

glaciers once existed in the British Islands, but that large sheets (nappes) of ice covered all the surface, and that the former were the remnants of the latter.

The author then details the proofs that glaciers did not descend from the mountain summits into the plains, but are the remaining portions of the sheets of ice which at one time covered the flat country. It is evident, he says, if the glaciers descended from high mountains, and extended forward into the plains, the largest moraines ought to be the most distant, and to be formed of the most rounded masses; whereas the actual condition of the detrital accumulations is the reverse, the distant materials being widely spread, and true moraines being found only in valleys connected with great chains of lofty mountains.

It must then be admitted, the author argues, that great sheets of ice, resembling those now existing in Greenland, once covered all the countries in which unstratified gravel is found; that this gravel was in general produced by the trituration of the sheets of ice upon the subjacent surface; that moraines, as before stated, are the effects of the retreat of glaciers; that the angular blocks found on the surface of the rounded materials were left in their present position at the melting of the ice; and that, as the advance and disappearance of great bodies of ice produce debacles and considerable currents, so it may be inferred, that by such operations in times past masses of ice were set afloat, and conveyed in diverging directions the blocks with which they were charged. He believes that the Norwegian blocks found on the coast of England have been correctly assigned by Mr. Lyell to a similar origin.

Another class of phenomena connected with glaciers, is the forming of lakes by the extension of lateral moraines into a main valley; and M. Agassiz is of opinion, that the parallel roads of Glen Roy are the effects of a lake which was produced in consequence of a glacier projecting across the glen near Bridge Roy, and another across the valley of Glen Speane. Lakes thus formed naturally give rise to stratified deposits and parallel roads, or beds of detritus at different levels.

The connexion of stratified very recent deposits with glacier-detritus, M. Agassiz observes, is difficult to explain; but he conceives that the same causes which can bar up valleys and form lakes, like those of Brientz, Thun and Zurich, may have formed analogous bars at the point of contact of glaciers with the sea sufficiently extensive to have produced large salt-marshes to be inhabited by animals, the remains of which are found in the clays superimposed on the till of Scotland; and he adds, that the known arctic character of these fossils ought to have great weight with those who study the vast subject of glaciers.

In conclusion, the author remarks, that the question of glaciers forms part of many of the great problems of geology; that it accounts for the disappearance of the great mammals inclosed in the polar ice, as well as for the disappearance of the organic beings of the so-called diluvian epoch; that in Switzerland it is associated with the

elevation of the Alps, and the dispersion of the erratic blocks; and that it is so intimately mixed up with the subject of a general diminution of the terrestrial heat, that a more profound acquaintance with the facts noticed in this paper will probably modify the opinion entertained respecting it.

ZOOLOGICAL SOCIETY.

March 10, 1840.—Professor Owen in the Chair.

A paper by G. Gulliver, Esq., entitled 'Notes on the Ova of the *Distoma hepaticum*, and on certain Corpuscles obtained from the genera *Cysticercus*, was read.

The physiology of the Common Liver-Fluke is extremely interesting, on account of the connection which this parasite has with a very frequent and fatal disease of that useful animal the sheep.

"If we obtain," says Mr. Gulliver, "from the bile-ducts of the sheep some of the larger ova of the entozoon, and subject them to careful examination, it will be found that the cyst of the ovum presents a very clear outline, the continuity of which is uninterrupted, except at one end, where a well-marked *operculum* may be seen, as represented in the drawing.

"The size of these ova differs considerably; their average length is about $\frac{1}{250}$ th of an inch, and their breadth $\frac{1}{400}$ th.

"The interior of the cyst is occupied by granular matter, often contained within secondary and more delicate cysts or cellules, generally of a circular figure, and occasionally having within them a third still smaller cyst. The diameter of the latter is about $\frac{1}{4000}$ th of an inch, and of the secondary cysts $\frac{1}{1500}$ th of an inch is a common size, although their magnitude is very variable. The granules within the cells or cysts also differ much in size, but they are very commonly about $\frac{1}{8000}$ th of an inch in diameter.

"When the ova of the *Distoma* are compressed forcibly, the operculum is lifted up, or even separated entirely, and the granular matter extruded, with its containing cells or cysts generally broken.

"The operculum does not appear to exist in the smaller and immature ova. The drawing No. 2. represents this in some ova obtained from the uterus of the Fluke.

"Whether what is commonly called the ovum of the entozoon, may not be a cyst containing numerous ova within it, and furnished with an operculum, to allow of their extrusion when mature, and fit for propagation, appears to me to be an interesting question. At all events it should be ascertained if the cysts be discharged with the dung of the diseased sheep, whether the granules have escaped or not, and whether they are to be found in the pasturage of those localities, where the entozoon is sometimes known to be propagated so quickly as soon to infect entire flocks of sheep.

"I could never see anything like a small fluke in the outer cyst, at any period of its growth, although the operculum was often observed just ready to open and give exit to its contents, as above described.

"The granules may possibly be regarded as yolk-globules, in which case I apprehend the numerous secondary cysts, or cells, must be considered as so many different yolks.

"On the oval Corpuscles of the Cysticercus.

"If the opaque part near the head of this entozoon be gently pressed, a little rather viscid fluid will escape, which on examination will be found to be pervaded by a great number of oval corpuscles, presenting a very beautiful microscopic object. They have a remarkably distinct dark outline, with a brilliant surface, semitransparent, and apparently homogeneous, except very rarely, when they appear to contain an inner corpuscle or cellule.

"They are generally but slightly oval, their length often scarcely exceeding their breadth by a third, as exhibited in the drawing, though they may occasionally be seen nearly twice as long as they are broad. A common size of the corpuscles is about $\frac{1}{1300}$ th of an inch long, and $\frac{1}{2000}$ th broad.

"The bladder-like body of these hydatids is everywhere pervaded by distinct spherules, presenting a bright oil-like appearance, varying in diameter from $\frac{1}{20000}$ th to $\frac{1}{4000}$ th of an inch. They have no resemblance whatever to the oval corpuscles.

