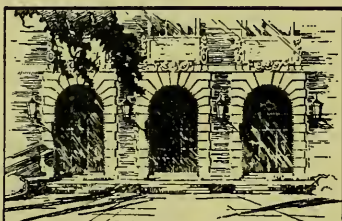


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OCTOBER 1898.]

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PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.



110TH SESSION.

FROM NOVEMBER 1897 TO JUNE 1898.

LONDON:

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# PROCEEDINGS

OF THE

## LINNEAN SOCIETY OF LONDON.

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(ONE HUNDRED AND TENTH SESSION, 1897-98.)

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November 4th, 1897.

Dr. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Messrs. Frank Tufnail and John Stewart Remington were elected Fellows of the Society.

Mr. F. G. Jackson, leader of the Jackson-Harmsworth Polar Expedition, exhibited a series of lantern-slides, illustrating some zoological observations of the Expedition, the most noteworthy being views of the hibernaculum of the Polar Bear and of the breeding haunts in Franz Josef Land of the Ivory Gull (*Pagophila eburnea*), the eggs of which were also shown.

A discussion followed, in which Messrs. Harting, H. Saunders, H. O. Forbes, H. J. Elwes, A. Trevor-Battye, the Rev. F. A. Walker, and Dr. Murie took part.

Mr. H. Fisher, Botanist to the Expedition, brought for exhibition a collection of Plants made by him in Franz Josef Land, the consideration of which was deferred for want of time.

Mr. Reginald Lodge exhibited some lantern-slides of Marsh Birds, their nests, eggs, and young, from photographs recently taken in Spain and Holland.

The following papers were read:—

1. "On the Attraction of Flowers for Insects." By the Right Hon. Sir John Lubbock, Bart., F.R.S., F.L.S.

2. "On the Origin of Transfusion-tissue in the Leaves of Gymnospermous Plants." By W. C. Worsdell. (Communicated by Dr. Dukinfield H. Scott, F.R.S., F.L.S.)

November 18th, 1897.

Dr. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Messrs. Daniel Angel Jones, Peter Goiffon, and Edward Russell Budden were admitted Fellows of the Society.

The President announced that since the close of last Session they had been so fortunate as to receive from Prof. G. J. Allman, a former President of the Society, a portrait of himself painted by Miss Busk, whose portrait of her late father was now hanging near it. It was an excellent likeness, and he was sure it would be highly valued. He moved that a vote of thanks be recorded for the presentation, and this was unanimously agreed to.

Mr. Alan F. Crossman, F.L.S., exhibited photographs of a fasciated Lily (*Lilium auratum*), on which some remarks were made by Mr. A. D. Michael, F.L.S.

Mr. R. Morton Middleton, F.L.S., exhibited and made remarks on some Ants received from Ephesus. These had been referred to in a previous communication as being made use of in Asia Minor for the purpose of holding together the edges of incised wounds by means of their strongly hooked and sharp mandibles (Journ. Linn. Soc., Zool. vol. xxv. p. 405). The species was now identified as *Cataglyphus viatica*, Fabr. Mr. Thomas Christy, F.L.S., gave some additional information resulting from inquiries he had made of foreign correspondents.

Mr. J. E. Harting, F.L.S., exhibited a specimen of the Great Black Woodpecker (*Picus martius*) lately received from Col. W. C. Dawson of Weston Hall, Otley, Yorkshire, where it had been shot in his presence by a friend on the 8th Sept. last. It was shown that this could not be the bird which had recently been lost from the Zoological Gardens, since the latter did not escape until Oct. 9th. Allusion was made to the numerous records of the occurrence of this species in England, some of which at least seemed worthy of credence, since the recorded specimens had been obtained by, and were preserved in the possession of trustworthy persons.

Mr. Howard Saunders expressed the opinion that there was no sufficient ground for including *Picus martius* in the list of British birds, as from its partiality for pine forests and its stationary habits, it was not likely to be a voluntary visitor to this country.—The President remarked that the perfect state of plumage of the specimen exhibited was satisfactory evidence of its not having recently escaped from captivity; and that the late Lord Lilford, the year before his death (which occurred on

the 17th June, 1896), had two Black Woodpeckers in his aviary in Northamptonshire, and in consequence of their ailing in health, had given them their liberty. It seemed possible that one of these might be the bird lately shot in Yorkshire.

Mr. J. E. Harting also exhibited in the flesh a hybrid Pheasant and Black Grouse, which had been received that day from Shropshire. In appearance it precisely resembled a similar hybrid of which a coloured figure is given in early editions of White's 'Selborne.'

On behalf of Mr. Leonard Lush, of Stonehouse, Gloucestershire, three white Partridges (*Perdix cinerea*) were exhibited, which had been shot by him on the Berwyn Mountains in Wales, early in October last. It was remarkable that in the covey, which consisted of nine birds, no less than five of them were white, four only being of the normal colour.

Mr. Hamilton Leigh, F.L.S., exhibited the skull of a Red Deer recently shot by him in Scotland, in which there was a singular distortion of the pedicel, resulting from an ancient fracture of the left temporal bone.

The following papers were read:—

1. "On *Pontobolbos manaarensis*." By Prof. Arthur Dendy, F.L.S.
2. "On *Haddonina*, a new genus of Foraminifera." By Frederick Chapman, A.L.S.

December 2nd, 1897.

