EXPLANATION OF PLATE XXXII.

Diagrammatic representation of affinities of Birds according to their intestinal convolutions.

All the names between the two concentric rings refer to Birds which are cyclocœlous.

All the birds within the inner concentric circle are orthocœlous.

Underlined names refer to telogyrous formation.

Relationship is indicated by the excentric circles and by dotted connecting lines.

June 4, 1889.

Osbert Salvin, Esq., F.R.S., Vice-President, in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of May 1889 :—

The total number of registered additions to the Society's Menagerie during the month of May were 172 in number. Of these 121 were acquired by presentation, 6 by exchange, 9 by deposit, 21 by purchase, and 15 by birth. The total number of departures during the same period, by death and removals, was 124.

Amongst these I may call attention to an albino variety of the Cape Mole-Rat (*Georychus capensis*), presented to the Menagerie, May 1st, by the Rev. G. H. R. Fisk, C.M.Z.S. The ordinary colour of this Rodent is a uniform grey; the present specimen, however, is nearly pure white with black eyes. It lives entirely under the earth like a Mole, and is an interesting animal, though hardly suitable for public exhibition.

Mr. H. E. Dresser exhibited and made remarks on some eggs of the Adriatic Black-headed Gull (*Larus melanocephalus*) and of the Slender-billed Gull (*Larus gelastes*), which had lately been obtained at their nesting-places in the marshes of Andalusia by Col. Hanbury Barclay, F.Z.S., and himself.

The following papers were read :—

1. On the Mental Faculties of the Bald Chimpanzee (*Anthropopithecus calvus*). By GEORGE J. ROMANES, F.R.S., F.Z.S.

[Received June 4, 1889.]

The female Chimpanzee, which has now been in the Society's menagerie for nearly six years¹, has attracted general notice, not only on account of her peculiar zoological characters, but perhaps still more on account of her high intelligence. This is conspicuously displayed by the remarkable degree in which she is able to understand the meaning of spoken language—a degree which is fully equal to that presented by an infant a few months before emerging from

¹ Cf. Bartlett, P. Z. S. 1885, p. 673, pl. xli.

infancy, and therefore higher than that which is presented by any brute, so far at least as I have met with any evidence to show. Nevertheless, the only attempts that she makes by way of vocal response are three peculiar grunting noises—one indicative of assent or affirmation, another (very closely resembling the first) of dissent or negation, and the third (quite different from the other two) of thanks or recognition of favours. In disposition she is somewhat capricious, though on the whole good-humoured, fond of her keepers, and apparently never tired of a kind of bantering play which off and on they keep up with her continually. By vocalizing in a peculiar monotone (imitative of the beginning of her own "song"), they are usually able to excite her into the performance of a remarkable series of actions. First she shoots out her lips into the well-known tubular forms (depicted in Darwin's 'Expression of the Emotions,' p. 141), while at the same time she sings a strange howling note, interrupted at regular intervals: these, however, rapidly become shorter and shorter, while the vocalization becomes louder and louder, winding up to a climax of shrieks and yells, sometimes accompanied with a drumming of the hind feet and a vigorous shaking of the network which constitutes her cage. The whole performance ends with a few grunts.

A year or two ago it occurred to me that I might try some psychological experiments on the intelligence of this animal. The circumstances in which she is placed, however, did not prove favourable for anything like systematic instruction. Being constantly exposed to the gaze of a number of people coming and going, and having her attention easily distracted by them, the ape was practically available for purposes of tuition only during the early hours of the morning, before the menagerie is open to the public; and, as a rule, I did not find it convenient to attend at that time. Therefore, the results which I am about to describe do not in my opinion represent what might fairly have been expected under more favourable conditions; if the Chimpanzee could have been kept as a domestic pet for a few months (as I kept a *Cebus* kindly lent me for the purposes of psychological observation by this Society), there can be no doubt that many much more interesting results might have been obtained. Nevertheless, it appears to me that even those which thus far have been obtained are worthy of being placed on record; and although some of them have already been published a few months ago in my work on 'Mental Evolution in Man,' since that time some further progress has been made; and therefore in the present paper I will state together all the facts which have been hitherto observed.

