

Miscellanea.

ABSTRACT OF A MEMOIR ON THE METALLIFEROUS (GOLD) DEPOSITS OF BRAZIL. BY WILLIAM JORY HENWOOD, F.R.S., F.G.S., &c. &c. &c.*

[*Edinburgh New Philosophical Journal, January 1851.*]

THE gold-bearing strata consist of granite talcose and clay slates, and a granular rock of quartz and talc, locally called Itacolumite,† in which the latter is sometimes replaced by oxide of iron. These are followed by the *Jacotinga*,‡ the principal auriferous rock, which is for the most part composed of specular iron-ore and oxide of manganese, but sometimes contains talc, mica, and quartz also. A rock very closely resembling that beneath the *Jacotinga*, but generally rather less quartzose, succeeds: and this is overlaid in many places by calcareous strata. No organic remains have yet been found in any of these formations. The gold is either disseminated through the rock, and in the short unconnected strings and masses in and forming integral parts of the strata—in much the same manner as tin ore occurs at Carclaze, and in the small veins at Balleswidden, Beam, St. Agnes, and Drake Walls; or disposed in veins or vein-like masses as it is at Candonga, Morro Velho, Gongo Soco, Cocaës, and Bananal,—or again, in a rounded, sandy, or gravelly state, mixed with other detrital matter, in which case, as in that of our stream-tin, the quality is far superior to that of the metal obtained from mines. A fourth mode of occurrence owes its origin to the workings on the other three, for it consists of the finer and lighter particles which escape during the extraction and cleaning of the gold obtained from the strata and veins, and which are often carried by the rivers several miles before they subside. This is obtained from the present beds of rivers; and after heavy floods, it is also collected from the grass and brush-wood which clothe their banks; but it is wrought only by the very poorest classes, and seldom yields them more than a very few pence a day. A rich sample of gold taken from the crop of a duck which fed in one of those streams was exhibited, and this, though very rare, is not a sole instance of the kind. The writer once saw the sand and earth scraped by children from

* Read before the Royal Geological Society of Cornwall, 27th September, 1850.

† From the mountain Itacolumy, near Ouro Preto, which is composed of it.

‡ From its resemblance in colour to the plumage of a well-known Brazilian game-bird so called.

between the paving-stones in the street of Itabira for sake of the gold they contained. The mine of Gongo Soco, worked in the *Jacotinga* formation by an English association, afforded its riches so near the surface, that the extraction of gold was begun on the third day of its prosecution, and it continues to be wrought, though on a very reduced scale, to the present time. In the month of September 1829, there were 759 lbs. of gold obtained, of which 296 lbs. (or nearly £12,000 worth) were extracted in two days; and during twenty-four years, more than 33,000 lbs. weight, worth about one million and a quarter sterling, have been taken out, and yielded a very considerable profit.—The mine of Morro Velho, also carried on by an English company, at present yields auriferous pyrites only; but though it contains only about half an ounce of gold in the ton of ore, it is nevertheless so extensively wrought that it gives from 200 to 250 lbs. of gold a month, and has for several years past left a large profit to the adventurers.

The proportion of gold extracted from the *strata* he estimates at two-fifths of the whole.

The proportion of gold extracted from the *veins* he estimates at one-half of the whole.

The proportion of gold extracted from *stream-works* and beds of rivers he estimates at one-tenth of the whole.

The first discovery of gold known to the Portuguese authorities was in 1695; and from that time to the end of last year, the writer calculates by the aid of Eschwege's work on Brazil, and by assistance of the Government officers, that sixty-three millions sterling worth of gold had been extracted from the Brazilian gold workings. To the end of 1846 (the latest returns he had access to), the Russian gold washings had yielded about twenty millions; and Sir Roderick Impey Murchison considers the returns from California as one million and a half per annum. The latest Russian accounts show a produce of more than three millions annually, and they, as well as the Californian, are still on the increase. The value of Brazilian workings seems never to have much exceeded one million a year, and it has for a long time been on the decline; the present produce is calculated by the best authorities at about 6000 or 7000 lbs. of gold per annum, worth from £220,000 to £270,000; of which about one-half is extracted from mines worked by British skill and capital.

The gold of Candonga, Gongo, and Bananal is alloyed with palladium, as well as with some silver, and a little platina; at Fazendao it is mixed with native copper, and this is probably the case in several other mines; at Morro Sao Vicente, large quantities of tellurium are mixed with the gold; and the sulphuret of bismuth was occasionally found at Catta Branca. Crystallized gold is rare, but the little which occurs is chiefly obtained from the present beds of rivers; whence, like our own crystalline minerals, it is doubtless derived from the shallower portions of the veins or strata. Iron ore of the richest description occurs in inexhaustible abundance; and the only circumstance which can interfere with that metal becoming hereafter the staple of Brazil, is the indiscriminate destruction of the forests, and the absence of coal.

The author never saw a regular cross-vein in any part of Brazil, but was informed by an intelligent German engineer, Mr. Von

Helmreichen, that wide granitic cross-veins traversed the gold vein at Candonga.—With the assistance of Eschwege's Statistical Accounts, he estimates the number of labourers employed in extracting gold at about 13,000, of whom perhaps 10,000 are slaves, and the remainder freemen; and, comparing their numbers with the produce of their labour before mentioned, it appears that each person collects on an average only about twenty pounds sterling worth of gold in the year. So small a return must long since have led to the abandonment of this pursuit were it not for the extremely cheap manner in which the natives and their slaves are supported;—and for the stimulus afforded by the immense prizes even yet found by the more fortunate miners. Still, with every possible allowance, it appears that capital may be invested in our own mines with far greater chances of success than are offered by the Brazilian gold workings.

About 2000 slaves are employed in the Anglo-Brazilian mines; of whom, perhaps, 1200 are the property of the companies; the remainder are hired from native slave-owners; they are all well fed, clothed, and housed. But notwithstanding our laws prohibit British subjects from *purchasing* negroes, it is deeply to be lamented that they are silent on the subject of *hiring*; a circumstance still taken ample advantage of by too many of our countrymen, who thus supply themselves with slave labour, and thereby give the African slaver countenance and encouragement; whilst they as directly contribute to the profit of his abominable traffic as if they had been actually buyers.

A short experience will satisfy an unprejudiced observer that the emancipation of the slaves without previous training in self-control, and in the arts and duties of civilized life, is rather inflicting mischief by setting at large a savage who will return to barbarism, than conferring a benefit or raising a fellow-creature in the scale of humanity. The author, soon after his arrival, established a place of secure deposit for those blacks who wished to economize their earnings; founded a system of rewards amongst them for the finest poultry and pigs;—for the most neatly kept gardens;—the cleanest houses, and for the best general conduct;—opened a school for the negro children, and added to the number he found already learning handicrafts.—A strong spirit of emulation was soon excited amongst them; and subsequent observation showed that many of the slaves might with equal safety and advantage be entrusted with absolute freedom. Several adults were therefore emancipated; and the excellence of their subsequent conduct gave gratifying proof that the care and culture bestowed on them had not been in vain. A similar boon was also conferred on many children of parents, who, though themselves still slaves, gave evidence that their offspring would be brought up in habits of order, sobriety, and industry.—Where the dominant race counts less than one-fourth of the number of its captives, a social revolution cannot be far distant; and we hope the free population of so vast an empire will see and profit by an example which, if regarded in time, may at the eventful period peaceably effect that change, which must be otherwise brought about by a catastrophe too horrible to contemplate.—It is a fact well known in the interior of Brazil, that the greater scarcity and higher price of slaves now than formerly, ensures that unfortunate race much better

treatment at present than they received when their loss could be supplied from the market at the low rate which anciently prevailed; a fact acknowledged by every native slave-owner. This scarcity, greater value, and increased comfort are all the results of our blockade; and thus the blessing of British humanity is daily felt by the captive in the remotest corner of Brazil.

[This paper was of very great length, and contained numerous descriptions of mines and scenery; it was illustrated by an extensive and beautiful suite of gold specimens on the table.]

ON THE MINERALS OF THE AURIFEROUS DISTRICTS OF WICKLOW.
BY WILLIAM MALLETT, ESQ.

[*Edinburgh New Philosophical Journal, January 1851.*]

THE circumstances attending the original discovery of native gold in the beds of some of the streams in the county of Wicklow have been already often detailed, and will, therefore, need but a brief repetition. The source of the auriferous streams is the mountain Croghan Kinshela, whose summit forms a portion of the boundary between the counties of Wicklow and Wexford. The stream from which most of the gold has been obtained rises on the north-east side of this mountain, and then flowing down one of the glens with which that part of the country is intersected in almost every direction, joins the Aughrim River, a little above the confluence of the latter stream with the Avonmore. It receives several smaller streams at different parts of its course, in all of which *some* gold appears to have been found, though in general in such small quantity as not to repay the cost of its extraction.