"Hydatids are described as being without discernible generative organs. Whether the remarkable oval corpuscles shown in the drawing be ova or gemmules, must be determined by future observation. That they are the former appears probable, from their form and general regularity of size. Besides they are situated in one particular part of the parent, never appearing in the walls of the transparent sac. If this conjecture should be confirmed, the cysticercus can no longer be regarded as destitute of any distinct generative organ, for the part in which the ova are contained will correspond to the uterus of the higher entozoa, and probably lead to a further knowledge of the method by which the different species of this genus are propagated.

"I am indebted to the kindness of Mr. Siddall for the accompanying drawings, which have been made by the aid of the camera lucida. As they were taken from dried specimens, the internal structure of the ova of the *Distoma* is not well exhibited, though the form is faithfully shown."

May 26.—William Yarrell, Esq., Vice-President, in the Chair.

A letter from Hugh Cuming, Esq., was read. This letter is dated Manilla, November 5, 1839, and gives an account of some cases of specimens forwarded to the Society. Mr. Cuming states that he has not yet been successful in procuring a certain Ruminant, known by the name Tamaroo, but he entertains hopes of having a specimen forwarded to England after him, he being about to return. With the exception of this animal, he had procured all the quadrupeds of the Philippines of which he could obtain any information. The letter, moreover, states that he observed two varieties of the Monkey he had sent home (*Macacus cynomolgus*), and which is the only spe-

cies found in the Philippine Islands; one was variegated with black and white, and the other is of a light chestnut colour, and varied with white. Only one of each of these varieties was seen by Mr. Cuming, and the variety was, in both cases, in company with ordinary coloured individuals.

A letter from the President of the Society, the Earl of Derby, was also read; it is dated Prescott, May 13, 1840, and relates to some crosses which have taken place among the animals in his Lordship's menagerie. "A female common Zebra (*Equus Zebra*)," says his Lordship, "has lately taken to my young Dshiggetai (*Equus hemionus*), and is the only animal he has yet appeared to notice in this way. The produce, if any, would, I should think, be curious.

"I think I have often heard that Foxes will not breed in confinement, but I have a female which, about two days since, produced three young; they only lived about two days. The sire is from America."

His Lordship has reason to believe that a female Fox also produced a similar litter about four years back, but destroyed them.

On the 'Great Water' of his Lordship's park, a Bernicle paired with, and constantly accompanied, a Canada Goose, but there was no produce; this happened last season. In the present one the same Bernicle has paired with a white-fronted Goose, and the pair have a nest with nine or ten eggs. It is not known, in either case, which was the goose and which the gander.

The Polish Swan has bred with the common species, and his Lordship further states, that this year a pair of their cross-breed have laid again, but the eggs are not yet hatched.

In a letter from Madame Power, dated Messina, March 25, 1840, which was read, that lady states that she had forwarded for the Society's museum some packages containing some bird-skins, and also some molluscous animals and zoophytes, preserved in spirits, from Sicily.

A paper by John Wyllie, Esq., describing the peculiar structure of the branchial appendages of one of the Indian *Siluridæ*, was read.

"The fish to whose singular branchial appendages I wish to draw the attention of the Society," says Mr. Wyllie, "is named 'Singee' in the Mahratta, and 'Bichoo-Mutchie' (Scorpion Fish) in the Hindostanni language. It is the *Silurus Singio* of Dr. Hamilton's 'Fishes of the Ganges.'"

"The following description is drawn from memoranda taken at Nagpoor, December 6, 1825:—

"B. 7; D. 6; P. $\frac{1}{6}$; V. 6; A. 65; C. 14; Cirrhi, 8.

"Length of body $7\frac{3}{4}$ inches, breadth at anus one inch. Head much depressed, very hard, without scales, terminating posteriorly in three equal spinous processes, resembling a trident.

"Body elongated, much compressed; above rounded, below carinated, naked. Colour, when alive, of a very dark olive green; when dead, of a bluish black. Ventral and dorsal fins opposite; pectoral quadrangular with one very strong sharp bony ray, and

six soft rays; anal extending as far as the tail; lateral line mesial.

"Cirrhi of nearly equal length, one pair arising immediately before the nostrils; another from the angles of the mouth; and a third and fourth from the lower jaw, near the angles of the mouth.

"Stomach small, with a moderate cul-de-sac; intestines equal, without cæca, of several convolutions, measuring seven inches in length.

"No air-bladder.

"The peculiar organs to which I wish to direct attention are situated exterior of the abdomen: there is one on each side, lying immediately over the transverse processes of the vertebrae; and in the angle formed between them and the spinous processes they are loosely attached to the surrounding parts, and covered only by the general integuments. They have the form of cylindrical tubes, are about the size of an ordinary black-lead pencil; they are closed at the posterior extremity, which extends within about three inches of the tail, and they open under the base of the cranium, between two of the branchial pairs. They are of loose cellular texture, of a whitish gray colour, speckled with numerous minute black points; they are traversed from one extremity to the other by a blood-vessel (vein?) of considerable size, into which numerous smaller branches open at right angles.

"These sacs are perhaps intended for reservoirs of water, to enable the animal, during its migrations from tank to tank, to maintain the gills in a constantly moist condition. They may also perhaps serve, in ordinary circumstances, as an extension of the respiratory surface, and the numerous blood-vessels that are seen on their coats would tend to give a probability to such a conjecture."

Mr. Ogilby pointed out the characters of a new species of Antelope, which was exhibited to the Meeting. This animal lived for some time in the menagerie, having been presented to the Society by W. Willshire, Esq., Corresponding Member, who procured it at Mogadore. It is closely allied to the *Antilope Dorcas* and *A. Arabica*, and most nearly resembles the latter in its colouring, but is readily distinguished by its much greater size; its total length, from the tip of the muzzle to the tail, being about forty-three inches, and its height twenty-eight inches: the ears of the Mogadore animal are moreover proportionately larger, measuring in height about $6\frac{3}{4}$ inches, or rather more. Like *A. Arabica*, it has a black patch on the upper surface of the muzzle, and a black line on either side of the face, extending forwards from the eye, and terminating above the angle of the mouth: the dark band on the flanks is very broad, and of a deep brown colour, inclining to black; there is also a distinct broadish black mark on each side of the rump; the fore knees are furnished with distinct black tufts. The specimen is a female, and has slender horns, about equal to the ears in length; the horns are indistinctly lyrated, in fact, nearly straight, and exhibit eleven or twelve annulations, four or five of which, at the base of the horn, are very close together. Mr. Ogilby stated that he had observed

specimens of the same species in the Paris Museum, and that it was the intention of M. F. Cuvier to have described them; he should therefore propose the name *Cuvieri* be used to distinguish the species.