Having enlisted the intelligent cooperation of the keepers, I requested them to ask the ape repeatedly for one straw, two straws, or three straws. These she was to pick up and hand out from among the litter in her cage. No constant order was to be observed in making these requests, but whenever she handed a number not asked for, her offer was to be refused, while if she gave the proper number her offer was to be accepted, and she was to receive a piece

of fruit as payment. In this way the ape was eventually taught to associate these three numbers with their names. Lastly, if two straws or three straws were demanded, she was taught to hold one straw or two straws in her mouth until she had picked up the remaining straw, and then to hand the two straws or the three straws together. This prevented any possible error arising from her interpretation of vocal tones—an error which might well have arisen if each straw had been asked for separately.

As soon as the animal understood what was required, and had learnt to associate these three numbers with their names, she never failed to give the number of straws asked for. Her education was then extended in a similar manner from three to four, and from four to five straws. Here, for reasons to be presently stated, I allowed her education to terminate. But more recently one of the keepers has endeavoured to advance her instruction as far as ten. The result, however, is what might have been anticipated. Although she very rarely makes any mistake in handing out one, two, three, four, or five straws, according to the number asked for, and although she is usually accurate in handing out as many as six or seven, when the numbers eight, nine, or ten are named, the result becomes more and more uncertain, so as to be suggestive of guesswork. It is evident, however, that she understands the words seven, eight, nine, and ten to betoken numbers higher than those below them; and if she is asked for any of these numbers (*i. e.*, above six), she always gives some number that is above six and not more than ten; but there is no such constant accuracy displayed in handing out the exact number named as is the case below six. On the whole, then, while there is no doubt that this animal can accurately compute any number of straws up to five, beyond five the accuracy of her computation becomes progressively diminished.

It is to be noticed that the ape exhibits some idea of multiplication; for she very frequently (especially when dealing with numbers above five) doubles over a long straw so as to make it present two ends, and thus to appear as two straws. Any of the comparatively rare errors which she now makes in dealing with numbers below six are almost invariably due to her thus endeavouring to duplicate her straws. In this connexion it is to be remembered that, owing to the method above described (whereby the ape is required to place each straw separately in her mouth until the sum asked for is completed), when any high number is demanded, a considerable tax is imposed upon her patience; and as her movements are deliberate while her store of patience is but small, it is evident to all observers that the doubling of the straws is intended to save trouble by getting the sum completed with greater rapidity than is possible when every straw is picked up separately. Of course we do not recognize these doubled straws as equivalent to two straws, and therefore the persistency with which she endeavours to palm them off as such is the more noteworthy as evidence of her idea of multiplication. Moreover, I am disposed to think that the uncertainty which attends her dealing with the numbers six and seven is more largely due to her

losing patience than to her losing count; although after seven I believe that her computation of the numbers themselves becomes vague, or merged in a merely general idea of many. It may also be stated that while picking up the straws and placing them in her mouth she looks only at the straws themselves, and not at the person who asks for them: therefore she is certainly not actuated in her responses by interpreting facial expression, unconscious gesture, &c., as is no doubt the case with many dogs which, on this account, are sometimes accredited by their owners with powers of "thought reading." It is needless to add that, after asking for the number of straws required, we remain silent till the ape has handed them out.