DR. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Messrs. John Stewart Remington, Albert Henry Pawson, and George Creswell Turner were admitted; and Messrs. John Donnell Smith, Thomas Jeffery Parker, Walter Wilson Froggatt, Henry William Marett Sims, William John Hume McCorquodale, José de Campos Novaes, and Alberto Löfgren were elected Fellows of the Society.

Prof. J. B. Farmer, F.L.S., exhibited specimens of *Cecidomyia strobiloides*, which he collected in August last at Ithaca, N.Y., and made remarks upon its cone-like galls which were found on Willows.

Mr. M. F. Woodward exhibited and made remarks upon an egg of *Echidna* taken from the mammary pouch of the parent at Coorinja, W. Australia, by Mr. B. H. Woodward, Curator of the Perth Museum.

The following papers were read:—

1. "On the Anatomy of *Caudina coriacea*." By Prof. Arthur Dendy, F.L.S.
2. "On Protective Coloration in *Mus musculus*." By Mr. H. L. Jameson. (Communicated by Prof. G. B. Howes, Sec.L.S.)
3. "On some Desmids from the United States." By Messrs. W. West, F.L.S., and G. S. West.

December 16th, 1897.

Mr. FRANK CRISP, LL.B., Vice-President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. W. J. H. McCorquodale was admitted a Fellow of the Society; and Messrs. Alfred Fryer and George Charles Champion were elected Associates.

Mr. W. Carruthers, F.R.S., exhibited and made remarks upon a Fungus, *Rosellinia ligniaria*, Nitschke, which had been found to attack living ash-trees, eventually causing the death of the tree. Additional observations were made by Mr. George Murray and Prof. Farmer.

Mr. Edward Step, F.L.S., exhibited two specimens of a Hermit Crab, *Eupagurus Prideauxi*, from Portscatho, Cornwall. Both were found naked and in rock-cavities, and special interest attached to the fact that, in the absence of the well-known Molluscan shell which the species affects, each specimen was incrustated at precisely the same regions of its exterior by "acorn-shells."

The Rev. T. R. R. Stebbing, F.L.S., gave an account of the habits of this and other species of the genus *Eupagurus*, directing special attention to the work of Aurivillius; and Prof. Howes remarked that it was on record that in the absence of a shell the bowl of a clay-pipe did not come amiss to these animals, and that they will readily utilize broken test-tubes.

The following papers were read:—

1. "On the Affinities of the Madreporarian genus *Alveopora*." By H. M. Bernard, F.L.S.
2. "On some Characeæ collected in the West Indies by Mr. T. B. Blow, F.L.S." By Messrs. H. and J. Groves, F.L.S.

Mr. B. Daydon Jackson referred to a correspondence which had taken place between the first President of the Society, Sir J. E. Smith, and Dr. Peter Camper, at a time when it was proposed to elect the latter a Foreign Member, an honour which for curious reasons he declined. (See Appendix, pp. 55-57.)

January 20th, 1898.

Dr. ST. GEORGE MIVART, F.R.S., Vice-President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Messrs. Albert William Brown, Wilson Crosfield Worsdell, and Wickham Flower were elected Fellows of the Society.

Mr. J. E. Harting, F.L.S., exhibited a series of photographs of the Grey Seal (*Halichærus grypus*) at various ages, taken from life by Mr. Henry Evans, of Jura, on the Haskeir Rock, Outer Hebrides, to which place the animal resorts every autumn for breeding purposes. Some of the photographs showed the young thickly clothed with white hair, which is retained for several weeks after birth, but is gradually shed before the animal enters the water. Details of measurement and weight were given, and occasion was taken to review the status of the Grey Seal as a British species, and to indicate its known breeding-stations in the British Islands.

Mr. W. J. H. McCorquodale, F.L.S., exhibited a skull of a Hartebeeste which was one among some 50 skulls of various ruminants he had recently received, all having their horns invested by the larvæ of *Tinea vastella*, upon the chrysalids of which he offered some remarks. The collection was from Nigeria, and was made by his brother the late Lieut. R. H. McCorquodale, 3rd Dragoon Guards, while doing duty as a special service officer in W. Africa. He further recorded the capture by his brother, in 1896, of a Giraffe from the regions of the Benue River, north of Calabar, remarking that the specimen was the only one known from this region of Africa, and that its skull was now deposited in our National Collection. He added that through the kindness of his friend Major A. E. Festing, now in command of the Niger Company's troops, he was expectant of further collections of specimens of all possible classes of animals, with localities accurately recorded.

Mr. W. E. De Winton, who was present as a visitor, made some remarks on the geographical distribution of the Giraffe in Africa, and traced the limits of the range of the Northern and Southern species as far as had been ascertained.

The following papers were read:—

1. "On the Larval Hyobranchial Skeleton of the Anurous Batrachians, with special reference to the Axial Parts." By W. G. Ridewood, D.Sc., F.L.S.

2. "On the 'Porus genitalis' in the *Myxinidæ*." By R. H. Burne, B.A. (Communicated by Prof. Howes, Sec. L.S.)

February 3rd, 1898.

DR. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Messrs. Wilson Crosfield Worsdell and Wickham Flower were admitted, and Professor Thomas William Bridge was elected a Fellow of the Society.

Prof. Stewart, F.R.S., F.L.S., exhibited (1) specimens illustrative of the articulation between the upper and lower jaw of a Skate, *Raia batis*, Linn., upon which remarks were made by Prof. Howes and Mr. Holt; and (2) drawings of *Puccinia graminis*, showing the form of the teleutospores and æcidiospores, upon which some observations were made by Dr. D. H. Scott, F.R.S., confirmatory of the exhibitor's views.