The Secretary also called the attention of the Members present to a species of Musk Deer, from Sierra Leone, which had been brought from that part of Africa by Mr. Whitfield, who had kindly allowed it to be exhibited to the Meeting. In general colour, and in the markings on the throat, this species most nearly resembles the *Moschus Sanleyanus*, but its body has spots and markings nearly similar to those in the *M. meminna*; it is much larger, however, than either of these species, being, in size, about midway between them and the *M. moschiferus*. The chief interest attached to this animal is the locality in which it is found, the well-established species of *Moschus* being either from the continent of India or the islands of the Indian Archipelago. Mr. Ogilby stated that the present animal could not be identified with the *Moschus Guineensis* of Brisson, Gmelin, and some other of the older authors; it was therefore necessary to give it a new name, and he proposed for that purpose the name of *M. Aquaticus*, in allusion to the peculiar habits of the species which will be described more at length in the Transactions of the Society.

June 9.—William H. Lloyd, Esq., in the Chair.

A paper "On Parthenia, a new genus of Recent Marine Shells or Mollusks, containing British Species," by the Rev. R. T. Lowe, M.A., was then read.

GENUS PARTHENIA.

Testa eximie turrita, acuminata, imperforata, plerumque lactea, epidermide pallida s. fere nulla; spira apertura longiore; anfractibus plurimis, costis striisque eleganter sculptis, sæpe cancellatis. Apertura ecanaliculata, ovata, integra: columella simplex, antice effusa, postice aliquando torta s. plicata: labrum tenue, simplex.

Obs. Testæ figura et sculptura elegantissimæ, parvulæ. *Animal* corpore admodum spirali; pallio simplici, ecanaliculato; pede antice abrupte truncato, postice attenuato exappendiculato, operculifero. Tentacula duo, triangularia s. prismatica, basi coalita, oculis sessilibus, superne ad basin internam positis, approximatis. Buccæ labiales coalitæ, infra tentacula exsertæ, proboscidem abbreviatam, depressam, profunde emarginatam s. bilobam referentes. Operculum aperturæ fere magnitudine, corneum, tenue, ovatum, integrum; nucleo ?

Obs. Animal marinum, branchiis pectinatis, corpore capiteque simplicibus, sc. nec velo nec membranis neque ciliis instructum. Tentacula figura fere *Limnææ*; sed elongatiora, e membrana longitudinaliter ab apice ad medium basis conduplicata constare videntur. Figura pedis inter Gasteropodes non siphoniferos infrequentior, in *Rissois* tamen æque obtinet.

Genus et animale et testa distinctissimum, cum *Melaniis*, *Eulimis*, *Turritellis*, &c., a testaceologis recentioribus diutius confusum.

The group proposed for generic distinction consists of several shells remarkable for their elegance of form and sculpture, but which it has been neither easy to associate with others in established genera, nor advisable, in the absence of all knowledge of the animal, to place apart. Accordingly, they have been variously arranged by different authors. Philippi, in his excellent *Enumeratio Molluscorum Siciliæ* (Berol. 1836), whilst uniting some of them with several species of *Eulima*, Sow., under the head *Melania*, Lam., has not failed to remark their discrepancy as marine shells from the last-named genus, and to point out the probability of their formation into a genus or subgenus, "quando animalia eorum cognita erunt": the species which belong to *Eulima*, Sow., being, after Bronn, considered by him to be congeneric with *Niso* of Risso. The genus *Eulima*, as proposed by Risso, consisted of the same exceptionable kind of mixture; but being now ably defined by Sowerby, and restricted within its proper limits to the latter of these groups, the type of which is the *Turbo politus* of some British authors, I am induced to bring forward, in relation to the other, some materials obtained twelve or thirteen years ago, which at the time indeed immediately suggested the formation of the genus *Parthenia*, but which the progress of Conchology, in the more recent establishment of *Eulima*, seems to have rendered really interesting.

The genus *Turbonilla* (rectius *Turbinella*) of Risso, though perhaps composed in chief of true *Partheniæ*, is not so constituted, even should this supposition prove correct, as to supersede or clash with the reception of *Parthenia*. Its definition is extremely incomplete and faulty, and it differs no less in its limits than its constitution; whilst its very author places in his *Eulima* and in *Turritella* some undoubted species of *Parthenia*. The name, moreover, rightly spelled, is long preoccupied by a well-known genus of Lamarck.

The group, however, constituted as above, appears sufficiently distinct from every other. From *Melania* it is distinguished primarily by being marine instead of fluviatile, and in the shell being destitute of a dark-coloured epidermis. It differs from *Rissoa* or *Cingula*, Flem., in the animal, much as *Limnæa* does from *Physa*, and in the shell, as *Turritella* does from *Littorina*; whilst from *Eulima*, Sow., the shells are at once distinguished by their rough or sculptured, ribbed, and generally cancellated surface; and the animal wants the lateral membranes and subulate tentacula of *Turritella*, from which the shells also differ in the transverse ribs or plaits of the volutions, and in the shape of the aperture and of the opercle, the nucleus of which is also probably eccentric and anterior; but this, without destruction of the specimens, I cannot ascertain.

The name is formed from *παρθενος*, a virgin; the word *παρθενια*, virginity, expressing well, in contrast with *Melania*, the simple elegance and purity so remarkably characteristic of these shells, which are wholly colourless, and of a spotless milk or ivory whiteness.

Several recent species of this group are found in the Mediterranean, and two at least in the British seas. Others appear also to occur subfossil, in the tertiary beds of Sicily and Nice.

The animal of the shell, called by Montagu *Turbo unidentatus* (*Odostomia* of Fleming), would appear, from the observations of my friend, the Rev. M. J. Berkeley, to be very similar. But the shell, in most points, differs, except in having a fold or plait upon the columella. Still future observations may warrant possibly the modification of the characters of *Parthenia*, for the reception of this shell and its allies.

Species quædam.