It is not necessary—indeed it would be unreasonable—to suppose that in this process of "counting" the ape employs any system of notation. We know from our own experience that there is counting and counting—*i. e.*, distinguishing between low numbers by directly appreciating the difference between two quantities of sensuous perception, and distinguishing between numbers of any amount by marking each perception with a separate sign. The extent to which the former kind of computation can be carried in the case of man has been made the subject of a careful research by Prof. Preyer of Jena (*Sitzungsb. d. Gesell. f. Med. u. Naturwiss.* 1881). His experiments consisted in ascertaining the number of objects (such as dots on a piece of paper) which admit of being simultaneously estimated with accuracy, and it was found that the number admits of being largely increased by practice, until, in the case of some persons, it may rise to more than twenty. But, of course, in the case of a brute it is not to be expected that such a high degree of proficiency even in this non-notative kind of "counting" should be attainable. The utmost that could here be expected is that a brute should exhibit some such level of ability as is presented by a young child, or by those savages whose powers of accurate computation do not appear to extend further than numbers which we write as units¹. It was in view of such considerations that I did not attempt to carry the education of this ape beyond the number five; and the result which has attended subsequent endeavours to teach her numbers as high as ten is, as previously remarked, exactly what one might have anticipated. It may here be added that in the only records with which I am acquainted of animals exhibiting any powers of numerical computation, these powers have not extended beyond the number five. Thus, for instance, in his well-known account of these powers as presented by rooks, Leroy says:—"To deceive this suspicious bird the plan was hit upon of sending two men into the watch-house, one of whom passed out while the other remained [to shoot the bird on returning to her nest]; but the rook counted and kept her distance. Next day three went, and again she perceived that only two returned. In fine, it was found necessary to send five or six men to the watch-house in order to throw out her calculations"². Again,

¹ See, for example, Galton, 'Tropical South Africa,' p. 213.

² "Letters," &c.

Houzeau tells us that mules used in tramways at New Orleans have to make five journeys from one end of the route to the other before they are released, and that they make four of these journeys without showing any expectation of being released, but begin to bray towards the end of the fifth¹. Lastly, the keeper of the Sea-Lions now in the menagerie has recently taught one of these animals to "count" as far as five. His method is to throw pieces of fish in regular succession, which the animal catches one by one. He throws them in series of fives, and, before the commencement of any series, he tells the seal to miss the first, the second, the third, the fourth, or the fifth, as the on-lookers may dictate: the Sea-Lion thereupon makes no attempt to catch the member of the series thus verbally indicated. It is only a day or two ago, however, that I witnessed this performance, and as yet I am not satisfied that the Sea-Lion really "counts," because it appears to me probable that the keeper may unintentionally make some slight difference in his manner of throwing the piece of fish which he expects the Sea-Lion to miss, and that it is really this slight difference in the manner of throwing which the seal perceives and acts upon. Therefore, I intend to get an arrangement fitted up whereby the pieces of fish shall be thrown mechanically. But, whatever the result of this experiment may be, I think there can now no longer be any question that it lies within the capacity of animal intelligence to "count" correctly (in the sense already explained) as far as five, and even to show a well-marked appreciation—although progressively a more and more uncertain one—of numbers lying between five and ten.

The only other direction in which I have thus far subjected the Chimpanzee to psychological experiment has been in that of attempting to teach her the names of colours. It appeared to me that if I could once succeed in getting her thoroughly well to know the names of black, white, red, green, or blue, a possible basis might have been laid for many further experiments wherein these five colours could have been used as signs of artificially associated ideas. The result, however, of attempting to teach her the names of colours has been so uniformly negative, that I am disposed to think the animal must be colour-blind. It is perhaps desirable to state the facts which have led me to entertain this their most probable interpretation.

The method adopted in these experiments was to obtain from the importers of oriental matting a number of brightly and uniformly coloured pieces of straw—each piece being either white, black, red, green, or blue. Offered the straws two by two of different colours on each occasion, the ape was invited to select the straw of the colour named from the one whose colour was not named, and, of course, on choosing correctly was rewarded with a piece of fruit. In this way she quickly learnt to distinguish between the white straws and the straws of any other colour; but she never could be taught to go further. Now the distinction between the white straws and the straws of any other colour is a distinction which can be drawn by an eye that is colour-blind; and from the fact that

¹ Fac. Ment. des Anim. tom. ii. p. 207.