Mr. Thomas Christy, F.L.S., exhibited a portion of an iron chain through the links of which a Virginian Creeper, *Vitis hederacea*, Ehrh., had grown and had become naturally intertwined.

The following papers were read:—

1. "On the Muscular Attachment of the Animal to its Shell in some Fossil Cephalopoda (Ammonoidea)." By G. C. Crick, F.G.S., F.Z.S. (Communicated by the President.)
2. "On the Comparative Anatomy of certain Genera of the Cycadaceæ." By W. C. Worsdell, F.L.S.

February 17th, 1898.

DR. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Dr. Kakichi Mitsukuri, Professor of Zoology, Imperial University, Tokyo, was admitted a Foreign Member of the Society.

Prof. G. B. Howes, F.R.S., exhibited specimens of Dog-fishes—(1) *Scyllium canicula* from the egg-case, and (2) *Scyllium catulus* prematurely hatched, which he had received from his friend and former pupil Mr. E. W. L. Holt, of the Marine Biological Laboratory at Plymouth. The specimens showed the dorso-lateral and caudal placoids which led Filippi to propose the species *Scyllium acanthotum*, shown by Dr. Günther to be based upon a developmental character, and had in recent years been the subject of some interesting speculations by Paul Meyer. For comparison he exhibited also an embryo from the purse of *Callorhynchus antarcticus*, showing a similar set of organs, and gave reasons for surmising that they are not merely transitory

vestiges but of service to the animal while encapsulated within its egg-case.

Some additional remarks were made by the President.

Mr. J. E. Harting, F.L.S., exhibited a nearly white variety of *Mus rattus* recently obtained in Carnarvonshire, and made some remarks on the difference of haunts and habits in the two species *M. rattus* and *M. decumanus*, and on their usual antagonism. In reply to Mr. H. J. Elwes on the question of occasional hybridism, he stated that no well-established case of the kind had been recorded, although some years ago Mr. Barrett Hamilton had described (*Zoologist*, 1883, p. 141) a suspected hybrid which was partly brown in colour, partly black, and exhibited some other intermediate characters. He referred to the so-called Irish rat, *Mus hibernicus* of Thompson, which was now regarded as a permanent black variety of *Mus decumanus* not confined to Ireland.

The following papers were read:—

1. "A Revision of the Genus *Arenaria*." By F. N. Williams, F.L.S.

2. "On the Histology of the Salivary, Buccal, and Harderian Glands of the *Colubridæ*, with Notes on their Tooth-succession and the Relationships of the Poison-duct." By G. S. West, A.R.C.S. (Communicated by Prof. Howes, Sec. L.S.)

March 3rd, 1898.

Dr. St. GEORGE MIVART, F.R.S., Vice-President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. Frank Tufnail was admitted, and Dr. Charles Symes and Prof. Arthur Mead Edwards were elected Fellows of the Society.

Mr. Thomas Christy, F.L.S., exhibited specimens of the Mora Nut of British Guiana (*Dimorphandra Mora*, Schomb.), of which some had been lately introduced into London by Colonial brokers as the Kola Nut (*Cola acuminata*). It appeared, however, on analysis that the former contains no Caffeine, a product for which the latter is of definite commercial value. It remained to be ascertained whether the Mora Nut has any economic value.

The following papers were read:—

1. "Observations on the Structure and Morphology of the Cranial Nerves and Lateral Sense-organs of Fishes, with special reference to the Genus *Gadus*." By Frank J. Cole. (Communicated by Prof. W. A. Herdman, F.R.S., F.L.S.)

2. "On the Occurrence of *Carex helvola* in Britain." By George Claridge Druce, F.L.S.

3. "On some Arctic Spiders collected in Franz Josef Land during the Jackson-Harmsworth Polar Expedition." By the Rev. O. P. Cambridge. (Communicated by A. D. Michael, F.L.S.)

March 17th, 1898.

Dr. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. Edward A. Fitzgerald was elected a Fellow of the Society.

Mr. J. E. Harting, F.L.S., exhibited an egg of the Great Auk (*Alca impennis*) which had just been discovered after having been lost sight of for more than five-and-twenty years. He explained that the second Lord Garvagh, who died in 1871, was the possessor of three eggs of this bird, two of which he had purchased of Mr. T. H. Potts at Stevens's Sale Rooms in May 1853, and the third he had acquired at the sale of Dr. N. Troughton's collection in April 1869. After the death of Lord Garvagh, his executors disposed of the two eggs from Potts to the late Mr. G. Dawson Rowley, and they are now in the possession of his son. The Troughton egg, which was reported to have been broken to pieces through the carelessness of a servant, was merely cracked, and, having been put aside by the widowed Lady Garvagh, was lost sight of until the present week, when, on the death of her daughter who was her residuary legatee, it became necessary for the executor, Mr. James Powell, to make an inventory of the personal effects, and the egg exhibited was discovered by Mr. Harting when examining what remained of the collection, long forgotten and stowed away in a dusty attic.

Mr. Edward Bidwell exhibited photographs of the two eggs of the Great Auk acquired from T. H. Potts, and a water-colour sketch of the Troughton egg made in 1861 before it became the property of Lord Garvagh. This sketch placed its identity beyond doubt. He remarked that the egg had been in Dr. Troughton's collection for 17 years, he having acquired it in 1852 from the late A. D. Bartlett, who had then recently received it back from Mr. Maunde, to whom he had previously sold it in 1842.