1. *PARTHENIA BULINEA*. *P. testa subcylindraceo-attenuata, oblongiuscula, juniore ovato-tereti: anfractibus planis, elegantissime reticulato-cancellatis, striis spiralibus crebris æquidistantibus, transversas æquidistantes decussantibus; sutura distincta impressa: columella postice torta, uniplicata.*

α. subventricosa.

$$\frac{\text{Lat.}}{\text{Long.}} = \frac{1\frac{1}{2} - 1\frac{2}{3}}{5} \text{ lin.} : \frac{\text{Long. apertæ.}}{\text{Long. testæ}} = \frac{1\frac{1}{2}}{5} \text{ lin. vel } \frac{3}{10} \text{ millim.}$$

Turbonilla Humboldti, Risso, Hist. IV. 394. f. 63. male. *Testa junior.*

Tornatella? clathrata, Phil. Enum. 166.

β. gracilis, angustata.

$$\frac{\text{Lat.}}{\text{Long.}} = \frac{1\frac{1}{4} - 1\frac{1}{3}}{.5} \text{ lin.} : \frac{\text{Long. apertæ.}}{\text{Long. testæ}} = \frac{1\frac{1}{2}}{5} \text{ lin.}$$

Anfractus 8 in utraque varietate.

Hab. in mari Maderensi, rara; vv. Animal omnino lacteum.

Dredged in deep water in the bay called Labra at P^{ta} Saõ Lourenço, in the spring of 1827, by H. Richardson, Esq. This shell in form resembles a *Bulinus*.

2. *PARTHENIA TEREBRA*. *P. testa elongato-turrita, gracili, sensim attenuata: anfractibus convexiusculis, transverse obsolete costatis s. plicatis, striisque exiguis, concinnis, crebris, spiralibus, alias creberrimas, transversas, tenuissimas, plicasque decussantibus: sutura distincta, impressa.*

$$\frac{\text{Lat.}}{\text{Long.}} = \frac{2}{7} \text{ lin.} : \frac{\text{Long. apertæ.}}{\text{Long. testæ}} = \frac{1\frac{1}{2}}{7} \text{ lin. Anfr. 12.}$$

Turritella cancellata, Risso, Hist. IV. 110. f. 40?

Hab. in mari Maderensi cum priore rariss. v. m.

Of two examples dredged up without the animal, one is in perfect condition. The columella is quite simple, without any fold or plait. The whole shell is sub-opake or milk-white, and in form resembles a *Turritella*.

3. *PARTHENIA ELEGANTISSIMA*. *P. testa elongato-turrita, gracili, sensim attenuata, lævi: anfractibus convexiusculis, costis transversis validis, latis, obliquis, confertis, æquis sculptis: interstitiis lævibus, costis angustioribus; sutura simplici, distincta: columella postice subtorta.*

$\frac{\text{Lat.}}{\text{Long.}} = \frac{\text{vix } 1}{3} \text{ lin.}; \frac{\text{Long. apertæ.}}{\text{Long. testæ}} = \frac{\frac{3}{4}}{3} \text{ lin. vel } \frac{1\frac{1}{2}}{6\frac{1}{2}} \text{ millim.}$
 Anfr. 9-11.

Turbo elegantissimus, Mont. Turt., &c., &c.

Turritella elegantissima, Flem. Brit. An. 303. n°. 218.

Eulima elegantissima, Risso, Hist. IV. 123. n°. 296.

Melania Campanellæ, Phil. Enum. 156. t. 9. f. 5?

Hab. in mari Britannico, Mediterraneo; Maderensi, rariss. vv. Animal lacteum, omnino ut in *P. bulinea*, nisi quod tentacula obtusiora sunt.

Dredged with the former. Found also in 1824 at Sheean Ferry, near Appin, in Argyleshire.

Aliæ species videntur :

4. *Parthenia crenata* (*Turbo crenatus*, Mont. inedit. *Melania rufa*, Phil. Enum. 156. t. 9. f. 7?); quæ a *P. elegantissima* interstitiis costarum spiraliter striatis potissimum differt.

Hab. in mari Britannico rariss. vm.

5. *Parthenia pallida*. *Melania pallida*, Phil. Enum. 157. t. 9. f. 8. An *Turbo unicus*, Mont. Turt. Dict. 209, &c.?

Hab. in mari Siculo (Britannico?).

6. *Parthenia scalaris*. *Melania scalaris*, Phil. Enum. 157. t. 9. f. 9. An *Turbo simillimus*, Laskey, Turt. Dict. 209?

Hab. in mari Siculo (Britannico?).

The genus *Turbonilla* of Risso (Hist. IV. 224. ff. 70. and 72.) appears to contain some fossil species also of *Parthenia*, besides the recent one above referred to. Other species are indicated by Philippi as figured by Brocchi.

The following paper was next read. It is entitled "Observations on the Blood Corpuscles of the Snowy Owl and Passenger Pigeon," by George Gulliver, F.R.S., Assistant Surgeon to the Royal Regiment of Horse Guards.

"Although I have found generally less difference in the blood corpuscles of birds than in those of the Mammalia, yet in some of the former there are peculiarities in the size and shape of the red particles, which appear to me, after a careful examination of the blood of upwards of two hundred different species, deserving of especial attention. As examples of this kind, I select from my notes an account of the blood corpuscles of the Snowy Owl and Passenger Pigeon, and, by way of comparison, of one or two other allied species.

"In the following measurements, as noted in the first observation, the common-sized corpuscles are first indicated; then the small and large extremes, and lastly, the average size, deduced from the whole. They are all expressed in fractional parts of an English inch.

Obs. 1.

In the Snowy Owl (*Surnia nyctea*).

Long Diameter.

1.1600	} Common	sizes.
1.1500		
1.1455		
1.2000	} Extreme	sizes.
1.1333		

1.1550 Average.

Short Diameter.

1.4000	} Common	sizes.
1.4570		
1.5333	} Extreme	sizes.
1.3000		

1.4042 Average.

The nuclei of the corpuscles, exposed by the action of acetic acid, were generally 1-3200th of an inch long, and 1-10666th broad.

Obs. 2.

In the Common Brown Owl (*Syrnium Aluco*).

Long Diameter.

1.2000
1.1895
1.1777
1.2400
1.1714

1.1930

Short Diameter.

1.4000
1.3555
1.5333
1.3000

1.3801

Obs. 3.