Monticelli. del.
Berjeau & Highley del.

Imp. Camb. Sci. Inst. Co.

NEW OR RARE ENTOZOA.

the ape is always able to perceive this distinction (she will search long and patiently for a straw of any colour when told that it occurs somewhere in the general litter of white straws constituting her bed, and eventually pick it out), while she cannot be taught to distinguish any of the others, I conclude that her failure in this respect is not due to any want of intelligence, but to some deficiency in her powers of colour-perception.

2. Notes on some Entozoa in the Collection of the British Museum. By FR. SAV. MONTICELLI¹.

[Received May 18, 1889.]

(Plate XXXIII.)

Thanks to the courtesy of Dr. A. Günther I have been able to examine the helminthological collection of the British Museum (N.H.), and to study closely the typical specimens of von Siebold and Baird which are contained therein. On the present occasion I shall merely make some remarks upon a few of the more interesting new species or such as are not well known. Other observations I hope to embody in a larger forthcoming paper.

TREMATODA.

1. AMPHISTOMUM TRUNCATUM, Rud. Ent. Syst. pp. 91 et 389.

I have found many specimens of this species taken from the intestine of a *Phoca vitulina*. My observations enable me to complete the description as follows:—Body elliptical, compressed or cylindrical, according to the state of preservation, with posterior extremity obtusely truncated and covered by fine spines, which in the anterior third are large, become gradually smaller in the middle third, and invisible in the posterior third.

Posterior sucker large, rounded, very prominent; pharynx of moderate size; œsophagus short; intestinal cæca long. The genital antrum placed in the anterior part of the body and surrounded by an elevated edge; it resembles a sucker; testes large and occupying the posterior part of the body; ovarium small, and uterus not much extended. Vitellaria disposed laterally and limited to the middle part of the body; vagina opening dorsally.

2. DISTOMUM VELIPORUM, Creplin, in Wiegmann's Archiv, 1842, p. 336, tab. ix.

There are in the collection specimens of this species found in the stomach (α) of an *Acanthias* (*vulgaris*?) presented by Dr. Chapman, (β) of a *Scymnus*, sp., from Madeira, (γ) of a *Torpedo fairchildi* from Dunedin (New Zealand), presented by the Otago University Museum; and in the body-cavity of a *Raja nasuta* from Dunedin (New Zealand). The *Acanthias*, *Torpedo fairchildi*, and *Raja nasuta* are new hosts

¹ Communicated by Dr. A. Günther, V.P.Z.S.

for this *Distomum*, which up to now has been found in the stomach only.

D. microcephalum, Baird (Cat. Ent. Brit. Mus. p. 98, pl. ii. fig. 2), from the stomach of *Acanthias vulgaris*, is, I think, based on small specimens of *D. veliporum*.

3. *DISTOMUM MICROPORUM*, sp. n. (Plate XXXIII. fig. 1.)

Body elongated, pyriform, of a yellow colour, finely plicated transversely, with a small caudal appendage; in front very narrow and cylindrical, behind gradually enlarged and swollen; posterior extremity obtusely lanceolate. Anterior sucker large, circular, sub-terminal, situated entirely on the ventral surface; posterior sucker smaller than the anterior, circular, placed at the commencement of the posterior enlargement of the body. The small genital antrum is placed almost immediately behind the anterior sucker. Penis of moderate size, enlarged at the base. Excretory system opening at the extremity of body subdorsally. Lengths of the specimens 20–32 millim.

The six specimens of this new species were taken by Dr. Günther from a *Plagyodus ferox* from Madeira. Trematoda have not been previously observed in the *Plagyodontina*.

4. *DISTOMUM GIGAS*, Nardo, Mem. sopra alcune nuove e rare specie di Entozoi, in Heusinger's Zeitsch. f. org. Physik, 1827, p. 68. (Plate XXXIII. figs. 2, 3.)

I give a figure of this rare species, which, so far as I know, has not yet been figured. The only specimen existing in the collection was taken from the stomach of an *Ausonia cuvieri* which was found on the British coast.