Mr. Howard Saunders, F.L.S., made some remarks on the N.W. limits of the area formerly inhabited by the Great Auk.

Mr. Carruthers, F.R.S., recalled his acquaintance with Dr. John Fleming of Edinburgh, who died in 1857, and who in 1821 was in temporary possession of a living Great Auk. This bird was allowed to swim in the sea with a cord attached to one leg, and through this indulgence eventually contrived to escape. Before another 25 years elapsed the species had become extinct.

The following papers were read:—

1. "On *Limnocarpus*, a new genus of Fossil Plants from the Tertiary deposits of Hampshire." By Clement Reid, F.L.S.

2. Natural Selection the cause of Mimetic Resemblance and Common Warning Colours." By Prof. E. B. Poulton, F.R.S., F.L.S.



April 7th, 1898.

Dr. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Dr. H. Marett Tims was admitted; and the following were elected Fellows of the Society: Messrs. Alfred James Ewart, William George Freeman, Ernest Charles Horrell, Charles Edward Jones, and Richard Frank Rand.

Mr. J. E. Harting, F.L.S., exhibited specimens of the Asiatic Partridge, *Perdix daurica*, of which a large consignment had been lately received in London. The species was described from the Altai and Dauria so long ago as 1811 by Pallas (Zoogr. Ross.-Asiatica), who regarded it as a variety of *Perdix cinerea*. It was re-described in 1863, by Verreaux and Des Murs (Proc. Zool. Soc. 1863, p. 62, pl. 9), from specimens procured by Taczanowski in Central Dauria, and was named by them *Perdix barbata* from the peculiarly elongated feathers of the chin, an excellent coloured figure of the bird by Joseph Wolf accompanying their description. According to Swinhoe this bird is brought in numbers in a frozen state to the Pekin market, in winter, by the Mongolians who snare them; and it seemed not unlikely that those received in London had been forwarded by Russian agents *viâ* St. Petersburg, or perhaps from Irkutsk north of the Mongolian territory, which is the true home of the species.

Mr. W. E. De Winton, who brought another specimen of this bird for exhibition, made some remarks on the geographical distribution of the species, and expressed the opinion that it had been improperly described by certain writers as Manchurian, its true *habitat* lying to the west of the Khingan Mts. in Mongolia.

The President observed that the market price of this Partridge in London (half-a-crown per brace) could hardly pay the cost of so long a transport, although he thought it more likely that the birds had reached St. Peterburg from Irkutsk at the southern end of Lake Baikal, rather than from Pekin.

Mr. J. E. Harting also exhibited the skin and skull of a Wild Cat, *Felis catus*, recently obtained near Speanbridge, in Inverness-shire. He pointed out the present restricted range of the animal, which had not only disappeared entirely from England and Wales, but was no longer to be found in Scotland south of a line drawn from Obau to Ben Lui, along the southern and eastern boundary of Perthshire, and thence northward to Nairn. He explained the cause of reversion in the colour of emancipated house-cats to the wild type of *Felis catus*, and referred to the skulls of cats which had been exhumed on the site of the Roman city of Silchester, which he thought disproved the view of the late Prof. Rolleston (Journ. Anat. and Physiol.) to the effect that the domestic cat was not known to the Romans.

The following papers were read:—

1. "On the Brain of the Edentata, including *Chlamydophorus*." By Dr. Elliott Smith. (Communicated by Prof. G. B. Howes, Sec. L.S.)
2. "Preliminary Account of some New Zealand Actiniaria." By Mr. H. Farquhar. (Communicated by T. W. Kirk, F.L.S.)

April 21st, 1898.

Dr. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Messrs. Horace Taberer Brown and Albert Howard Trow were elected Fellows, and Dr. Otto Stapf and Mr. William Plane Pycraft, Associates of the Society.

In view of the approaching Anniversary Meeting, Messrs. Osbert Salvin and Antony Gepp were elected Auditors on behalf of the Council, and Messrs. Thomas Christy and Edward A. Batters on the part of the Fellows.

On behalf of Lieut.-Col. Birch-Reynardson there was exhibited a portion of the trunk of an apple-tree which had been so seriously attacked by Water Voles (*Arvicola amphibius*) as to cause the death of the tree, and several others, it was stated, had been similarly injured. Such extensive damage from such a cause was regarded as unusual.

Mr. G. E. Barrett Hamilton exhibited a head of the common Brown Rat (*Mus decumanus*) showing a curious deformity arising from injury to the incisor teeth.

The following papers were read:—

1. "On the Structure of *Dendroceros*." By Prof. Douglas H. Campbell, F.M.L.S.
2. "On the Morphology of the Owls (Part I. Pterylography)." By W. P. Pycraft, A.L.S.
3. "On the Thymus and Thyroid of Marsupials." By James Johnstone, A.R.C.S. (Communicated by Prof. G. B. Howes, Sec. L.S.)

May 5th, 1898.

Dr. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Messrs. William George Freeman, Albert William Brown, and Horace Taberer Brown were admitted Fellows of the Society,

Mr. George Nicholson was elected a Fellow, and Dr. Bernard Renault and Prof. Max C. W. Weber were elected Foreign Members.