Although this part of the country, since it has been known to be auriferous, has been an object of some attraction to mineralogists, but little attention seems to have been directed to the other minerals which are to be found accompanying the gold in the alluvial deposits. These, however, are interesting, not only from their number and variety, but also from the occurrence amongst them of some of the rarer species, which do not appear to have been noticed in any other locality in Ireland. The following minerals were obtained from a considerable mass of sand and gravel taken from various parts of the bed of the principal stream:—Gold, platina, tinstone, magnetic oxide of iron, micaceous iron, red iron ochre, hydrous peroxide of iron, common clay ironstone, iron pyrites, titaniferous iron, wolfram, oxide of manganese, copper pyrites, galena, sulphuret of molybdenum, sapphire, topaz, zircon, garnet (two varieties), quartz, prase, augite, chlorite, felspar, mica.

The author has since observed, in addition to those here mentioned, arsenical iron, in small fragments, and also spinelle. The latter occurs in very small grains along with the second variety of garnet, from which it is readily distinguished by its peculiar purplish-red colour.

Gold.—This mineral occurs here in probably its most beautiful form. It possesses the true golden yellow colour and metallic lustre which characterize the metal, and, owing to the attrition to which it has been subjected, generally presents a beautifully brilliant surface. It occurs in grains of all sizes, from the smallest spangle up to a mass weighing 22 ounces, the largest hitherto found. The specific gravity of some small grains Mr. Mallet found to be 16·342. The analysis of these grains gave—

Gold	92·32
Silver	6·17
Iron.....	·78
	<hr/>
	99·27

This is equivalent (neglecting the iron) to $8\frac{1}{4}$ atoms of gold and 1 of silver.

Platina.—Mixed with the gold are some very small flattened grains of a white colour and metallic lustre, which, as far as their minute size permitted an examination, appear to present all the characters of platina. They are infusible before the blowpipe, and insoluble in nitric acid, but dissolve in aqua regia. Their occurrence, intermixed with the gold when all other minerals have been washed off, is a proof of their high specific gravity.*

Tinstone.—The occurrence of this mineral in the sand is mentioned by Weaver in his reports on the gold-stream works, but he does not seem to have been at all aware of the large quantities in which it exists. From the comparatively small portion † of sand which the author had an opportunity of examining, he obtained about $3\frac{1}{2}$ pounds of stream tin; a portion of which being reduced, yielded an ingot, which, when refined by a second fusion, is hardly inferior to the finest grain tin. ‡ Should this mineral be found in the mass of the sand in a quantity at all approaching that in which it existed in the specimen from which this was obtained, it would probably richly repay the labour and expense of its collection and smelting. From the small quantity in which other minerals of high specific gravity exist in the sand, and the constant supply of water, very little difficulty would be experienced in separating it from the rest of the sand: and the almost total absence of arsenic and lead would render it extremely easy to obtain from it metallic tin of the very first quality. The mineral itself occurs in grains varying in size from fine sand up to pebbles of half an inch in diameter, and in the most part of a dark brown colour, with some fragments of various tints of yellow and red; some presenting the peculiar appearance to which the name “wood tin” has been given. All these varieties are slightly translucent, some of them highly so. Many of them

* It is to be wished that the existence of platina had been more fully ascertained.—*Ed. Phil. Mag.*

† The exact weight of the specimen examined the author does not know, but thinks it certainly did not exceed 150 lbs.

‡ The specimen smelted in this experiment yielded about 61 per cent. of tin; but more would be obtained on the great scale, as in this case no pains were taken to extract the tin remaining in the scorias.

present distinct traces of the obtuse octohedron, the same with a short four-sided prism interposed between the two pyramids, and the latter of these with various truncations of its angles and edges. The specific gravity of some picked crystals was 6·753. A careful analysis of this tin-stone gave as its constituents—

Peroxide of tin	95·26
Peroxide of iron	2·41
Silica	·84
	98·51

The greater number of the minerals here enumerated are mentioned by Mr. Weaver in his reports to Government on the district, and which are to be found in the Transactions of the Royal Dublin Society; but some of them, the author believes, have not been noticed before, at least he has seen no published account of the occurrence in this locality of platina, titanite iron, sulphuret of molybdenum, topaz, zircon, the small magnesian garnets, or augite. Hence it seemed interesting, while noticing these, to collect into a uniform and, as far as possible, complete list, all the scattered notices of the mineral wealth of this particular district, which are to be found in Mr. Weaver's papers already referred to, and elsewhere.

The principal point, however, with respect to the examination of these minerals, which appears to merit further and more particular attention, is the fact of the existence of tin-stone in such considerable quantity in these auriferous streams: a fact which would seem to indicate the probable existence somewhere in the surrounding district of masses of the ore of this valuable metal of great extent, and possibly forming the continuation, on this side of the Channel, of those vast deposits which have contributed to furnish occupation and support to the inhabitants of Cornwall for more than two thousand years *

NEW THEORY OF POLAR LIGHTS. BY J. A. BROUN, ESQ.

MAIRAN, and, more lately, DALTON, have explained this phase of the aurora by a hypothesis of polar beams, long fiery rods of solar atmosphere, according to the one, of red-hot ferruginous particles, according to the other, seen in perspective, as they lie in the direction of the magnetic force. A little acquaintance with the phenomenon—the rushing and tilting of the beams against each other, one beam occasionally rising from the horizon, passing through the centre of the crown and beyond it—would show the improbability of this

* Transactions of the Geological Society of Dublin.

hypothesis. I am persuaded, that the phenomenon of the corona borealis is produced in a narrow horizontal stratum of the earth's atmosphere. Thanks to the discoveries of Dr. Faraday, we do not require a ferruginous sea in order to have polarized particles; the watery crystals that inhabit the upper regions of the atmosphere can themselves assume a polar state, determined by the passage of electric currents; and we have only to complete this fact by a hypothesis of luminous electric discharges seen refracted by these crystals, the position of visibility of the refracted rays depending on the angles of the crystals, and the deflections from the direction of the magnetic force which they suffer, by the electric currents. Such an hypothesis, which occurs at once when an optical phenomenon has to be accounted for, would explain these remarkable auroral clouds, so often seen in connection with the aurora itself; it would also serve to explain the appearance of the arch at certain altitudes, lower for lower altitudes, determined by the position of the source of light, direction of the magnetic force at the place, and the effect of the electric current in deflecting the crystals. The crystals successively deflected by electric currents would also exhibit the rushing pencils or beams.

It need scarcely be remarked, that differently-formed crystals might give rise to different phases of the phenomenon; while reflection might be combined with refraction in certain cases, especially in the case of arches seen south of the anti-dip. Such an hypothesis evidently assumes a source of light, independent of these optical resultants, and the pulsations seen in many auroræ may be real luminosities.

It is hazardous, in the present ill-arranged state of auroral observation, to offer so rude a sketch of a new hypothesis, although we may suffer a considerable defeat in very good company.—*Edinb. New Phil. Journal, January 1851.*

RESOURCES OF RUSSIA.

THE metallic produce of the Russian empire in 1848 was, according to the official returns, as follows, viz:—1826 poods of gold; $\frac{1}{4}$ pood of platinum: 1192 poods of silver; 254,569 poods of copper; and 8,513,673 poods of wrought iron. The pood is equivalent to a little more than 36 lbs. avoirdupois. The gold from Russia, therefore, represents a value of £3,944,832, making allowance for the English alloy.—*Edinb. New Phil. Journal, October 1850.*

ON THE REPRODUCTION OF LIMBS AFTER AMPUTATION IN THE HUMAN SUBJECT. BY DR. SIMPSON.

DR. SIMPSON showed that the power of reproducing and repairing lost parts was greatest in the lowest classes of animals, and decreased as we ascended higher and higher in the scale of animal life. He then pointed out that the human embryo approached in this, as in other respects, the physiological life and powers of the lower animals; and, consequently, when the arm or leg was amputated during embryonic existence, as not unfrequently happened from bands of coagulable lymph, and the results of disease, the stump structures reproduced a small rudimentary hand or foot—as the crab or lizard does. He showed various casts and drawings of cases of hands thus reproduced; and two living examples were exhibited.—*Proceed. Brit. Association, 6th August 1850.*

ON THE GEOGRAPHICAL DISTRIBUTION OF HEALTH AND DISEASE AS INDICATED BY NATURAL PHENOMENA. BY MR. A. KEITH JOHNSTON.

SINCE the time of Hippocrates a belief has existed that the development of the moral and physical faculties of man is dependent, not on original organization only, but also on the atmosphere by which he is surrounded, and the nature of the soil on which he is reared; and modern researches in physical geography, combined with statistical investigations in medical science, have confirmed this opinion. Sweden furnished the first tables of mortality; since then England, France, Prussia, and the United States of America have each contributed systematic statistical returns; and thus a vast mass of material has been accumulated, from which valuable conclusions may be deduced, especially since it is known that, during a similar series of years, the same diseases reappear with the most astonishing regularity, both as to periodicity and extent, and with reference to moral as well as physical causes.