5. *DISTOMUM HALOSAURI*, Jeffrey Bell, Ann. & Mag. Nat. Hist. (5) xix. pp. 116–117. (Plate XXXIII. figs. 4, 5.)

Mr. Bell has described this species, found in the enlarged ends of the ureters of a *Halosaurus macrochir* dredged off Cape St. Vincent. I give a figure of this interesting species, and I add some remarks to Bell's description.

Anterior sucker small, globose, situated ventrally, presenting in front a pointed elevation, which, observed in a microscopical preparation, seems to be pierced by a cavity (see fig. 5). Posterior sucker as large or hardly larger than the anterior, circular, enlarged, prominent. Pharynx enclosed in the anterior sucker; œsophagus slender; intestinal cæca not very long. Testes in irregular outline; ovarium before the testes; uterus much extended through the body; genital antrum placed immediately before the posterior sucker.

Entozoa have not been before discovered in *Halosaurus*.

6. *DIDYMOZON SERRANI*, sp. n. (Plate XXXIII. fig. 6.)

This new species was found on the gills of a *Serranus fimbriatus* from Madeira; the same undescribed species I have frequently found attached to the gills of the *Serranus gigas* of the Gulf of Naples.

At present I give only a figure of this new species to ensure its recognition. The detailed description, with anatomical remarks, will be given in a forthcoming paper. The lengths of the cysts of this new species are 6–10 millim.

Didymozoon serrani is the first species of this genus found in a fish of the family Percidæ, the other known species inhabiting fishes of the families Scombridæ and Sphyrænidæ.

CESTODA.

7. GYROCOTYLE RUGOSA, Diesing, Syst. Helm. vol. i. p. 480.

A specimen taken from the intestine of a *Callorhynchus antarcticus* from Dunedin (New Zealand). This very strange Cestode has hitherto been found only in *Macra edulis*.

8. BOTHRIOCEPHALUS MACROBOTHRIUM, sp. n. (Plate XXXIII. figs. 7, 8, 9.)

Head small, with the terminal cupula flattened; bothria lateral, small, prominent, with thick margin; neck very short, subcylindrical; body flattened. Anterior segments very small, hardly to be distinguished, becoming gradually more distinct towards the end of the body. The last segments not different in form from the preceding, but a little larger. Genital orifices lateral and in the anterior part of the segments.

Length of the specimens 16–20 centim.

The specimens were taken from the stomach of a *Trachypterus*, sp. inc., from Mauritius, presented by L. Bouton, Esq.

9. BOTHRIOCEPHALUS PLATYCEPHALUS, sp. n. (Plate XXXIII. fig. 10.)

Head pointed, triangular, pyramidal, anteriorly truncated, without distinct terminal cupula. Bothria large, much flattened, with indistinct fossette; neck very short, quadrangular; body flattened. Anterior segments small, the succeeding gradually larger; posterior margin arcuate; genital orifices lateral. Lengths of specimens 115–190 millim.

The host of this new species is *Beryx decadactyla* of Madeira, from which Entozoa have not been previously described.

10. BOTHRIOCEPHALUS TETRAPTERUS, von Siebold, in Lehrbuch d. vergl. Anat. d. wirb. Thiere, Berlin, 1848, pp. 120, 143, 147, in notes. (Plate XXXIII. fig. 11.)

I complete Siebold's description of this species, which inhabits *Phoca vitulina*:—Head cordiform. Bothria lateral, enlarged, with margins expanded, so as to resemble four wings. Anterior segments trapezoidal, distinctly campanulate; the following rectangular, not campanulate, the later decidedly quadrate. I have not observed the incomplete transverse division of the segments described by Siebold. The male and female generative organs are double in each segment, with two distinct genital orifices, very small, situated

in the anterior third of the proglottis; exceptionally they are single, with a single genital orifice.

Length of complete specimen existing in the collection 55 millim.