The following papers were read:—

1. "On some Spitzbergen Collembola." By Sir John Lubbock, Bart., M.P., F.R.S., F.L.S.
2. "On the Structure and Development of *Soranthera*." By Miss Ethel Barton. (Communicated by George Murray, F.R.S., F.L.S.)
3. "The Species, the Sex, and the Individual." By Mr. J. T. Cunningham. (Communicated by Prof. G. B. Howes, Sec. L.S.)

May 24th, 1898.

*Anniversary Meeting.*

Dr. ALBERT G. L. G. GÜNTHER, F.R.S., President in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. Osbert Salvin, on behalf of the Auditors, presented the Treasurer's Annual Statement of Accounts, duly audited, as shown on p. 12.

The Senior Secretary read his report of deaths, withdrawals, and elections of new Fellows for the past year as follows:—

Since the last Anniversary Meeting 18 Fellows had died, or their deaths been ascertained, viz.:—

Mr. Joseph Armitage.	Mr. Charles John Leaf.
Mr. Edmund John Baillie.	Dr. José Camillo Lisboa.
Mr. James Bateman.	Sir J. R. Gibson Maitland.
Mr. Isaac Byerley.	Dr. Christopher Knox Ord.
Sir William Lambert Dobson.	Rev. Charles William Penny.
Mr. Joseph William Dunning.	Mr. Alfred Geo. Renshaw.
Dr. John Braxton Hicks.	Mr. William Scott.
Mr. Thomas Kirk.	Mr. Robert Warner.
Prof. Mark Henry Lackersteen.	Mr. William Wickham.

ASSOCIATE, 1.

Dr. Thomas Jeffery Parker.

FOREIGN MEMBERS, 3.

Dr. Rudolph Leuckart.

Dr. Julius von Sachs.

Prof. Johann Japetus Steenstrup.

*Receipts and Payments of the Linnæan Society, from May 1st, 1897, to April 30th, 1898.*

<i>Receipts.</i>		<i>Payments.</i>	
	£ s. d.		£ s. d.
Balance at Bankers on the 1st May, 1897	300 4 4	Taxes and Insurance	12 13 9
Interest on Investments	195 18 8	Repairs and Furniture	174 12 0
Admission Fees	156 0 0	Coals and Gas	88 7 0
Annual Contributions	1386 17 7	Salaries	730 6 8
Compositions	396 0 0	Library:—	
Sales of Publications:—		Books	£155 9 1
Transactions	£ 69 12 10	Binding	99 5 11
Journals	100 19 9		
Proceedings and Catalogues	4 1 0	Expenses of Publications:—	254 15 0
		Printing	£470 14 7
Miscellaneous Receipts	174 13 7	Illustrations	355 9 6
	43 14 9	Distribution	50 18 0
		Miscellaneous Printing and Stationery	877 2 1
		Petty Expenses (including Tea and Postage)	57 2 10
		Investment of Compositions	112 9 4
		Balance at Bankers on 30th April, 1898	100 0 0
			246 0 3
			<u>£2653 8 11</u>

*Investments on the 30th April, 1898.*

	£ s. d.	£ s. d.
Consols, 2 $\frac{3}{4}$ per cent.	4037 5 1 @ 111 $\frac{1}{8}$	4486 7 11
Metropolitan 3 $\frac{1}{2}$ per cent. Stock	1079 11 3 @ 117	1263 1 9
Great Indian Peninsula Railway 5 per cent. Guaranteed Stock	650 0 0 @ 167 $\frac{1}{2}$	1055 5 0
Forth Bridge Railway 4 per cent. Stock	450 0 0 @ 141 $\frac{1}{2}$	636 15 0
Consols (Westwood Bequest), 2 $\frac{3}{4}$ per cent.	249 3 8 @ 111 $\frac{1}{8}$	276 18 1
		<u>£7718 7 9</u>

FRANK CRISP, *Treasurer.*

A. GÜNTHER,  
 THOMAS CHRISTY,  
 EDWARD A. BATTERS, }  
 OSBERT SALVIN,  
 ANTONY GEPF, } *Auditors.*  
 G. B. HOWES, }

Audited and found correct.  
 12th May, 1898.

During the past official year 3 Fellows had withdrawn, viz.: Rev. H. Aldwin Soames, Mr. F. Victor Dickins, and Mr. Donald Petrie; and 1 Associate, viz., Mr. Henry O. Forbes;

Mr. George Nicholson had been removed by election from the list of Associates to that of the Fellows;

And 23 Fellows, 4 Associates, and 2 Foreign Members had been elected.

The Librarian's Report was read as follows:—

“During the past year there had been received as Donations from private individuals to the Library 65 volumes and 123 pamphlets and separate impressions of memoirs.

“From the various Universities, Academies, and Scientific Societies there had been received in exchange and otherwise 210 volumes and 130 detached parts, besides 68 volumes and 64 parts obtained by exchange and donation from the Editors and Proprietors of independent periodicals.

“The Council at the recommendation of the Library Committee had sanctioned the purchase of 237 volumes and 121 parts of important works.

“The total additions to the Library were therefore 580 volumes and 438 separate parts.

“The number of books bound during the year was as follows:—In half-morocco 475 volumes, in half-calf 7 volumes, in full-cloth 174 volumes, in vellum 36 volumes, in buckram 6 volumes, in boards or half-cloth 10 volumes. Relabelled (half-morocco and cloth backs) 75 volumes. Total 783 volumes.”

The Senior Secretary having read the Bye-Laws governing the elections,

The President opened the business of the day, and the Fellows present proceeded to vote for the Council and Officers.