The charts exhibited showed that endemic fever, including remittent and intermittent fever, prevails in North America, the West India Islands, the west coast of Africa, Syria, South Italy, the Ionian Islands, and in general in the low marshy districts of warm countries. Yellow fever is endemic in North America and the West India Islands, between latitude 5° and 40° N., its northern limit in Europe being the latitude of Gibraltar. Diseases of the digestive organs are most prevalent in India, West and East Africa, the Cape of Good Hope, England, Guiana, &c. Disease of the liver greatly predominates in the East Indies; while consumption is most conspicuous in Great Britain, Newfoundland, Canada, and Jamaica.

Dropsy is most prevalent in West Africa, Great Britain, and Guiana. Among the different countries the most striking contrasts are sometimes exhibited: thus, the west of Africa is to Europeans the most fatal; while the south-east is the most healthy country in the globe.

Although many causes besides that of climate contribute to produce these results, yet generally, both in countries and in cities, the chances of longevity are greatly in favour of northern latitudes. Of the former we find near the bottom of the scale, Java, as indicated by Batavia; some of the West India Islands, Sicily, Naples, &c.; and near the top, Norway and Sweden, and portions of England. In all cases cities are less healthy than rural districts. Of these the lowest is Vienna, and the highest London. From these results it appears that a cool or cold climate near the sea is the most favourable situation for health and longevity. Among the causes of mortality not dependent on climate may be noted:—1. Poverty and want among the lower classes of a community; 2. Close and ill-ventilated lodgings, whether in hospitals, prisons, or private dwellings; 3. Unhealthy or excessive labour, especially in youth; 4. Intemperance and dissolute habits; and, 5. War.

The proportion of deaths from consumption in different countries indicates how little mere climate has to do with the extent of this disease; since, while it is almost unknown in the Madras Presidency of India, it is more frequent at the Cape of Good Hope than in the northern States of America, nearly even in Britain and in British North America, nearly the same at Gibraltar as in the West Indies generally, and more fatal among European troops in Jamaica. Remittent fever shows an almost regularly progressive increase with the increase of temperature from the North States of America to Jamaica, where the deaths among Europeans amount to 102, and among the black troops, only 8 per 1000. Of diseases in the digestive organs, in the United States the number of cases is 526, and deaths 14 per 1000; while in Britain the cases are 95 per 1000, and the deaths only 1 in 2000 of the population.

Rheumatism is most prominent in Britain, and least in Malta. In Asia it is least among Europeans in the Tenasserim provinces, and greatest in the Madras.

The influence of climate is most powerfully evinced in the mental and physical degradation produced by malaria on the inhabitants of the moor and marshy districts of tropical regions; but, even in Europe, its effect on the amount of mortality is much greater than is generally understood. Thus in the smiling plains of southern Italy the rate of mortality is nearly twice as great as in the cold region of Scandinavia; and this proportion appears to be held in all countries.

Temperature alone has a great effect on the production of disease; the Registrar-General calculates that a fall of the mean temperature of the air from 45° to 4 or 5° below zero, destroys from 300 to 500 of the population of London.

In order to judge of the effects of the climate it is necessary to compare the amount of sickness and mortality among the indigenous population of a country with that of strangers to the soil. Now, we find that in all India the average amount of mortality

among European troops is nearly three times as great as among natives; that while seventy-five per cent. of the European troops died at the Gamola, the mortality among the black troops was little more than two per cent.; that the number of deaths from cholera in India is twice as great among Europeans as among natives; that the native troops in Bombay are as healthy as the British troops are in England. These comparisons will be found to be confirmed in all the other colonies.

Perhaps the most striking result exhibited by the tables or diagrams is the great amount of mortality among the military as compared with the naval service, or with the civil population of a country. When it is remembered that the former are selected with a special view to health, while the latter are taken promiscuously, an opposite result might have been anticipated. In Britain the number of deaths among the troops, generally, is 15 per 1000, while among officers and the civil population it is only 9 per 1000. In France the returns of the army of the interior show a mortality of 18 per 1000, while among the civilians it is 10 per 1000; and this is exceeded in all the colonies. In the island of Barbadoes the mortality among civilians is not more than 14 per 1000, while among European troops it is 58 per 1000.

As compared with the mortality in the navy the crews in the Mediterranean, South American, and Home Station are all greatly more healthy than any European troops, the average mortality being 9 per 1000. In the East Indian command the average is 15 per 1000, corresponding with that of the troops in Britain. In the West Indian and North American command it is 18 per 1000, being the same as among the British troops at Malta, and in the Cape of Good Hope, and West Africa command, where the mortality among the troops is 45 per 1000, or 45 per cent.; in the navy it is only 25 per 1000, or $2\frac{1}{2}$ per cent.

The effect of the means adopted for checking disease in the three great countries of England, France, and Germany, during the past century, are such, that while formerly one out of every 30 of the population died each year, now the average is one in 45—reducing by one-half the number of deaths in these countries. In the year 1700 one out of every 25 of the population died in each year in England. In 1801 the proportion was one in 35, in 1811 one in 38, and in 1848 one in 45, so that the chances of life have in England nearly doubled within 80 years. In the middle of last century the rate for Paris was one in 25, now it is one in 32.—*Proceed. Brit. Association, 5th August 1850.*

ON THE RAPID DECREASE OF THE NATIVE POPULATION OF POLYNESIA.

THE fertility of hybrid races, originating in the intermixture of two races whose affinity is most remote, is a fact of which there can be no doubt whatever; and there is strong reason to believe that these hybrid races, the parents of which are Europeans on one side,

and the aborigines of any country on the other, are generally destined to become the dominant population of those countries. For, on the one hand, these "half casts" very commonly combine the best attributes of the two races from whose admixture they sprang; namely, the intelligence and mental activity of the European, and the climatic adaptation of the native,* and they are also in general distinguished for their fertility, when paired with each other, so that they are rapidly rising into numerical importance. On the other hand, this very intermixture, taking place as it usually does between an European father and a native mother, tends to diminish the number of the native population in a very remarkable manner; for there is now a large amount of evidence, that when a native female of the American or Polynesian races has once been impregnated by an European male, she thenceforth loses all power of conception from intercourse with the male of her own race. This was first pointedly stated by that very intelligent traveller, the Count de Strzelecki, who has lived much among different races of aborigines, the natives of Canada, of the United States, of California, Mexico, the South American Republics, the Marquesas, Sandwich and Society Islands, New Zealand, and Australia, and who affirms that in *hundreds of cases* of this kind into which he has enquired, and of which he preserves memoranda, there has not been a single exception. †

As regards Australia and New Zealand, this statement, strange as it seems at first sight, has been fully borne out by independent evidence; † and it offers the most complete explanation yet given, of the very rapid decrease in the native population of the various islands of Oceania, in which European races have been long established.—*Dr. Carpenter.*

AUSTRALIAN BULIMI.

Of the *Bulimi* of Australia little is at present known. One species, *B. atomatus*, with a large dark-coloured inflated shell, has been collected at Port Macquarie; one small species, *B. trilineatus*, at Port King George; and two, *B. Kingii* and *inflatus*, of which the precise locality is unknown. Two species with thin dusky shells, *B. melo* and *Dufresnii*, inhabiting Van Diemen's Land, constitute the southern limit of the genus in the eastern hemisphere.—*Ann. and Mag. of Nat. Hist. April, 1851.*

* This is well seen in the case of the descendants of the mutineers of the *Bounty* and of Tahitian women, who now occupy Pitcairn's Island.

† [Remarkable as Count Strzelecki's observations usually are for their great accuracy, the law here so broadly enunciated is not without its exceptions; for there is now living at the Tasmanian Aborigines' establishment, at Oyster Cove, a native black woman of Tasmania, who, when young, bore black children to her native husband,—then several "half casts," of whom, two grown-up women are now alive; and, finally, two or three black children (one of whom is now a fine boy about nine years old) by a black countryman, to whom she was united upon being removed from her European protector.—*J. M.*]

‡ See the Count de Strzelecki's *Physical Description of New South Wales and Van Diemen's Land*, p. 345-347.

THYLACINUS CYNOCEPHALUS.