11. *TETRABOTHRIUM MACROCEPHALUM*, Rudolphi, Ent. Hist. pt. iii. p. 61.

Tænia suliceps, described and figured by Baird (P. Z. S. 1859, p. 111, pl. lvi. figs. 1, 1a, 1b) from the intestine of *Diomedea exulans*, is only a specimen of this species of Rudolphi, which had not previously been found in *Diomedea*.

Again, the *Tænia diomedea*, n. sp. (?), described recently by Linstow ('Challenger' Report, Entozoa, p. 13) from *Diomedea brachyura*, is a specimen of *Tetrabothrium macrocephalum*, and probably the *Tetrabothrium torulosum* described by the same author from *Diomedea brachyura* is only a synonym of the same worm.

12. *PHYLLOBOTHRIUM CRISPATISSIMUM*, sp. n. (Plate XXXIII. fig. 12.)

Very closely allied to *P. lactuca* and *P. tridax*, from which it may be easily distinguished by the larger head, the smaller bothria (which are extremely plicated with very small accessory suckers), by the broad and short neck, and by the very small size of the segments of the body, only gradually enlarged near the extremity of the body; the last segments are rectangular; genital orifices marginal.

Lengths of the specimens 140–190 millim. Unfortunately the host of this new species is unknown.

PELICHNIBOTHRIUM, gen. nov.

Head with a large pyramidal haustellum, anteriorly truncated and provided with a well-developed terminal sucker; bothria four, enlarged, like a basin, completely adherent to the head, each with an accessory sucker, scrobiculiform, and disposed in couples on each side of the head. The bothria of each couple are very near together.

13. *PELICHNIBOTHRIUM SPECIOSUM*, sp. n. (Plate XXXIII. figs. 13, 14.)

There are many specimens taken from *Alepidosaurus ferox*, from Madeira. I was unable to discover true segments of the body or the generative organs.

14. *TÆNIA FALCIFORMIS*, Baird, Cat. Entoz. Brit. Mus. p. 116; P. Z. S. 1853, p. 24, pl. xxx. fig. 3. (Plate XXXIII. fig. 17.)

Baird described the rostellum of this *Tænia* as unarmed, but with a mark of doubt. I have observed that the rostellum, elongated, conical, and anteriorly subrounded, is armed with eight very slender and long hooks of a very characteristic form; the neck is indistinct; the genital orifices are marginal.

15. *TÆNIA CALVA*, Baird, Cat. Ent. p. 83; P. Z. S. 1853, p. 24, pl. xxxi. figs. 1, 1a. (Plate XXXIII. figs. 18, 19.)

There are in the collection numerous specimens of this species

found in the intestine of *Lagopus scoticus*. The small rounded head hardly distinct from the long neck, provided with four circular and large suckers, has the rostellum armed with a small crown of very numerous and minute hooks (Baird said the rostellum was unarmed). The genital orifices are marginal, on one side. The ova are small, ovoidal; contents a very small embryo, occupying about the fiftieth part of the total contents of the ova.

16. *TÆNIA MAGELLANICA*, sp. n. (Plate XXXIII. figs. 15, 16.)

I propose this name for a species of *Tænia* collected in Magellan Straits by Dr. Cunningham. This species, of a brown colour, 20–28 millim. in length, is thus characterized:—Head subclavate, rostellum not apparent; suckers large, as wide as the head; neck delicate, of moderate length. Anterior part of the body thin, posterior gradually enlarged; anterior segments small, following rectangular, the last trapezoidal. Genital orifices lateral, very small, and not easy to recognize.

17. *TÆNIA BIFARIA*, von Siebold, MSS. ? (Baird, Cat. Ent. p. 79).

This interesting species has been, so far I know, not yet described. It is characterized as follows:—Head small, triangular, with a conical, pointed, unarmed rostellum and a very small sucker; neck short. Anterior segments small, narrow, gradually enlarged and rectangular, last segments subquadrate. The generative organs are duplicated in each segment, with the genital orifices, which are lateral and prominent, on either side. The penis-sheath is large; the penis of moderate size, armed with fine spines.

