inst. C.E.

*WEDNESDAY*, APRIL 6.

SOCIETY OF ARTS, at 8.

*THURSDAY*, APRIL 7.

ROYAL INSTITUTION, at 3.—Chemistry: Prof. Odling.
CHEMICAL SOCIETY, at 8.—On the Analysis of Deep-sea Water: Dr. John Hunter.—On the refraction equivalents of the aromatic Hydrocarbons and their derivatives: Dr. J. H. Gladstone.—On an acid Feed-water from the Coal-fields of Shellarton, N.S., and the results of its use: Prof. How.
LINNEAN SOCIETY, at 8.—On new species of Annelids, &c.: Dr. Baird.—On Algæ from the North-Atlantic Ocean: Dr. Dickie.

## BOOKS RECEIVED

ENGLISH.—A Poor Man's Photography at the Great Pyramid: Prof. Piazzi Smyth (H. Greenwood).—The Week of Creation: G. Warington (Macmillans).—The Philosophy of the Bath: D. Dunlop (Dublin, Moffat).—The Fuel of the Sun: W. Mattieu Williams (Simpkin, Marshall, and Co).

FOREIGN.—Grundzüge der Modernen Chemie: Dr. Eugen Zell, Organische Chemie (Berlin, Herschwald).—Grundriss der Physik und Meteorologie: Dr. J. Müller (Brunswick, Vieweg).—L'Année Géographique; révue annuelle: M. Vivien de Saint-Martin (Paris, Hachette).—Reden und Abhandlungen über Gegenstände der Himmelskunde: Dr. J. H. von Mädler (Berlin, Oppenheim).—Jahresbericht über die Fortschritte der Chemie: Adolph Strecker, für 1868, 1tes Heft (Giessen, Ricker).—Charles Darwin und Alfred Russel Wallace: Dr. A. B. Meyer (Erlangen, Befold).—Die Stellung des Menschen in der Natur; 2te Lieferung Wer sind wir: Dr. L. Büchner (Leipzig, Thomas).—Zeitschrift der Gesellschaft für Erdkunde zu Berlin, 4ter. Band: Prof. W. Koner (Berlin, Reimer).—Studien über die Wanderblöcke und die Diluvialgebilde Russlands: C. von Helmersen, 10 Tafeln (St. Petersburgh, Eggers). Through Williams and Norgate.——Cryptogamie Illustrée, ou Histoire des Familles naturelles des Plantes Acotyledonées d'Europe: Casimir Bourneguère (Paris, Baillière).—Gedachtnissrede von Alexander von Humboldt: C. G. Ehrenberg (Berlin, Oppenheim).

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