[*Zoological Society, May 14, 1850.*]

THE Secretary stated, through the liberality of Ronald Gunn, Esq., and Dr. Grant, of Launceston, the Menagerie had been enriched by the safe arrival of two living specimens of *Thylacinus cynocephalus*. The author states in the letter which accompanied this most valuable and interesting gift, that—

“An observation of mine, contained in a letter to Sir W. Hooker, and which was not meant for publication, has been misunderstood, and has led to the propagation of error—for which I am very sorry. In it I said the ‘Thylacine’s tail was *not compressed*—in reference to an observation of Mr. Swainson’s in the ‘*Encyclopædia of Geography*’ (then recently published), that the tail of the Thylacine was compressed, *which suggested the supposition that it was used in swimming, &c.* It was to the latter part of this observation that my remarks were particularly applied (vide *Annals of Nat. Hist.* vol. i. p. 101–2), and I meant that the tail was not compressed to such an extent as to have justified the inference that it was useful in swimming; and thus that the animal obtained its food principally from the sea, which the paragraph in the ‘*Encyclopædia of Geography*’ implied. The tail is obviously slightly compressed, but not, I think, more so than the tails of the Dasyures, to which aquatic habits are not attributed. In writing hurriedly—and not for publication—I did not express myself with the precision I ought to have done. I mainly wished to point out that the tail would not justify the inference of Mr. Swainson (which I thought very far strained), that the animal was aquatic in its habits and piscivorous.”

ON SOME BONES AND EGGS FOUND AT MADAGASCAR, IN RECENT ALLUVIA, BELONGING TO A GIGANTIC BIRD. BY M. ISIDORE GEOFFROY-SAINT-HILAIRE.*

[*Annals and Magazine of Natural History, March 1851.*]

WE received the day before yesterday from M. Malavois, a planter in the Island of Réunion,† some objects of such great interest, that we deem it a duty to submit them immediately to the attention of the Academy. They prove the existence at Madagascar, geologically recent, of a bird of gigantic size, new to science, but with regard to which there existed, as will presently be seen, some indications.

The discovery of these objects was made, in 1850, by M. Abadie,

* Translated from the *Comptes Rendus* for January 27, 1851.

† Commonly called Bourbon.—H. E. S.

captain of a merchantman. During a stay at Madagascar,* M. Abadie one day observed, in the hands of a Madagascan, a gigantic egg, which the natives had perforated at one of its extremities, and which they employed for various domestic purposes. The accounts which M. Abadie received from the Madagascans soon led to the discovery of a second egg, of nearly the same size, which was found, perfectly entire, in the bed of a torrent, amongst the debris of a land-slip which had taken place a short time previously. Not long afterwards was discovered, in alluvia of recent formation, a third egg, and some bones, no less gigantic, which were rightly considered as fossil, or rather, according to an expression now generally adopted, as subfossil. All these objects were immediately forwarded, unfortunately without the necessary precautions, from Madagascar to the Ile de la Réunion, and thence to Paris: one of the eggs arrived broken into a multitude of fragments, but it can be restored; the two others are in a perfect state of preservation.

The objects which I have the honour to place before the Academy are the two entire eggs, a piece of the shell of the broken egg, and some osseous fragments, one of which especially, as will be seen, is of great interest to science.

The two eggs which are now before the Academy differ little in size, but much in form. One of them has the two ends very unequally convex; the other represents almost exactly an ellipsoid of revolution. The following are the dimensions:—

	Ovoidal egg.	Ellipsoid egg.
	metre.	metre.
Long diameter	0·34†	0·32
Transverse diameter	0·225	0·23
Large circumference	0·85	0·84
Small circumference	0·71	0·72
Size.....	„	c. m. 0·008887

The thickness of the shell is about 3 millimetres.

We shall give comparatively the principal measures, taken or calculated in the same manner, with the Ostrich and the other large birds of the same group, and with the Hen:—

	Ostrich.	Rhea.	Casowary.	Emu.	Hen.
	m.	m.	m.	m.	m.
Large circumference	0·46	0·35	0·365	0·335	0·16
Small circumference	0·425	0·30	0·29	0·27	0·14
Size	c. m. 0·001527	c. m. 0·000735	c. m. 0·000532	c. m. 0·00526	c. m. 0·000060

The thickness of the shell, larger in proportion, is in that of the Ostrich 2 millimetres. It is 1 millimetre with the Casowary, and less with the other birds.

According to the preceding measures, it appears that the capacity

* On the south-west coast of the island, according to M. Malavois. It will be seen hereafter that another egg has been discovered at the north-west extremity of the island.

† In English measure the ovoidal egg is about 13½ inches by 8½ inches.—H. E. S.

of the egg of the large bird of Madagascar is about $8\frac{3}{4}$ litres *, and that, to represent its size, it would require nearly 6 eggs of the Ostrich, 12 of the American Ostrich or Rhea, $16\frac{1}{2}$ of the Casowary, 17 of the Emu, and 148 of the Hen. We may add, contrasting with each other the two extremes of the series, that this same bulk is equal to that of 50,000 eggs of the Humming bird.

Are the eggs which have just come to us from Madagascar those of an immense reptile or of a gigantic bird? This was the first question which suggested itself on their discovery. The examination of their shells, the structure of which is similar to that which is observed in those of the large birds with rudimentary wings, and particularly of the Emu, would have sufficed for the solution of this question; but it is given much more directly and completely by the bony fragments which have come with the eggs. One of them is the lower extremity of the large metatarsal bone of the left side: it has the three trochlear apophyses; two of them are even almost untouched. It is enough to cast a glance upon this eminently characteristic piece to recognize that it belongs to a bird. Moreover, on examining it with some attention, we soon arrive at the following conclusions. The great bird of Madagascar differs considerably from the Dodo; it wanted that greatly developed thumb, by which the large bird of the Mauritius differed from the Struthionians and the Casowarians; this we are authorized to conclude from the non-existence, at the bottom of the large metatarsal bone, of the indentation which corresponds with the insertion of the thumb in the Dodo and the other birds whose foot presents the same conformation. In this point of view, the Madagascar bird approaches the *Dinornis*; but it differs from it, as well as from the other allied genera recently discovered in New Zealand, in the very dilated and depressed form of the lower portion (and probably of the greater part) of the metatarsal bone.†

As for the *Ornithichnites*, on the one part, and the Ostrich and other allied genera, no one would assuredly be induced to assimilate them to the gigantic bird of Madagascar, which henceforth should become the type of a new genus in the group of the *Rudipens* or *Brevipens*. We shall give to this genus the name of *Æpyornis*,‡ and to our species the epithet of *maximus*.

The consideration of the other osseous fragments will confirm, we may already assert, the inductions to which we have just been led by the examination of the great metatarsal—the portion to which we have first directed our attention, as eminently proper to characterize not only the class and order, but even the genus to which the precious fragments transmitted by M. Malavois are to be referred. Such a study will doubtless enable us to discuss (that which we could not as yet do with advantage) the value of the affinities which connect the *Æpyornis* with the various genera of the

* A litre is = 61 028 English cubic inches.—H. E. S.

† Immediately above the trochlear apophyses, this bone is near 1 decimetre across, and its thickness scarcely exceeds 3 centimetres. A decimetre higher up, we find 0·07 metre again for the transversal diameter, and only 0·0375 for the antero-posterior diameter.

‡ *Alta* or *magna avis*.

same group, and to determine with some accuracy the dimensions of this ornithological giant. Meanwhile, and with a view to answer the questions which have been addressed to us from all quarters, we shall restrict ourselves, on this last point, to some remarks, intended especially to prevent the exaggerations in which some might be apt to indulge.

The long diameters, in the eggs of *Æpyornis* and Ostrich which we have compared, are, in the one case, 32 centimetres, and, in the other, 16; they are therefore to one another as :: 2 : 1. With respect to their bulk, it has been seen above that these eggs are nearly :: 6 : 1. Are we to suppose that the two birds have the same proportions as their eggs? The Ostrich being 2 metres high, the height of the *Æpyornis* would then reach 4 metres. We think that it would be erroneous to admit this proportion. If we possessed no other elements of determination than the eggs of the *Æpyornis*, we should have to recollect that, even amongst birds very nearly allied, the dimensions of the eggs are far from being exactly proportional to the size of the species which produce them: the estimate therefore which we have mentioned would for this reason alone be very doubtful. But we can go still further: we think that even at present we are warranted in reducing this estimate.* According to the comparison of the osseous parts, the *Æpyornis* must be a less slender bird and with legs proportionally shorter than the Ostrich. Possibly its size was, with relation to that of the latter bird, almost in the proportion of 6 to 1; but its body was not supported on limbs quite double the height.

The estimate of the stature of the *Æpyornis*, as founded on a comparison of that bird with other Rudipens than the Ostrich, with the Emu, for example, confirms this inference. Calculated according to the long diameters of the eggs, it would give, for the *Æpyornis*, no longer 4 metres, but only about 3·8 metres, the Emu being 1·50 metre high, and its egg 0·125 metre long. From the comparison of the terminal portion of the metatarsal in the Emu, and the corresponding part in the *Æpyornis*, the one measuring 5 centimetres and the other 12 centimetres, we should deduce a result which agrees very well with the preceding: the height of the *Æpyornis* would be about 3·6 metres.