In the Passenger Pigeon (*Columba migratoria*).

Long Diameter.

1.2133
1.2000
1.1895
1.1777
1.1714
1.2666
1.1542

1.1909

Short Diameter.

1.4800
1.4570
1.5333
1.4000

1.4626

Obs. 4.

In the Russet Pigeon (*Columba rufina*).

Long Diameter.

1.2400
1.2286
1.2666
1.2000

1.2314

Short Diameter.

1.3428
1.4000
1.3000

1.3429

"From the observations on the blood corpuscles of the Snowy Owl, it results that their average long diameter is 1-1550th, and their average short diameter 1-4042nd of an inch, so that their length is

considerably above twice and a half greater than their breadth; while in the Brown Owl the corpuscles are scarcely twice as long as they are broad.

“Now both the absolute size of the latter, as well as the relation between their long and short diameters, approach very nearly to the dimensions frequently presented by the corpuscles of various birds. But in the Snowy Owl the corpuscles are not only peculiarly long, in proportion to their breadth, but their absolute length is much greater than is often to be found in the red particles of other birds, whether belonging to the rapacious order or not. Indeed it is probable that the difference generally between the blood-disks of any two orders of birds is not greater than that now indicated between the disks of two species of one natural family, the *Strigidæ*.

“The corpuscles of the Snowy Owl, therefore, are very remarkable and characteristic, as any one may immediately see who will take the trouble to compare them with those of the Common Brown Owl. I have examined the blood of several other species of this family, and find the size and shape of the corpuscles of the Barn Owl (*Strix flammea*) to approximate most nearly to those of the Snowy Owl.

“It will be seen that the nuclei of the blood particles of the Snowy Owl, exposed by acetic acid, were fully three times the length of their breadth; and it may be noticed incidentally, that in most birds the nuclei thus exhibited have a more elongated ellipse than the outline of their envelopes*.

“We might expect to find an exact resemblance between the elementary parts of such a truly natural family as the *Columbidæ*, and yet the observations show a striking difference between the blood corpuscles of the Passenger and Russet Pigeons, the average long diameter of the former being 1-1909th, and the short diameter 1-4626th of an inch, while the latter are 1-2314th of an inch long, and 1-3429th broad. Although I have examined the blood of many different species of the *Columbidæ*, in no instance did the corpuscles agree in figure with those of the Passenger Pigeon; in the Turtle Dove (*Columba Turtur*) the long diameter appeared to be nearly similar, but the short diameter agreed with that observed in the disks of the Russet Pigeon. Hence there was a remarkable difference in shape, and the corpuscles of the Passenger Pigeon, as far as I have yet ascertained, are quite peculiar, since the singularly narrow ellipses which they present have not hitherto been found in the red particles of other species of the *Columbidæ*.

“It should be recollected, however, that the results of my observations may exhibit differences rather apparent than real, since our knowledge of the blood corpuscles is at present so limited, that we are not sure whether their size and shape may not be subject to some variation in relation to season, to the habits, or to certain conditions of the animal. In Man, and some of the other Mammalia, I have seen remarkable changes in the appearance of the blood corpuscles,

* See Dublin Medical Press, No. 59, March 4, 1840.

apparently in connection with disease; and their size and shape are undoubtedly liable to modifications, from the effect of causes which have not yet been clearly explained. The observations recorded in this paper have been made with so much care, to obviate any source of fallacy, that I am disposed to place much confidence in the results; but even if it should ultimately appear that the differences which I have described are not permanent, but merely within the limits of variation to which the blood-disks are liable, this would be some addition to our knowledge of these curious bodies, and would, at all events, be sufficient to reconcile the numerous discrepancies apparent in the measurements of various eminent observers.

“In conclusion, it may be remarked, that however paradoxical the history of the red particles may be, still, that of the blood generally is in many respects equally so. As we can only expect to obtain a knowledge of the physiology of the corpuscles by the multiplication of observations, it is especially desirable that persons residing abroad should avail themselves of opportunities of examining the blood of such animals as are not easily to be seen alive in this country. Among the birds, it may be mentioned that an examination of the blood of the different species of Temminck's orders *Anisodactyli* and *Inertes* is especially required; and when made, it is not improbable that some interesting results may be obtained.”

June 23.—William Yarrell, Esq., V.P., in the Chair.

Mr. Ogilby characterized a new species of Monkey, under the name of *Papio ochreatus*. “I saw this animal” (observed Mr. Ogilby) “in a travelling collection last June. It was of a uniform dull black colour on every part of the body, both above and below, except the arms and legs, from the paws to the elbows and knees, respectively, which were dark gray, as was likewise the space between the scrotum and the callosities; the scrotum itself was dirty flesh-colour; the face and ears naked and black; the naked part of the hands and feet brown, and there was a large naked patch, of the same colour, surrounding the callosities; but whether natural, or the effect of accident, I am unable to determine. The ears were rounded, and less pointed than in the *Papios* generally; the countenance resembled that of the Pig-tailed Baboon (*P. Nemestrina*), but the face was more attenuated; size that of the Pig-tail. I was unable to learn whence the individual here described had been obtained. It constitutes a very distinct species, and may be characterized as follows:—

“The Booted Baboon, *PAPIO OCHREATUS*; *P. supra subtusque niger, brachiis et cruribus canis.*”

A species of *Trionyx*, or, according to MM. Dumeril and Bibron, *Gymnopus*, was exhibited. This specimen had lived for some time in the Society's menagerie, having been sent from the Euphrates by Colonel Chesney.