Lengths of the specimens taken from the intestine of *Nyroca leucophthalma* 39–90 millim.

EXPLANATION OF PLATE XXXIII.

- Fig. 1. *Distomum microporum*, sp. n., nat. size, p. 322.
 2. — *gigas*, nat. size, p. 322.
 3. — —, posterior sucker, $\times 3$, p. 322.
 4. — *halosauri*, $\times 3$, p. 322.
 5. — —, anterior part of the body; from a microscopical preparation, p. 322.
 6. *Didymozoon serrani*, sp. n., nat. size: attached to the gills of *Serranus fimbriatus*, p. 322.
 7. *Bothriocephalus macrobothrium*, sp. n., head, $\times 6$, lateral view, p. 323.
 8. — —, head, $\times 6$, anterior view, p. 323.
 9. — —, last segments, $\times 3$, p. 323.
 10. — *platycephalus*, sp. n., head, magnified, p. 323.
 11. — *tetrapterus*, head, magnified, p. 323.
 12. *Phyllobothrium crispatisimum*, sp. n., head, magnified, p. 324.
 13. *Pelichnibothrium speciosum*, g. et sp. n., head, $\times 6$, p. 324.
 14. — —, head from a microscopical preparation, p. 324.
 15. *Tænia magellanica*, sp. n., head, magnified, p. 325.
 16. — —, last segments, p. 325.
 17. — *falciformis*, a hook, magnified, p. 324.
 18. — *calva*, ova, much magnified, p. 324.
 19. — —, a hook, much magnified, p. 324.

3. List of Birds collected by Mr. Ramage in Dominica, West Indies. By P. L. SCLATER, M.A., Ph.D., F.R.S., Secretary to the Society.

[Received May 13, 1889.]

I lay on the table a set of the birds collected, in 1887 and 1888, in the island of Dominica, West Indies, by Mr. George A. Ramage, the Naturalist employed by the joint Committee of the Royal Society and British Association for the investigation of the Fauna and Flora of the Lesser Antilles.

The specimens are 116 in number, and belong to the following 30 species :—

*1. <i>Mimocichla ardesiaca</i> (Vieill.).	16. <i>Blacicus brunneicapillus</i> , Lawr.
2. <i>Myiadestes dominicanus</i> , Stejn.	17. <i>Tyrannus rostratus</i> , Schl.
3. <i>Margarops montanus</i> (Vieill.).	18. <i>Eulampis jugularis</i> (Linn.).
4. <i>Oncocerthia ruficauda</i> , Gould.	19. <i>Eulampis holosericeus</i> (Linn.).
5. <i>Thryothorus rufescens</i> , Lawr.	20. <i>Thalurenia wagleri</i> (Less.).
6. <i>Dendroica melanoptera</i> , Sharpe.	21. <i>Orthorhynchus exilis</i> (Gm.).
7. <i>Dendroica plumbea</i> , Lawr.	22. <i>Coccyzus minor</i> (Gm.).
8. <i>Setophaga ruticilla</i> (Linn.).	23. <i>Chrysotis bouqueti</i> (Wagl.).
9. <i>Vireosylva calidris</i> (Linn.).	24. <i>Chrysotis augusta</i> , Vigors.
10. <i>Certhiola dominicana</i> , Taylor.	25. <i>Buteo pennsylvanicus</i> (Wils.).
11. <i>Saltator guadelupensis</i> , Lafr.	26. <i>Tinnunculus caribbeorum</i> (Gm.).
12. <i>Loxigilla noctis</i> (Linn.).	27. <i>Zenaida martinicana</i> , Bp.
13. <i>Phonipara bicolor</i> (Linn.).	28. <i>Chamaepelia passerina</i> (Linn.).
14. <i>Elainea martinica</i> (Linn.).	29. <i>Butorides virescens</i> (Linn.).
15. <i>Myiarchus tyrannulus</i> (Müller).	*30. <i>Nyctiardea violacea</i> (Linn.).