The ballot for the Council having been closed, the President appointed the Rev. Thomas R. R. Stebbing, Mr. Thomas Rogers, and Mr. Arthur Lister, Scrutineers, and the votes having been counted and reported to the President, he declared the following members to be removed from the Council, viz.:—Dr. John Anderson, Mr. Antony Gepp, Dr. St. George Mivart, Mr. W. Percy Sladen, and Mr. A. Smith Woodward, and the following gentlemen to be elected in their stead, viz.:—Mr. Charles Baron Clarke, Prof. William Abbot Herdman, Mr. Albert D. Michael, Mr. Horace W. Monckton, and Mr. Howard Saunders.

The ballot for the Officers having been closed, the President appointed the same Scrutineers, and the votes having been counted and reported to him, he declared the result as follows:—

*President*, Dr. Albert C. L. G. Günther.

*Treasurer*, Mr. Frank Crisp.

*Secretaries* { Mr. B. Daydon Jackson.  
Prof. George Bond Howes.

The President then delivered his Address.

## THE PRESIDENT'S ANNIVERSARY ADDRESS.

THE subject which I have selected for my Address is one to which I paid much attention some twenty years ago, which I have never lost sight of since, and the study of which I intend to resume, not only with much larger materials, but also with the advantage of the labours of others who have opened up new vistas, or thrown light into corners where I groped in the dark. The subject is that Chelonian type which is generally known as "Gigantic Land-Tortoises;" which in Tertiary ages occupied a wide range in the Northern Hemisphere, but is now reduced to the fast expiring tenancy of a few oceanic islands. I trust I shall be able to awaken your interest in this type. Although long neglected, it should take its due position in the inquiry into certain great biological questions, quite apart from the smaller problems which legitimately fall to the share of the specialist.

In order to render the following remarks readily intelligible to all, I may be permitted to recapitulate shortly the principal facts of the history and distribution of these animals. They are typical Land-Tortoises whose structure does not essentially differ from that of our small European species: they are only gigantic reproductions of the ordinary type, some of the living forms attaining a weight of some 700 pounds, and a length of carapace of 4 or 5 feet. Yet, even such giants are far surpassed in size by some of the Tertiary species, notably those of the Sivalik Hills.

Large species of *Testudo* occur, among a host of smaller forms, as far back as the Eocene, in North America\* as well as Europe†. Their remains are more numerous in Miocene and Pliocene formations. They have been found in various localities in France and South Germany, in Malta, on the Lebanon, in the Sivaliks; and, in North America, in similar formations of Nebraska and Wyoming‡. Some of these fossils, so far as they are known, approach very closely to the species of our time. Even such a slight advance of specialization as distinguishes the *Testudo atlas* of India, and which consists in the bifurcation of the epiplastron, reappears, though in a modified form, in a Mauritian tortoise recently described by Gadow.

These Tertiary Tortoises have left no descendants on the continents of the Old or New World: they were unable to survive

\* *Hadrianus*, Cope.

† Lydekker, *Cat. Foss. Rept.* B. M. iii. p. 91.

‡ The Chelonian remains hitherto discovered in South America are in too fragmentary a condition to admit of useful comparison. So far as I know, none are known from the African continent.

the changes of climate in the northern latitudes, or to co-exist with the large Carnivora, and especially with man, in the more congenial South\*. But there are two spots on the earth where they continued to flourish to within a century or two of our time: viz., Madagascar and the neighbouring islands in the Western Indian Ocean, and the Galapagos Archipelago in the Eastern-most part of the Pacific.

The historical evidence of their existence in Madagascar is extremely scanty and vague†. They had been cleared off from the inhabited parts of the island at the time when the first Europeans landed. If any of them had existed near the districts occupied by the French settlers of the seventeenth century, they would have been mentioned in some of the reports on the natural productions of the country which these people sent home. But their osseous remains, some in very perfect condition, and of comparatively recent appearance, show that these animals were at one time widely spread over the island; they are often found associated with bones of *Æpyornithes*, Hippopotamus, cattle, and belong to two or three species. Their extermination probably began with the arrival of man in Madagascar; and it is highly improbable, though by no means impossible, that some individuals have survived and still linger in the vast tracts of country which are still unexplored.

Very different were the conditions of life in the islands which are scattered over the ocean in a semicircle round the north of Madagascar. With the exception of the Comoro group, none of these islands were inhabited by man or large mammals. Consequently the Tortoises lived there in absolute security for ages, and multiplied to a degree which excited the admiration of all the early European visitors. They occupied in incredible numbers not only the larger islands of the Aldabra group, the Seychelles, Reunion, Mauritius, Rodriguez, but also the small ones with an area of a few square miles only, and with their highest points raised scarcely 100 feet above the level of the water, provided that the coral soil produced a sufficient amount of vegetation to supply them with food and shelter from the sun. Of this we have not only the testimony of trustworthy voyagers of the last two centuries, but the direct evidence of remains which accident now and then brings to the surface. A short time ago I received from my friend, Dr. Bruce, a resident at Mahé, to whom many a naturalist is indebted for assistance and hospitality, the well-preserved egg-shells of a gigantic Land-Tortoise, imbedded in a conglomerated mass of coral-sand. They came from a small island of the Amirante group, on which Dr. Bruce formed a plantation of Coconut-palms, and on which

\* Lydekker (10), p. 164.