The following description and observations relating to this animal were communicated by Mr. Martin:—

“Total length, from the tip of the muzzle to the end of the tail, two feet; width about one foot; head and neck, measuring to the anterior edge of the carapace, seven and three quarters inches: carapace slightly convex and oval, slightly truncated posteriorly; composed of nine costal plates, the ribs being eight in number; a double mesial furrow runs along the back, leaving a slightly convex elevation between them: between the first, and most anterior, of these plates and the second, are two depressions, each about half an inch in diameter, placed near the mesial line, and separated by a space less than a quarter of an inch in extent. The whole upper surface of the carapace, excepting at the margin, irregularly reticulate. The depressions between the costal plates are well marked. The length of the carapace is nine inches, and the breadth seven and three quarters inches; on the sides of the body the coriaceous membrane extends about two inches beyond the lateral margins of the carapace, the ribs themselves extending about one inch and a half beyond the carapace. Towards the hinder part of the body the membrane gradually increases in width, and posteriorly over the tail it had attained a width of nearly six inches: here the free portion of the membrane is about two and a half inches in width. The head is in the form of an elongated triangle; the snout is considerably produced and attenuated: the width of the head at the base is two inches and a quarter; the total length of the skull is three inches five lines; the space from the eye to the upper lip, beneath the nostrils, is eleven lines; the space between the orbits is five lines; on the vertex, above and between the orbits, the skull is smooth and convex. In both the fore and hind feet the first or front claw is the largest. The tail is rather short and thick; its length is about four inches and a half.

“When alive this animal was of an uniform mud colour, slightly tinted with olive-green.

“In many respects this animal agrees with the *Gymnopus Ægyptiacus* (*Trionyx Ægyptiacus*), as described by M. Bibron, but neither the head nor the margin of the carapace is spotted with yellowish white, as in that species; besides, the two nearly confluent depressions on the anterior part of the carapace are not alluded to in the account of *G. Ægyptiacus*; they are, however, very conspicuous in the animal in question. There are, it may be added, no pellucid scales, placed in a transverse direction, on the under surface of each elbow, nor are there any depressed convex tubercles, either anteriorly or posteriorly, on the cartilaginous expansion of the carapace, as are often, though not invariably, found in the *G. Ægyptiacus*.

“With respect to the *Gymnopus Euphraticus* (*Trionyx Euphraticus*), originally described by Olivier (*Voyage en Perse*, tom. iii. p. 453, tabl. 41.), the carapace is described as being broader behind than before, which, if reference be extended only to the osseous disc, is not the case in the present animal. As in that species, however, the circumference of the carapace is smooth, and the skin is folded at the elbow-joint above, but does not simulate scales. The circumstance of a mesial depression, or rather double channel, with a convex line between, down the vertebral column, is not noticed as cha-

racteristic of the *G. Euphraticus*, nor yet are the smooth anterior oval foveæ.

“ Still, however, it is not improbable that the animal in question may be identical with that described by Olivier; but it remains to be seen whether his species be distinct from *G. Ægyptiacus*, a point which his short and imperfect account does not enable us to solve.

“ The sternum of the specimen having been removed by the animal preserver, and lost, has prevented my noticing this part in the above description.”

A skull of an adult Chimpanzee, recently purchased by the Society, was exhibited, and Professor Owen pointed out the distinguishing characters between this and the skull of the Orang, also on the table; he also called attention to certain points of agreement between this skull and that of the Hottentot.

ROYAL SOCIETY OF EDINBURGH.

December 21, 1840.

At this, the second ordinary meeting of the year, communications were read—“ On the Nutrition of Vegetables, by Dr. H. Madden;” and “ On the Fossil Fishes of the Old Red Sandstone of Orkney, among which is a nondescript Species of *Diplopterus*, by Dr. Traill.”

Beautiful specimens of the fossil fishes of Orkney were exhibited and presented to the Society, chiefly from the “ Orkney Slate,” considered as a portion of the old red sandstone formation; and the new species of *Diplopterus* was proposed to be dedicated to the Ichthyologist of Neufchatel, as *D. Agassiz*. It was stated to be characterized specifically by its large head and rounded snout, wide mouth and large scales. A very interesting collection of the fossils of the old red sandstone, from different parts of Scotland, also lay upon the table.

At the conclusion of public business an important resolution was moved by the Council—“ That the Society do vote the sum of £300 to Sir John Robison, in acknowledgment of his long services as general Secretary,—that being the form adopted in the case of each of his predecessors.” This was carried after some difference of opinion had been expressed upon the principle of the remuneration.

January 4, 1841.—The only paper read was the conclusion of one commenced at a former meeting, by Dr. Alison, “ On certain Physiological Inferences which may be drawn from the study of the Nerves of the Eyeball.” From the length of which paper the other communications were delayed. Sir Charles Bell at some length combated the inferences drawn by the author.

January 18.—Professor Syme communicated a paper by John Goodsir, Esq., M.W.S., “ On the mode in which musket-balls and other foreign bodies become enclosed in the ivory of the tusks of the Elephant.”

In this paper, the author, after stating the various doubts and contradictory opinions entertained by Camper, Blumenbach, Lawrence

and Cuvier on the subject, observed that the principal difficulty has been to explain how a tusk—a non-vascular organ—can repair injuries which it has sustained, and especially how shot-holes in its parietes are filled up. He remarked that in proceeding to investigate this subject two facts should be borne in mind; 1. that a tusk undergoes no change from vital action in its tissue or configuration after it is once formed; and, 2. that it is an organ of double growth, the ivory being formed from without inwards, the cement from within outwards. He then proceeded to state, that in all cases of wound of the tusk-pulp, the latter ossifies round the wound as the first step towards the separation of the injured portion from the system. The ivory constituting this ossification he termed *irregular*, and announced its anatomical identity with the peculiar ivory which fills the cavity of the tusk of the Walrus, and the teeth of the Cetacea, consisting of central ramifying Haversian canals, of secondary medullary tubes, and of terminal wavy bundles of Retzian tubes, interspersed with irregular cells. The irregular ivory is limited in its formation, which is terminated by the closure of the orifices of the Haversian canals, and the consequent separation of the enclosed portion of ramified pulp, from the general system. After this closure of the orifices of the Haversian canals, the irregular ivory assumes the appearance of a mass covered with stalactitic processes, and its surface stands in the same relation to the surface of the general pulp, as to the internal surface of the general ivory of the tusk. Regular ivory—that composed of undulating Retzian tubes perpendicular to the surface of the pulp—now forms upon the surface of the irregular ivory, and the latter at last becomes enclosed. When a musket-ball passes across the cavity of a tusk, the wound of the surface of the pulp ossifies, but the track does not necessarily do so. There are two exceptions, however, the author stated, to the non-ossification of the track; that part of it where the ball lodges, and the whole or any part of it which may suppurate or form a sinus. In the first case the irregular ivory forms an isolated hollow sphere around the ball, and studded with stalactitic masses, such as have been figured by Ruysch, &c., and specimens of which were exhibited to the Society; in the second it assumes the form of a tube or irregular shell leading to one of the shot-holes.