We thus arrive, in various ways, at this conclusion, that the stature of the *Æpyornis* would be comprised between 3 and 4 metres, and consequently greater than that of the *Dinornis giganteus* itself; since the stature attributed to this last by Prof. Owen † is a little less than 3 metres. We must remark, that the comparison of the extremity of the metatarsal of our *Æpyornis* with the same part in the *Dinornis* gives, in fact, a difference of dimension in favour of the first; but this difference is very slight, and might be explained

* And it would even be reduced, by a comparison of the eggs, made, not according to the long diameters, but after the transverse, or from the circumferences. The egg of the *Æpyornis* is proportionally a little more elongated and less arched than that of the Ostrich.

† On *Dinornis*, in the "Transact. of the Zool. Society of London." The last of the plates of this remarkable memoir (pl. 30). *Scale of altitude*, gives the *Dinornis giganteus* a height of 9½ feet (English), that is to say, 2·9 metres. This estimate is, however, lower than that which other authors admit.

as well by the diversities of proportion as by an inequality of height.

Can so gigantic a species, which has lived without doubt in times not far remote from our own, and of which it cannot even be asserted that it has entirely disappeared from the surface of the globe,* have remained so long, to the present day, without anything having revealed its existence to the naturalists of Europe? We could not postpone, until the appearance of the memoir which we intend to publish on the *Æpyornis*, adverting to some indications relative to this bird which science already possesses.

Shall we place Flacourt amongst the number of the authors who have known, at least by hearsay, the gigantic bird of Madagascar? Is it the *Æpyornis* which that celebrated traveller mentioned, two centuries ago, under the name of *Vouron-Patra*? "It is," he says, † "a large bird which haunts the Ampatres, and lays eggs like an Ostrich; it is a species of Ostrich. Those of the said places are not able to take it: it seeks the most desert places." It is hardly necessary to add, that a passage so vague may quite as well, and better, apply to a bird of a high stature, but nevertheless lower than that of the Ostrich, as to a species so gigantic as the *Æpyornis*.

If Flacourt did not know the *Æpyornis*, there is at all events another French traveller who unquestionably heard speak of it, and who even saw one of its eggs, very similar to those which we have described above. In one of the additions which Mr. Strickland has recently made ‡ to his remarkable work on the Dodo.§ is found a document formerly considered as fabulous, but whose scientific interest is now placed beyond a doubt. Under the title "Supposed existence of a gigantic bird at Madagascar," Mr. Strickland has given a curious relation, made in 1848, by a French merchant, M. Dumarele, to M. Joliffe, Surgeon of the *Geyser*, and which the latter extracted from his private journal; M. Dumarele stated that at Port-Leven, on the north-west end of the Isle of Madagascar, he saw a gigantic egg, the shell of which was as thick as a Spanish dollar, and which held "the almost incredible quantity of thirteen wine quart bottles of fluid." M. Dumarele offered to purchase the egg and send it to Europe; but the natives declined selling it, as it belonged to their chief, and on account of its extreme rarity. Thus M. Dumarele was unable to produce any proof in support of his statement, and, without casting any suspicion on his veracity, it was thought that he might have been imposed upon by the natives.

According to these natives, who were of the race of Sakalavas, the gigantic bird of Madagascar still existed, but was extremely rare. In other parts of the island, on the contrary, its present existence is not credited; but at least a very ancient tradition is met with relative to a bird, of colossal size, which threw down an ox and devoured it; it is to this bird that the Madagascans attribute

* The *Notornis*, at first known by subfossil debris, and regarded as an extinct species, has lately been found alive in New Zealand. See Ann. Nat. Hist. for November 1850, p. 398.

† *Histoire de la grande Ile de Madagascar*, edit. of 1758, p. 165.

‡ *The Annals and Mag. of Nat. Hist.* No. 23 (November 1849), p. 338.

§ *The Dodo and its Kindred*, London, 1848.

the gigantic eggs which are occasionally found in their island. We take this statement from an interesting letter, in which M. Lépervanche Mézière, a well-informed naturalist of the Isle of Réunion, kindly informed the Museum of Natural History of the discovery of the eggs of *Æpyornis*, immediately on its having been made.*

It is scarcely necessary to add, that the tradition which we have just mentioned would attribute to the *Æpyornis* habits which are far from having belonged to it: it is a fable quite similar to that which exists in New Zealand on the subject of the Moa, and which has no more serious foundation. The *Æpyornis*, like the *Dinornis*, was a Rudipen, and that species, of which popular belief has made a gigantic and terrible bird of prey, like to the *Roc* or *Ruc* of the Eastern tales,† had neither talons, nor wings adapted for flying, and must have fed peaceably on vegetable substances.

DESCRIPTIONS OF SOME NEW GENERA AND SPECIES OF SPATANGIDÆ
IN THE BRITISH MUSEUM. BY J. E. GRAY, ESQ., F.R.S., P.B.S.,
&c.

[*Ann. and Mag. of Nat. Hist.*, February 1851.]

THE following genera and species do not appear to be included in M. Agassiz and Desor's "Catalogue Raisonné." They will be figured in the Catalogue of the *Echinidæ* in the British Museum.

Spatangus Reginae. Purple? subcordate; back convex, larger dorsal tubercles few and far apart, scattered, ambulacral petals broad.

Hab. Malta.

This species is very like *S. purpureus*, but the back is higher, more convex, and there are not half the number of dorsal tubercles found in that species. It was collected by Miss Emilie Attersoll,

* This new letter informs us, positively, that one of the eggs at least comes from the same bed as the osseous fragments.

† The fables respecting the Roc may not indeed be unconnected with these discoveries of gigantic eggs, made no doubt from time to time in the island of Madagascar, and with the belief to which they have given rise among the natives. But it would be going too far to make of the Roc, with Mr. Strickland, a Madagascan bird, which we might then be induced to refer completely to the *Æpyornis*. Mr. Strickland has misunderstood Marco Polo, the only authority whom he has here cited. Marco Polo, in his celebrated account (book iii. chap. 40), speaks of the Roc immediately after having treated of Madagascar, but not as belonging to that island. Quite the contrary, he makes it an inhabitant of *quelques autres isles outre Madagascar sur la coste du Midy*, French edit. of 1556, p. 115; *aliarum insularum ultra Madagascarem* (Latin edit. of 1671, p. 157).

[I can only say that in Marsden's edition of Marco Polo (4to. London, 1818, p. 707), I read as follows:—"The people of the island (viz. Madagascar) report that at a certain season of the year, an extraordinary kind of bird, which they call a *ruk*, makes its appearance from the southern region;" &c. Polo states that the "other numerous islands lying further south" were unfrequented by ships, and his account of the Roc unquestionably refers to Madagascar.—H. E. STRICKLAND.]

who formed part of the suite of H. M. Queen Adelaide during her visit to Malta.

Eupatagus similis. Ovate, depressed, with only two or three rather larger tubercles near the peripetalous fasciole.

Hab. Australia, Flinder's Island.

This species differs from *E. Valenciennesii* of Agassiz, t. 15. f. 3, in not having nearly so many tubercles on the back. Several specimens of it were sent to the Museum by Joseph Milligan, Esq.

Lovenia elongata. *Spatangus elongatus*, Gray, in Eyre's Discov. Central Australia, i. 436, t. 6. f. 2. Ovate, rather elongate, depressed; back with many sunken tubercles on the sides.

Hab. Port Essington, Mr. Jukes.

Lovenia subcarinata. Shell elongate, narrow, the lower anterior edge keeled, the lower part of the upper side with six or eight large tubercles placed in two series on each side at the end of the anterior lateral ambulacra.

Hab. Philippines, Isle of Luzon, H. Cuming, Esq.

ECHINOCARDIUM. This genus may be divided into the following sections:—

* *Anterior odd ambulacral groove deep, hinder end perpendicular, lower part blunt.*

Echinocardium cordatum, &c. To this section also belong—

Echinocardium australe. Very like *E. cordatum*, but the hinder end is erect and the lower edge rather acute.

Hab. Australia, Port Jackson, J. B. Jukes, Esq.; Van Diemen's Land, Ronald Gunn, Esq., and Dr. A. Sinclair.

Echinocardium zealandicum. Very like the former, but plastron lanceolate elongate, and the body more ovate and elongate.

Hab. New Zealand, Dr. Andrew Sinclair: several specimens.

** *Anterior odd ambulacral groove shallow, lower part of hinder end produced, acute.* *E. gibbosum*.

Breyntia Australasiae. *Spatangus Australasiae*, Leach, Zool. Misc. ii. t. 82., 1825. *S. Crux Andree*, Lamk. Hist.; Agassiz, Ann. Sci. Nat. vi. t. 16. f. 14. Large tubercles on sides of lateral ambulacra few, internal fasciole short, broad.

Hab. Port Jackson.

Dr. Leach's specimen exactly agrees with M. Agassiz' figure.