† For instance, "Nous les [les tortues de terre] faisons venir des Seychelles et de Madagascar, q: bientôt ne pourront plus nous en fournir." Billiard, *Voy. aux Colonies orient.*: Paris, 1822, p. 451.

no Tortoise had ever been known to live. In order to secure the moisture requisite for germination and the growth of the seedling, it was necessary to plant the nuts in pits dug through loose sand to a depth of about 3 feet, and then through a crust of solidified coral-sand of one foot thickness. It was below this crust that the eggs were found, showing that probably centuries had elapsed since the eggs were deposited, and indicating at the same time that we shall have to go below the surface, if we want to become acquainted with the extinct autochthont races of these islands.

The sad history of the extermination of the Mascarene Tortoises is so well known that I may dispense with a repetition of its details. I will only allude to some facts with which I have become recently acquainted. The Tortoises, as you know, had proved excellent and more wholesome food than Turtle. Therefore every passing ship stowed away for her long voyage as many as she could carry. With the increase of the population of the settlements, augmented by military and naval forces, the indigenous supply was rapidly exhausted; it was then supplemented by importation from other islands, and we can form an idea of the extent to which this inter-insular transport was carried from official reports to the French Indian Company\*. In 1759 four small vessels were specially appointed for the service of bringing Tortoises from Rodriguez to Mauritius: one vessel carried a cargo of 6000; and altogether more than 30,000 were imported into Mauritius within the space of eighteen months! †

The result of this prodigality was that, at the beginning of our century, the Tortoises had been pretty well swept off the whole of the islands in the Indian Ocean, so that at the present time only one spot remains where they have survived in a wild state, viz. the South Island of the Aldabran atoll. Although only 18 miles long and about one mile wide, it offers by its rugged, deeply fissured surface, which is overgrown with impenetrable bush, a safe retreat to the small number of the survivors ‡. Aldabra has

\* Milne-Edwards (1), 1875.

† It seems almost incredible that such a large number could have been consumed within so short a time by a population which, at that time, possessed already a considerable meat-supply in the herds of cattle and goats which had spread over the island. At any rate, a large proportion of the Tortoises must have been of small size, perhaps not more than 10 or 15 pounds in weight, and yielding about one-third of that weight in eatable meat. A portion of the imported stock may also have been used for provisioning passing Government vessels.

‡ A statement made by the present lessee of Aldabra, and contained in an official despatch (dated June 13, 1892) of Mr. T. Risely Griffith, the Administrator of the Seychelles, to the Governor of Mauritius, to the effect that "there cannot be less than one thousand (Tortoises) in all the island" has got into print (Sauzier (33), pp. 19, 20) and requires correction. In a later despatch (April 4, 1893) Mr. Griffith refers to Dr. Abbott's visit to Aldabra, who informed him "that, whilst he saw some of the Land-Tortoises (during a four months' stay), he was of opinion that Mr. Spurs's estimate of their number..... was very considerably over-estimated" Mr. Griffith himself, when he visited the island, saw none. But Dr. Voeltzkow, who stayed in the island a month in 1894, obtained seven, which afterwards were for sale at Hamburg.



never been inhabited, and only within recent years a station has been established on it for a few men who are engaged in industrial pursuits for the lessee, who rents the island from the Mauritian Government.

The history of the Tortoises of the Galapagos Islands is almost a counterpart of that of the Indian races. At the time of the discovery of this Archipelago, in the sixteenth century, the Tortoises were distributed in immense numbers over most of the islands; they are now restricted to three only—Albemarle, Duncan, and Abingdon. In the first, the largest island of the group, the conditions of large tracts of the interior are similar to those in Aldabra, and offer to the Tortoises effective protection. A search, in which four persons were engaged for ten days, rewarded Dr. Baur, who visited the island in 1891, with the capture of five adult specimens. Duncan Island seems to be much more accessible and less adapted for concealment, so that in all probability the life of the race peculiar to this island will not be prolonged for many years; but of this we may expect to receive before long positive and valuable information, when the results of the Rothschild expedition to the Galapagos shall be made known. Nothing is known of the state of the Tortoises in Abingdon since Captain Cookson's visit in 1875. There are no settlements on either of these islands.

The ease with which, in a congenial climate, these large Tortoises can be kept in a state of captivity, and the regularity with which they annually produce their progeny, have induced many colonists, especially in Mauritius and the Seychelles, to add them to their domestic stock. They were occasionally brought thence to Europe, giving rise to the belief that those islands were their true and original home. However, from the information which I obtained from residents and visitors to the Seychelles, as well as from actual examination of the specimens, I came to the conclusions\*, first, that the whole of this domestic stock had been imported from Aldabra, or had been bred from Aldabran parents, there being frequent communication between the two islands†; and, secondly, that if the Seychelles had produced a peculiar race it was extinct, like those of Mauritius, Reunion, and the other Mascarenes. M. T. Sauzier, who has paid much attention to the historical aspects of the question, differs from this view: he has collected from ancient records undeniable evidence that the Seychelles were really occupied by Gigantic Tortoises, like the other islands, and he moreover expresses it as his belief that this race has left its direct descendants among the semi-domesticated

\* Gigant. Land-Tort. p. 3.

† Captain F. Moresby, in a memoir on the Seychelles written in 1821, says that the Land-Tortoises are very abundant in Aldabra, that they grow to a large size and are imported to Mahé or Mauritius, where they sell for three Spanish piastres apiece (Naut. Mag. for 1842, vi. p. 676); and G. Harrison, in a note written on the Seychelles in 1837, states that the Land-Tortoise is imported from Aldabra and much esteemed as food by the inhabitants, but that it is getting scarce (ibid. for 1839, iii. p. 443).