Mr. Goodsir then went over in detail the various kinds of wounds which the Elephant's tusk might sustain, as observed by himself and described by others. Foreign bodies may enter the tusk from above, through the base of the pulp, without wounding the ivory. A case of this kind is described by Mr. Combe in the Philosophical Transactions. A ball may enter through the free portion of the tusk, and the hole become closed by the protruding portion of the ossified pulp, and various curious appearances may present themselves, according as the ball may lodge in the opposite wall, or sink below the level of the shot-hole, or be left behind it by the advance of the tusk. Balls or spear-heads may also penetrate the tusk through its socket, and these are the wounds which have so much puzzled anatomists. In such cases, the hole, when filled up, is closed by the ossification of the pulp in-

ternally, and by the application to this externally of cement, formed by the follicle of the socket, which, although wounded, was proved by specimens to be able occasionally to perform its function,—a task which is generally completed by the advance of the hole opposite another portion of the membrane. When the hole is not completely closed, the attempt to accomplish it is exhibited in the protrusion of portions of ossified pulp, and in the rounded and tubercular appearance of the perforated cement. It was also stated that fractures of the enclosed portion of the tusk are healed by the same process, without any reproduction of true ivory, and that after all severe wounds the growth of the organ is stunted, so that the portion formed after the injury is of diminished diameter. From the whole investigation of the subject, Mr. Goodsir concluded that doubts might be removed and contradictory opinions reconciled by bearing in mind the following facts: 1. that a tusk is an endogenous as well as an exogenous organ; 2. that the pulp ossifies round foreign bodies; and, 3. that the membrane of the follicle plays an important part in all wounds of the tusk through the socket.

Professor Traill communicated an analysis of the Berg Meal, from Umea, Lapmark. It was discovered about 100 miles west of Umea, and being subjected to various tests, was found to be composed of

22 organic matter, combustible.

71.13 silica.

5.31 alumina.

0.15 oxide of iron.

98.59

Loss.

100.

When subjected to a high magnifying power, it was found to exhibit imperfect fragments of Ehrenberg's Infusoria; and some portions of it examined in a similar manner by Dr. Greville, confirmed Dr. Traill's opinion of an animal origin; while at the same time he discovered a few forms of those minute Algæ which contain silex.

WERNERIAN NATURAL HISTORY SOCIETY.

November 14, 1840.—The following Gentlemen were elected the Office-Bearers for the ensuing year:—

President, Robert Jameson, Esq., F.R.S.S.L. & E., Prof. of Nat. Hist. in the University of Edinburgh.

Vice-Presidents, Dr. Walter Adam; Dr. T. S. Traill, F.R.S.E.; W. A. Cadell, Esq., F.R.S.S.L. & E.; Dr. Robert Hamilton, F.R.S.E.

Secretary, Dr. Pat. Neill, F.R.S.E.—*Assistant Secretary*, T. J. Torrie, Esq., F.R.S.E.—*Treasurer*, A. G. Ellis, Esq.—*Librarian*, James Wilson, Esq., F.R.S.E.—*Assistant Librarian*, R. J. H. Cunningham, Esq.—*Painter*, P. Syme, Esq.—*Assistant*, W. H. Townsend, Esq.

Council, Dr. Robert Graham, F.R.S.E.; Sir William Newbigging, F.R.S.E.; David Falconar, Esq.; Dr. Robert Paterson; Edward Forbes,

Esq.; Robert Stevenson, Esq., F.R.S.E.; David Milne, Esq., F.R.S.E.; John Stark, Esq., F.R.S.E.

Met in the University, on the 12th of Dec., Professor Traill in the Chair, when there were read interesting notes of an expedition to the Sutledge and in the Himmalehs, by Mr. Jameson, assistant-surgeon in the Honourable Company's Service, and nephew of the Professor of Natural History in the University.—A paper on the frozen soil of North America, by Dr. Richardson, of Arctic celebrity. It appears that, during the past years, 1838 and 1839, pits were dug at the different fur stations of the Hudson's Bay Company, and the temperature tried with thermometers sent from England. Near York Factory the soil was found frozen to the great depth of seventeen feet; but the average yearly freezing at most of the stations does not exceed two or three feet.

Mr. Goodsir read a paper 'On certain peculiarities in the structure of the Short Sun-fish (*Orthogoriscus Mola*).'

The author first described a *tough, white tissue*, which envelopes the whole body of the animal, and which is converted into gelatine by boiling. Under the microscope it is seen to be composed of a congeries of primitive cells, with nuclei and nucleoli. No true dermis can be seen, and the gelatinous vesicular tissue, which varies from half an inch to six inches in thickness, and which contains in its substance the peripheral parts of the cartilaginous skeleton, must be looked upon as the true skin, or more correctly, as a mass of the primitive vesicular tissue of the embryo-fish which has never been converted into fibrous tissue. The author next alluded to the peculiar *tail* of the Sun-fish, and explained the arrangement of the skeleton upon which this depends, viz. the stunting of the spinal column, which terminates in simple coccygeal vertebræ, each of the caudal fin rays being supported upon free interspinous bones, the whole arrangement exhibiting a natural analysis of the tail in the class of Fishes. He then adverted to the total deficiency of the *lateral muscles* of the spine and of the muscles of the abdomen, and showed that the want of the former was supplied by the enormous development of the *muscles of the dorsal and anal fins*. Lastly, the author alluded to the embryonic condition of the tissues in the order of Fishes to which the *Orthogoriscus* belongs, and to the existence of certain general teleological laws, viz. the progressive development, and the arrest of development, of tissue in the animal series, and the subordination of tissue to form.—Dr. Traill laid on the table some large and beautiful specimens of carbonate of baryta, from a new locality, in North Wales. This mineral is found in considerable veins, traversing the clay-slate which lies below the carboniferous limestone, between Holywell and Denbigh, and it is worked for the purpose of being mixed up with white-lead paint.

DEVON AND CORNWALL NATURAL HISTORY SOCIETY.