Breyntia Desorii. Sunken tubercles on the lateral and posterior interambulacral area numerous (about thirty), the internal fasciole elongate, narrow.

Hab. Swan River.

Several specimens, all differing in the above characters from the former.

MEOMA. Shell subcordate, vertex subcentral; ambulacra sunken, lateral pairs equal, odd anterior one entirely obliterated, marked by a shallow groove, surrounded by a very sinuous peripetalous fasciole, without any lateral fasciole; subanal fasciole incomplete, edging the under side of the indistinct subanal disk, and only extending up to the level of the lower edge of the vent and with the subanal pores in the fasciole.

This genus differs from *Brissus* in the incompleteness of the subanal fasciole, the indistinctness of the subanal disk, and in the entire absence of the anterior ambulacral pores. It differs from

Faorina in wanting the lateral fasciole. Dorsal tubercles small, equal.

Meoma grandis. Subcordate, rather convex.

Hab. Australia, Capt. Sir Edward Belcher, K.C.B., R.N.

FAORINA. Shell ovate, subcordate, ventricose; vertex central, hinder end truncated, without any distinct subanal disk; ambulacra sunken, the lateral ones regularly diverging, anterior longest, anterior odd one obliterated, marked by a deep groove, all surrounded by a rather sinuous peripetalous fasciole without any lateral or subanal fasciole or anal plate; ovarian pores two, three, or four.

Faorina chinensis. Purple, with a smooth band between the upper anterior tesseræ, and a smooth vertical band over the suture from the end of the anterior lateral ambulacra to the front of the mouth.

Hab. China, J. R. Reeve, Esq.

Faorina antarctica. Subcordate, rather depressed; lateral ambulacra ovate, longitudinal, very deep, forming a very distinct rib on the inner side of the shell; peripetalous fasciole broad, sinuous.

Hab. South Polar Seas, Capt. Sir James Ross's expedition.

This species differs from *Faorina cavernosa* (Erichson, Arch. 1845, t. II. f. 2) in the ambulacra being less broad, and in the fasciole being much broader and more distinct.

Tripylus Philippii. Cordate, rather depressed; lateral ambulacra oblong, linear, the hinder pair not half the length of the anterior one, the sides of the hinder part of the peripetalous fasciole parallel.

Hab. —.

The genus *Tripylus* of Philippi differs from *Desoria* and *Schizaster* in the regular cordate form and central vertex, and differs from *Brissiopsis*, with which M. Agassiz confounded it, in the absence of the subanal fasciole.

DESORIA. Shell ovate, convex, vertex subanterior; ambulacra narrow, sunken, like *Brissus*, the anterior odd one formed of a series of small double pores, all surrounded by a very sinuous peripetalous fasciole giving off a lateral fasciole, which extends to the vent without any distinct subanal fasciole or subanal disk.

Very like *Brissus*, but distinguished by the presence of the lateral fasciole and the absence of the subanal one and disk.

Desoria Australis. Ovate, purplish white.

Var. 1. Brown, each of the tesseræ with a broad pale edge.

Hab. Australia, Flinder's Island, Joseph Milligan, Esq. Several specimens.

Schizaster ventricosus. Very like *S. canaliferus*, but the hinder part of the body is very high, the hinder end nearly vertical, ventricose, and regularly rounded above the vent, the hinder part of the peripetalous fasciole straight between the two lateral ambulacra.

Hab. Australia ??

Schizaster Jukesii. Like former, but vertex nearly central; crown strongly keeled between the two hinder ambulacra; the part of the peripetalous fasciole between the anterior and posterior ambulacra regularly bent up nearly to the vertex, the hinder end vertical, regularly rounded above the vent.

Hab. North Australia, J. B. Jukes, Esq.

KLEINIA. Shell ovate, elongate, ventricose, subcordate, vertex subcentral; centre of back with rather larger perforated tubercles; lateral ambulacra sunken, ovate, linear, confluent near the vertex, where the inner series of twin pores are nearly obliterated, the anterior pair diverging, the hinder pair nearly parallel, diverging at the end, the anterior odd one in a rather deep groove with only rudimentary pores; all surrounded by a broad, rather sinuous peripetalous fasciole; subanal fasciole surrounding the oblong subanal plate, which is covered with radiating series of tubercles, and transversely divided in half by a subcentral fasciole; ovarial pores four, hinder largest; mouth anterior, vent in the upper part of the high hinder extremity covered with small irregular plates; spines of the crown elongate subulate, of the plastron and subanal plate longer, stronger, rather dilated at the end.

This genus differs from *Brissus* in the peculiar form of the ambulacra, and in the larger size of the dorsal spines and tubercles, and from *Plagionotus* in the form of the subanal plate and ambulacra.

Kleinia Luzonica. Shell ovate, ventricose; ambulacra confluent near the vertex, inner series of pores nearly obliterated; lateral ambulacra ovate, petaloid, the hinder pair shorter, nearly parallel, anterior pair divergent; vent in the upper part of the high hinder extremity.

Hab. Philippines, Isle of Luzon.

Agassizia subrotunda. Ovate, subglobose, regular, even, without any tubercles on the side or round the vent, the odd anterior groove with two lines of minute tubercles.

Hab. Australia, Capt. Sir Edward Belcher.

LESKIA. Shell ovate, subglobose, thin, vertex central; lateral ambulacra broad, petaloid, rather sunken and separate from each other, the hinder lateral pair rather the shortest, the odd anterior ambulacra in a rather broad sunken groove, rudimentary, with only a single series of pores on each side; all surrounded by a broad rather sinuous peripetalous fasciole; lateral and subanal fasciole none; mouth anterior, round, on a level with the rounded under surface, and covered with five triangular converging valves; plastron and subanal plate not distinctly defined; anus round, in the upper part of the rounded posterior end, and covered with five triangular converging valves forming a cone, with some small spicula in the centre; ovarian pores two, very large; spines and tubercles subequal, subulate, those of the back being rather the largest.

This genus agrees with *Brissus* in the form of the peripetalous fasciole, but differs from it and all the other *Spatangidae* in the form of the mouth and vent.

1. *Leskia mirabilis.* Shell ovate, subglobose.

Hab. Isle of Luzon.

A NOTE ON THE BOKHARA CLOVER. BY WILLIAM TAYLOR, ESQ.,
F.L.S.

[*Proc. Lin. Society, November 1840.*]

MR. TAYLOR obtained from Mr. Loudon a small parcel of the Bokhara Clover (*Melilotus arborea*), which was sown early in April, 1839. The plant proved to be biennial, and stood the winter well. On the 28th of April following, a part of the crop was cut down, the stems measuring 15 inches in height; and on the 28th of May, from the same piece of ground, a second crop was obtained, which had reached the height of 16 inches; a third on the 28th of June, 17 inches; a fourth in July, 16 inches; a fifth in August, 15 inches; and a sixth in September, measuring 14 inches. According to Mr. Taylor's calculation, the Bokhara Clover would yield from 20 to 30 tons of green herbage per acre, and from 2 to 3 tons of strong fibre, which appears capable of being manufactured into cordage.

The flowers are white and very fragrant, and the plant does not appear to differ specifically from the *Melilotus leucantha*, although regarded by De Candolle as a distinct species.

ON NEW SPECIES OF MAMMALIA AND BIRDS FROM AUSTRALIA.

BY J. GOULD, F.R.S., F.Z.S., ETC.

[*Proc. Zool. Soc. Lond., November 1849.*]

THE Proceedings of the Zoological Society having been the means by which the many interesting novelties in Natural History obtained during the surveying voyages of Captains King, Beechey, Belcher, Fitzroy, Blackwood, &c., by the naturalists attached to their several ships, have been made known to the scientific world, a more appropriate channel cannot, I presume, be selected for communicating the interesting results, so far as known, of the expedition now exploring the coasts of Northern and Eastern Australia, under the command of Capt. Owen Stanley; and I therefore hasten to lay before the Society such novelties as have been received in the two branches of natural history to which I have devoted myself, viz., Mammalia and Birds.

The collection recently sent home by Capt. Stanley and Mr. MacGillivray, the able naturalist of H.M.S. "Rattlesnake," is a very fine one: it has been procured on what may be considered hitherto untrodden ground; I cannot therefore do better than give a list of the whole,—such lists, showing the geographical distribution of species, being in the highest degree valuable. I have said that the collection is a very fine one, and I must not omit observing that much credit is due to Capt. Stanley for affording the naturalist the requisite opportunities for obtaining so many interesting species; nor is a lesser meed of praise due to Mr. MacGillivray, for the very excellent manner in which the specimens are prepared, and the

accuracy with which all the information connected with them that could be obtained has been noted down. The collection of Quadrupeds and Birds only has been placed in my hands for examination, with a view to my publishing such novelties as it may contain in my works on these subjects; after which the specimens are to be sent to the British Museum. The period that has elapsed since the arrival of the collection has been far too short to admit of my investigating the subject as I could wish; I shall therefore, on the present occasion, exhibit some of the species that appear to me to be new, and defer my remarks upon the entire collection to the next or some future meeting of the Society.