The most complete list of the birds of Dominica is that published by Mr. G. N. Lawrence in 1878¹. It contains the names (or synonyms of the names) of all the above-mentioned species except two, namely *Mimocichla ardesiaca* and *Nyctiardea violacea*. As regards the latter of these, the species is of wide distribution, and is known to occur in others of the Lesser Antilles²; there is no reason therefore to remark on its being found also in Dominica. But *Mimocichla* is, I believe, quite a novelty in the Avifauna of the Caribbean group of islands. This genus contains four species, and has hitherto been supposed to be restricted to the Greater Antilles, *M. rubripes* and *M. schistacea* being its representatives in Cuba, *M. plumbea* in the Bahamas, and *M. ardesiaca* in San Domingo and Porto Rico. As might have been expected, the Dominican *Mimocichla* belongs to the Porto Rican form. It is, in fact, so nearly similar that I do not see sufficient grounds for making it specifically distinct. The only difference apparent is the much greater whiteness of the belly in the Dominican specimens, whence those who adopt trinomials would, no doubt, call it *Mimocichla ardesiaca albiventris*. Mr. Ramage has sent home two male examples of this bird, which were both procured at "Batalie, dry region to leeward," in March 1889.

¹ "Catalogue of the Birds of Dominica from collections made for the Smithsonian Institution by Fred. A. Ober," Proc. U. S. N. M. 1878, p. 48.

² See Cory, Birds of the West Indies (1880), p. 249.

The known species of birds of the island of Dominica are about 60 in number, of which about 35 are Passeres, Picariæ, and Psittaci. Of these five appear to be absolutely restricted to the island :—

Blacicus brunneicapillus.

Thalurania wagleri.

Chætura dominica.

Chrysotis augusta.

— *bouqueti.*

Besides these there are two peculiar subspecies, namely *Mimocichla ardesiaca albiventris* and *Margarops montanus rufus*. The great feature in the Dominican Ornis is the sole possession of two species of a peculiar group of large Parrots of the genus *Chrysotis* which is restricted to the Lesser Antilles, namely *C. augusta* and *C. bouqueti*. Of the other two known members of this group, St. Vincent has one (*C. guildingi*) and Santa Lucia one (*C. versicolor*). There ought to be a representative of this group also in Martinique, but it is not yet known to us. It is perhaps extinct. Besides the species and subspecies restricted solely to Dominica, this island has many other peculiar forms in common with its near neighbours of the Lesser Antilles. These will be found enumerated in Mr. Lawrence's instructive index and analysis of the birds contained in Mr. Ober's collections (Proc. U. S. N. Mus. 1878, p. 486), and in Cory's 'Birds of the West Indies.'

June 18, 1889.

Prof. Flower, C.B., LL.D., F.R.S., President, in the Chair.

The Secretary exhibited, on behalf of Mr. J. F. Green, F.Z.S., a very fine example of the Common Eel (*Anguilla vulgaris*) obtained from a pond at Lee, Kent, as mentioned in 'The Field' of August 25th, 1888.

Mr. B. B. Woodward exhibited and made remarks upon a drawing of *Ærope caffra*, a carnivorous Snail from the Cape Colony, taken from an example lately living in this country.

Mr. B. B. Woodward also exhibited an example of a fossil shell from the Eocene of the Paris Basin, *Neritina schmideliana*, and a section showing its peculiar mode of growth.

Mr. Eadweard Muybridge exhibited a number of projections with the Oxy-hydrogen Lantern. These had been selected from his elaborate work on Animal Locomotion now being prepared for publication under the auspices of the University of Pennsylvania, and illustrated successive phases of motion, such as occur during a single stride of the walk, amble, trot, gallop, &c., of Horses, Dogs, Elephants, and other animals, both wild and domestic, and of birds while flying.