The Members of the Devon and Cornwall Natural History Society met for the first time on Monday evening, the 4th of January, in their new rooms, at the Royal Union Baths, Plymouth. There was a crowded attendance of Members and their friends, amongst whom

were many ladies resident in the town and neighbourhood. This Society has been established about three years, and numbers above a hundred Members. Lectures are delivered weekly during the six summer months, and monthly conversazioni held during the winter. Zoological, Botanical, Geological and Statistical Sections have been formed, which meet at stated periods, and from which much valuable local information may be anticipated. Lieut.-Col. Hamilton Smith, K.H., K.W., F.R.S., F.L.S., &c. &c. &c., the well-known naturalist, is the President of the Society.

Captain Creyke, R.N., one of the Vice-Presidents, was requested to preside on this occasion.

Capt. Creyke, on being called to the chair, mentioned the encouraging prospects of the Society on the opening of their new rooms at the commencement of the new year, and the pleasing business of the evening, the presentation of the portrait of their highly talented and esteemed President.

A testimonial relative to this gratifying object having been read by Mr. Markes, as Secretary of a Committee appointed for the purpose, Mr. G. W. Soltau congratulated the Society upon having obtained a room so well qualified for the delivery of its Lectures, and possessing such excellent accommodation for the reception of the Museum, which he hoped at no very distant period would rival any in the West of England, and in a situation so accessible to country subscribers and to all who might visit the neighbourhood; and alluded to the advantages of such Societies from that friendly feeling which is engendered amongst all classes in the search of truth and investigation of nature.

"Plymouth," observed Mr. Soltau, "presents peculiar attractions for the formation of a Natural History Society, when we reflect that we are situated in one of the largest harbours of England, which daily offers additions to our Museum, obtained from every quarter of the globe; that we are situated in the midst of the most extensive mining district in Britain, and that our soil produces some of the rarest specimens of the vegetable world. We have now a place suitable for the reception of those wonders of nature, and which is at all times open to any individual who may take pleasure in their investigation; and allow me specially to remark, that we are most ready at all times to further and assist the most humble inquirer after knowledge. Allow me now, in behalf of several of the Members of this Institution, to present the portrait of Lieut.-Col. Hamilton Smith to this Society. His name, his talents, his acquirements, are too well known here, are too well known wherever science is appreciated or knowledge sought, to require any remarks from me. Long, long may the original of that portrait remain amongst us, to benefit us by his counsel, to aid us by his advice, and add lustre to the Devon and Cornwall Natural History Society!"

The Chairman, having warmly expressed his sense of the talents and worth of the President, and the obligations which he had conferred upon the Society, the adoption of the testimonial proposed by the Committee having been carried by acclamation, the Chairman resigned the chair to Lieut.-Col. Hamilton Smith, who delivered the following address:—

"Gentlemen,—At length we have the pleasure of meeting in our new locality; in a situation where I trust the Society will long continue to flourish in zeal and unanimity, with advantage to the studious portion of these towns and honour to itself. The situation where we are now assembled is one of the most convenient that could be selected, for Members residing at opposite distances will find it nearly central. The space we already possess, with the additional rooms which we shall obtain on or before next Midsummer,

will supply all the accommodation the Society can reasonably want for some years ; and should the pursuit of natural history become so prosperous that by that time our space within this building should become insufficient, I am sure every Member present will admit such a result would be one of congratulation more than regret. As far as my own opinions are concerned, I feel we are now in possession of a Lecture Room sufficient for the wants of the Society, and of additional space for the exhibition of our geological and mineralogical specimens, for a Committee Room and Library, and for a Store Room, all on one floor, exclusively tenanted by ourselves, in a handsome building and remote from noisy interruptions. I deem it a favourable omen, that on this day of our first assembling here the Meeting should be graced by the presence of ladies. Here let us hope that we shall often be again honoured by their presence ; nay, more, that they will deem it time well employed, occasionally to come and participate in some branches of our pursuits. Here we may look forward, in the course of next August, to find a portion of the British Association, such, for example, as the Medical Section, promulgating and discussing some of those immensely important discoveries which the zeal and profound abilities of the first men of their class in Europe are constantly bringing forward on occasion of their Annual Meetings ; and before I proceed, I beg to announce to the Society, that I have received an official communication from the Plymouth Council, appointed to make the preparatory arrangements,—a communication which the Secretary will have the goodness to read to you in the course of this evening. But to proceed : it is in this room I fondly hope the Society will pursue, with renovated spirit, the several subjects of inquiry embraced by its Sections : here Zoology and Botany will receive their due share of attention ; Geology and Mineralogy will be carried on with that enlightened zeal which is already beginning to bear fruit in the vicinity. Here, as soon as fit elements can be created, I shall be anxious to propose the formation of an Agricultural and Horticultural Section, with a view of spreading in these counties, among the smaller proprietors and agriculturists, information on the progress made in other districts and abroad."

The President then expressed the sincere gratification he felt at the spontaneous and valuable testimony of approbation of his exertions in the cause of science, and of personal regard which he had received.

The letter from the Local Council stated that the British Association would visit these towns in the early part of the ensuing autumn, and that the liberal support of the nobility and gentry of the two counties was looked forward to with confidence by the Council.

Mr. J. C. Beliamy, one of the Curators, announced the following donations to the Society since the last Meeting :—

A valuable collection of Minerals, from Sir George Magrath ; Fossils, Minerals, Birds and Shells, Rev. W. S. Hore ; Minerals, W. R. Newton, jun. ; Land Shells of Devon and Cornwall, Rev. C. A. Johns ; Coral, Lieut.-Col. H. Smith ; *Ornithorhynchus paradoxus*, Capt. Smith ; Fossils, Dr. Tripe ; Birds, Mr. A. Pincombe ; Birds, Rev. F. Lyte ; Grasses, &c., Adj. Stevens, R.M.

The Rev. C. A. Johns, F.L.S., rose and said, " I cannot allow the evening to pass without proposing a resolution, which I am confident will meet with the cordial support of every Member present. We are all aware that the very being of a Natural History Society depends upon its Museum ; for without the opportunity of constantly referring to specimens, neither the tyro nor the proficient in natural history can expect to derive much benefit. Through the kindness of our numerous Members our Museum already contains a great number of specimens ; but this is not enough, for without order and arrangement their value is greatly diminished. This desirable object was effected, so far as space would allow, in our late rooms, and for this we



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