I shall now proceed to describe two species of mammalia and two species of birds from this collection, as follows:—

PTEROPUS CONSPICILLATUS, Gould.

Sp. Ch.—Crown of the head black, slightly grizzled with buff; round each eye a large oval patch of deep brownish buff, which advances on the sides of the face and shows very conspicuously; at the nape a broad crescent-shaped band of deep sandy buff, which extends down the sides of the neck and nearly meets on the breast; centre of the back glossy black, slightly grizzled with grey; cheeks, chin, all the under surface and rump, black, slightly grizzled with buff; ears and wing-membranes naked and of a deep purplish black; claws black.

Hab. Fitzroy Island.

This species is about the size of *Pteropus poliocephalus*, but has a somewhat larger head and much larger and more powerful teeth, and is moreover rendered conspicuously different from that species by the nuchal band being of a deep sandy buff instead of deep-rust red, and not continuous round the neck; by the crown of the head and back being almost jet-black; and the eyes being conspicuously encircled with deep buff (whence the specific name); in which latter character it assimilates to *P. funereus*, but scarcely to any other. Respecting this species Mr. MacGillivray writes: "Is this not new to Australia? It is not *funereus*, of which see skull No. 7 and skin No. 8, nor is it *poliocephalus*. Of its habits I extract the following note from my journal: "On the wooden slope of a hill on Fitzroy Island I one day fell in with this bat in prodigious numbers, looking while flying along the bright sunshine (so unusual for a nocturnal animal) like a large flock of rooks: on close approach a strong musky odour became apparent, and a loud incessant chattering was heard; many of the branches were bending under their load of bats, some in a state of inactivity suspended by their hind claws, others scrambling along among the boughs and taking to wing when disturbed. In a very short time I procured as many specimens as I wished, three and four at a shot, for they hung in clusters, but unless killed outright they remained suspended for some time: when wounded they are handled with difficulty, as they bite severely, and on such occasions their cry reminds one of the squalling of a child.'"

PHALANGISTA (PSEUDOCHEIRUS) NUDICAUDATA, Gould.

Sp. Ch.—Head, all the upper surface, the sides of the body, and the outer sides of the limbs, brownish gray; the tips of the hairs with a silky appearance; under surface of the neck and body and

the inner sides of the limbs pale buff; the colouring of the upper and under surface distinctly defined on the sides of the body, but gradually blending on the limbs, the rump and root of the tail, which is thickly clothed on its basal third and naked for the remainder of its length; hands, feet, and naked portion of the tail pinky flesh-colour.

	inches.
Length from tip of nose to root of tail	12
——— of tail	8
——— of fore-feet, including the nails	3
——— of hind-feet, including the nails	3½

Hab. Cape York, the most northern point of Australia.

This species differs from all the other Australian members of the genus, in having the apical three-fourths of its tail entirely destitute of hair; in the light-coloured mark on the rump, somewhat resembling that on the same part of the Koala; and in its short dense fur and short ears.

The above description and admeasurements are taken from a female said to be about two-thirds grown. The ears are exceedingly short and rounded, and the fur is remarkable for its extreme density and for its resemblance to that of the Koala.

PTILORIS VICTORIÆ, Gould. (Aves, Pl. XII).

Sp. Ch.—Male: general plumage rich deep velvety black, glossed on the upper surface, sides of the neck, chin and breast with plum-colour; feathers of the head and throat small, scale-like, and of a shining, metallic bronzy green; feathers of the abdomen very much developed, of the same hue as the upper surface, but each feather so broadly margined with rich deep olive-green, that the colouring of the basal portion of the feather is hidden, and the olive-green forms a broad abdominal band, which is sharply defined above, but irregular below; two centre tail-feathers rich shining metallic green, the remainder deep black; bill and feet black.

Female: all the upper surface grayish brown, tinged with olive; head and sides of the neck dark brown, striated with grayish brown; over each eye a superciliary stripe of buff; wing-feathers edged with ferruginous; chin and throat pale buff; remainder of the under surface, under wing-coverts, and the base of the inner webs of the quills rich deep reddish buff, each feather with an irregular spot of brown near the tip, dilated on the flanks into the form of irregular bars; bill and feet black.

Total length, 10½ inches; bill, 1¾; wing, 5; tail, 3¼; tarsi, 1¼.

Hab. Barnard's Isles.

Remark.—This new species must be placed in the first rank of the many beautiful birds inhabiting Australia: indeed, there are few from any part of the world that can vie with it in the richness of its colouring; and I cannot possibly have a better opportunity than now presents itself of paying a just tribute of respect to our most gracious Queen, by bestowing upon this lovely denizen of the Australian forests the specific appellation of *Victoriæ*;—I say of the Australian forests, for although the specimen from which my description is taken is from the Barnard Isles, within the Barrier Reef, and only a few miles from the north-eastern shore of Australia, I have evidence, in the notes of the late Mr. Gilbert, that it inhabits

the mainland, since he states therein that the Rifle-bird inhabits the northern as well as the southern part of Australia; in which he was in error: the bird he saw in the northern part of the country being doubtless the one here described.

It is very nearly allied to the *Ptiloris paradiseus*, but is a smaller bird, with a still more gorgeous colouring. It may be distinguished from that species by the purple of the breast presenting the appearance of a broad pectoral band, bounded above by the scale-like feathers of the throat, and below by the abdominal band of deep oil-green, and also by the broad and lengthened flank-feathers, which show very conspicuously.

SPHECOTHERES FLAVIVENTRIS, Gould.

Sp. Ch.—Male: crown of the head and cheeks glossy black; orbits, and a narrow space leading to the nostrils naked, and of a light buffy yellow, or flesh-colour; all the upper surface, wing-coverts, outer webs of the secondaries, and a patch on either side of the chest, olive-green; chin, chest, abdomen and flanks beautiful yellow; vent and under tail-coverts white; primaries and inner webs of secondaries black, edged with gray; tail black, the external web and the apical half of the internal web of the outer feather on each side white; the apical half of the second feather on each side white; the next, or third, on each side with a large spot of white at the tip; bill black; feet flesh-colour.

Female: striated on the head with brown and whitish; all the upper surface olive-brown; all the wing-feathers narrowly edged with greenish grey; under surface white, with a conspicuous stripe of brown down the centre of each feather; vent and under tail-coverts white, without striæ.

Total length, $10\frac{1}{2}$ inches; bill, $1\frac{1}{8}$; wing, $5\frac{3}{4}$; tail, $4\frac{1}{4}$; tarsi, $\frac{7}{8}$.

Hab. Cape York.

Remark.—Of the same size as *Sphcotheres Australis*, but may be distinguished from that and every other species of the genus by the beautiful jonquil-yellow of its under surface.

ON THE HABITAT OF *CYPRÆA UMBILICATA*, SOWERBY. BY RONALD GUNN, ESQ. IN A LETTER TO J. E. GRAY, ESQ.

[*Proc. Zool. Soc. Lond.*, 13th November, 1849.]

MR. GUNN, the enthusiastic and intelligent naturalist in Launceston, Van Diemen's Land, from whom we have received so many productions of that island, has most kindly sent to the British Museum a fine specimen of the above shell, which was described by Mr. Sowerby in the Appendix to the Tankerville Catalogue. Mr. Gunn in his letter observes:—

“Cowries, found upon the east shore of Barren Island, one of Hunter's Islands, N.W. of Van Diemen's Land. Considerable numbers of the dead shell of this species were to be seen lying upon a deep bed of the dead shells of a species of *Pectunculus*.”

“I will send you a Cowry which is new: it is most closely allied to *Cypræa eximia* of Strzelecki, ‘Physical Description of New South

Wales and Van Diemen's Land;' at all events it is not figured in Reeve's monograph of the genus. It is larger than *C. eximia*. I am not perfectly clear that it will prove to be the same; if so, it will corroborate an opinion which I have some time held, that the *C. eximia* was not a fossil, but carried inland by the aborigines, and fell from near the surface to the position in which it was said to be found.— *Vide* pp. 296, 297."

ON *CYPRÆA UMBILICATA* AND *C. EXIMIA* OF SOWERBY. BY
J. E. GRAY, ESQ.

[*Proc. Zool. Soc. Lond.*, 13th November, 1849.]

Cypræa umbilicata was described from a single specimen which was formerly in the Tankerville Collection, and is now in the British Museum. From its external resemblance to some specimens of *Cypræa Pantherina*, some peculiarities in its formation, and especially from certain apparent irregularities in its teeth, it has been thought that it might be a monstrosity, or irregular growth of that species.

The discovery of the habitat by Mr. Gunn, who has kindly sent two specimens of the species to Europe, has removed this impression, and shown that it is a distinct species; and that what was regarded as the irregularities in the plaits of the front of the pillar, is in fact the normal form of the species.

Such being the case shows that the species should be removed from the genus *Cypræa*, as restricted in my monograph in the Zoological Journal, and placed in the genus *Cyprovula*, first described in that work.

The shell, instead of having the single large plait in front of the inner lip separated from other plaits by a wide space, has the front of the inner lip covered with several oblique plaits, nearly up to the front edge of the notch.

It also agrees with *Cyprovula* in the spire being concave or sunken, forming a deep umbilicus.

Cypræa eximia, figured in Strzelecki's 'New South Wales and Van Diemen's Land,' is a very nearly allied species, and equally a *Cyprovula (eximia)*. It differs in the body being more globular and the canal longer. Both these species are to be distinguished from the other *Cyprovulæ* by the canal at each end of the mouths being more developed and produced: they also both have a somewhat angular depression across the upper part of the anterior canal, at the anterior extremity of the dorsal line, evidently formed by the junction of the two expansions of the mantle in this part.

The elongation of the canals, and the depression above referred to, are more developed in *Cyprovula eximia* than in *Cyprovula umbilicata*. They are, especially the latter, the giants of the genus. The original specimen of *C. eximia* is in the cabinet of Mr. John Morris of Kensington.

To give some idea of the extraordinary price which is now some-

times required for shells, I may state that the second specimen of this Cowry, sent home by Mr. Gunn to a London collector, was offered by him to Miss Saul for £30, and eventually realized that price.

DESCRIPTION OF A NEW SPECIES OF GORGONIA FROM AUSTRALIA.
By J. E. GRAY, ESQ., F.R.S.

[*Proc. Zool. Soc. Lond.*, 13th November, 1849.]

PRIMNOA AUSTRALASIÆ. (Radiata, Pl. II. f. 8. 9, nat. size).

Coral elongate, unbranched, rather tapering; cells numerous, regular, placed in close regular circles round the stem, each formed of two series of imbricate calcareous scales.

Inhab. Australasian seas, on oyster-shell and stones.

Several specimens of this very interesting coral were sent to the British Museum by the Royal Society of Van Diemen's Land.

This coral is often covered with various species of smaller *Coralines* and *Algæ*. It varies from two to three feet in height. The axis is known from the unbranched species of *Gorgonia* by being more calcareous, and of a pale greyish colour.

Joseph Milligan, Esq., F.L.S., the Secretary of the Royal Society of Van Diemen's Land, has kindly sent me the following particulars of this coral:—

“It was fished up from a depth of some fathoms in D'Entrecasteaux Channel, between the mainland of Tasmania and Bruné Island. It is found, as you will see, affixed to rocks and stones, and to dead, broken, and half-decayed oyster and scallop-shells, &c. It usually exists in groups, groves or families, varying from three to four to a great many. The long delicate stem, which is horny-looking and highly elastic when dry, varies from the thickness of a knitting-wire to that of a crow-quill, and from its mineralized and root-like attachment, tapers gradually and gracefully to a beautiful acicular point, attaining not unfrequently a length of two or three feet, and having its entire surface covered with a calcareous coat of a cream-yellow colour, delicately annulated, so as much to resemble the fine string of wooden beads worn as a necklace by the poorer natives of Bengal, but with this difference,—that in the coralline the beads form a connected or rather continuous chain, independently of the delicate elastic centre upon which the mineral structure is deposited. I am informed that in one or two instances, when these corallines were procured, they were enveloped throughout with a mucilaginous or jelly-like substance, which when they become dry is exsiccated and shrivelled to such a degree as to be scarcely if at all traceable. You will be able to say whether you consider it likely that there exists, in the recent and living state of the zoophyte, such an external and soft organization.”

This jelly-like substance was doubtless the polypes.

MONOGRAPH OF THE RECENT SPECIES OF TRIGONIA, INCLUDING THE DESCRIPTION OF A NEW SPECIES FROM THE COLLECTION OF H. CUMING, ESQ. BY ARTHUR ADAMS, R.N., F.L.S. ETC.

(Mollusca, Pl. III.)

TRIGONIA, Bruguière.

Testa æquivalvis, inæquilateralis, transversa, trigona, interdum suborbicularis; dentes cardinales oblongi, lateraliter compressi, divaricati; duo in valvâ alterâ, utroque latere transversim sulcati; quatuor in alterâ, uno tantum latere sulcati; ligamentum externum, crassum, marginale; impressiones musculares duæ.

Shell equi- or inequilateral, mostly inequilateral, transverse, rather triangular, sometimes suborbicular; cardinal teeth oblong, laterally compressed, divaricated, two in one valve transversely grooved on both sides, four in the other grooved on one side only; ligament external, thick, rather short, marginal; muscular impressions, two, distinct, lateral; pallial impression very nearly entire.

TRIGONIA MARGARITACEA, Lamarck. *T. testâ suborbiculatâ, radiatim costatâ, intus margaritaceâ, costis elevatis, verrucosis, subasperis; margine plicato.*

Shell rather compressed, with 20 or 23 rather narrow, nodulose, radiating ribs; the hinder ribs very compressed, all excepting the front ribs wide apart.

Hab. Van Diemen's Land; Ronald Gunn, Esq. (Mus. Cum.)

Trigonia margaritacea, Lamarck, *Ann. du Mus.* tom. iv. p. 355. pl. 67, fig. 2.

T. pectinata, Lamk.

TRIGONIA LAMARCKII, Gray. *T. testâ subventricosâ, solidâ, costis 20—26 angustatis planiusculis nodulosis radiantibus, costis aræ posticæ confertis angustatis, costis omnibus confertis nodulosis.*

Hab. in Novâ Hollandiâ.

Shell rather ventricose, solid, with 20 to 26 narrow, flat-topped, nodulose radiating ribs; the ribs of the hinder slope narrow, rather crowded; ribs convex, all close together and nodulose.

Hab. New Holland, Port Jackson; Mr. Stutchbury. (Mus. Cum.)

Varies, with the inside white, salmon-coloured, yellow, or purple bronze.

Trigonia Lamarckii, Gray, *Annals of Nat. Hist.* 1838, p. 482.

TRIGONIA JUKESII, A. Adams, n. sp. *T. testâ ovato-trigona, posticè truncatâ, margine sinuato, radiatim costatâ, costis circa 20—24 elevatis, tuberculato-nodosis, tuberculis rotundatis, obtusis, margine ventrali valdè pectinato.*

(Mollusca, Pl. III. figs. 4, 5, 6.)

Shell ovately trigonal, posteriorly truncated, the margin sinuated,

radiately ribbed ; ribs about 20—24, elevated, tubercularly nodose ; tubercles rounded, obtuse, ventral margin strongly pectinated.

Hab. Cape York, 6 fathoms ; *J. Jukes Esq.* (Mus. Cuming.)

MEMOIR ON GIGANTIC WINGLESS BIRDS OF NEW ZEALAND. BY
PROFESSOR OWEN.

[*Proc. Zool. Soc. Lond., February 1850.*]

PROFESSOR OWEN communicated a Memoir,* in continuation of his previous papers published in the Transactions (vol. iii. pp. 243, 307, 345), on the Gigantic Wingless Birds of New Zealand.

Having in the previous Memoirs determined and referred to their genera and species the different bones of the leg, he made those of the foot the subject of the present communication, which was illustrated by the exhibition of an extensive series of remains from both the North and South (or Middle) islands of New Zealand ; comprising the entire series of phalanges of one and the same foot of the *Palapteryx robustus*, a gigantic species from Waikawaite ; a similarly complete series of the *Dinornis rheides* ; and series more or less incomplete of the phalanges of the *Dinornis giganteus*, *Palapteryx ingens*, and other genera and species of the singular extinct wingless birds of New Zealand. The characteristics of the different phalanges were minutely detailed, and the different proportions of the toes characteristic of different species, especially of the two most gigantic, viz., the *Dinornis giganteus* of the North island, and the *Palapteryx robustus* of the turbary deposits of the Middle island. The adaptation of the claw-bones for scratching up the soil was obvious from their shape and strength. The generic distinction of *Palapteryx* had previously been indicated by a slight depression on the metatarsus, supposed by the author to be for the articulation of a small back-toe, as in the *Apteryx* ; and he had since received a specimen of the principal bone of that toe, which was exhibited and described. A nearly entire sternum, a portion of a minute humerus, and a cranium of one of the smaller species of *Dinornis*, were also exhibited and described.

This magnificent series of remains of great New Zealand birds had been collected chiefly by the late Colonel Wakefield, and had been transmitted to the author through the kind interest of J. R. Gowen, Esq., a Director of the New Zealand Company.

* This paper will be printed in the Transactions, vol. iv. part 1.