Tortoises. M. Sauzier may be correct in this belief, but he has failed to bring forward any satisfactory proof of his assertion. I shall have to return to this subject later on, when referring to the Colombo Tortoise.

When I commenced the study of these animals, I found the opinion of zoologists with regard to them very much divided. Few adopted the view of the French herpetologists, Duméril and Bibron, who had described eight distinct species in their great work. The majority were inclined to regard all these animals as belonging to two (an Indian and a Pacific type), or even to one species which, by man's agency, had been carried to, and distributed over, various distant parts of the globe, and for which the general appellation "*Testudo indica*" was adopted. On the whole, the zoologists of my younger years took little interest in them, and many a specimen which is now valued as one of the treasures in a collection had been stowed away among the curiosities of the lumber-room.

I was enabled to throw some light on the matter by the fortunate concurrence of several circumstances, chief of which were—the discovery of numerous remains in Mauritius, where the search for Dodo- and other bird-bones was actively carried on by the late Sir E. Newton; the arrival of the large collections made during the Transit-of-Venus expedition in Rodriguez, and entrusted to me by the Royal Society; the assistance which I received from Lord Stanmore, then Governor of Mauritius, from Capt. (now Sir) W. J. L. Wharton, F.R.S., who was engaged in a survey of the East-African coast, from Admiral the Hon. A. A. Cochrane, by whose orders Commander Cookson visited the Galapagos, and from many other correspondents. I was able to show that among the material thus brought together three distinct types could be distinguished, either by osteological characters or the number of dermal scutes, viz.:

1. The Aldabran type,
2. The Mascarene type,
3. The Galapagos type;

and, moreover, that several species were included in each of these three groups; that each species seemed to be limited to a particular island, but that some of the islands, like Aldabra, Mauritius, Albemarle, were tenanted by several species.

The subject was full of contentious matter, and, after all, the material upon which I based my conclusions was most perplexing in its incompleteness. But I have the satisfaction of seeing that since the publication of my work some 50 papers and memoirs\* have appeared, all contributing towards our knowledge of one or the other of these animals, and some opening up questions of wider biological interest. The material which one of our Fellows, the Hon. Walter Rothschild, is at present bringing together with his usual energy and directness of purpose, no

\* See Appendix, pp. 26–29.

doubt will offer, by its completeness, an opportunity of revising the subject in all its details.

The contributions which, in my opinion, mark the most important advance, and which throw a flood of light on the origin of this Chelonian type and its distribution in space and time, are those referring to its occurrence in Madagascar. Indeed, Grandidier, as far back as 1868, had mentioned his discovery of Chelonian bones; but their true interpretation was left to Vaillant and Boulenger, who showed that they were true *Testudo*, and, moreover, that they belonged to the Aldabran section. Vaillant referred them to two species; but additional materials, more recently received in England, seem to indicate that the species were more numerous, as we might have anticipated from the wide distribution of the type in Madagascar, to which I have referred already.

The second important discovery to which I would draw your attention is published in a paper by Dr. Gadow, who described a number of Chelonian remains that were found in the Mare-aux-Songes about 1890: this is the same locality from which I had previously described two *species*. Of the five "*forms*" distinguished by Dr. Gadow, one claims our particular attention, although it is known from fragments of the sternum only. It differs from all the other Mascarene Tortoises, not only in having a divided gular shield, but by having the anterior part of the sternum bifurcated, reminding us of a similar modification of the corresponding part in *Testudo atlas* from the Sivaliks\*. I do not think that this discovery affects my division of the Gigantic Land-Tortoises into three sections; I have no doubt that when we shall have more information, notably of the form and scutellation of the head, there will be found sufficiently strong ground to establish a fourth section for this new Mascarene *species*.

Nor can we be certain that this Tortoise (or, perhaps, another of those found in the Mare-aux-Songes) was really indigenous to Mauritius, as Dr. Gadow assumes. The Mare-aux-Songes is a swamp close to the sea, separated from it by a ridge, and situated near Grand Port, a place founded by the early Dutch visitors, where, of course, in the course of succeeding years many ships landed. Therefore, the possibility of some of the bones from this locality being those of imported individuals cannot be excluded; and this will apply more to the forms occurring in small numbers than to the more common ones, although no one will suggest any other origin but from some part of the Mascarene region.

It must appear a matter of some surprise that zoologists who have studied the distribution of animals in space and time have

\* Is the bifurcated sternum a sexual character? Mr. Lydekker seems to think so, as far as *Testudo atlas* is concerned. It may be so in one species, and yet be absent in both sexes in another. The large specimen with double gulars in the military barracks at Port Louis is a male, and shows no sign of bifurcation.

made so little use of the evidence afforded by Land-Tortoises. Darwin, no doubt, would have paid more attention to them if he had been in possession of facts with which we are acquainted now. As it is, he saw in them (together with the large Lizards) the most characteristic feature of the zoology of the Galapagos; but he found them illustrative only as far as they confirmed results obtained from the plants, which had been worked out by the highest authority on geographical botany.

Mr. Blanford (18. p. 54), in one of his Anniversary Addresses to the Geological Society, says:—"The occurrence of Land-Tortoises on what appear to be evidently oceanic islands, such as the Galapagos, although unexplained, renders the *Chelonia* less important as evidence of land-connection." Of terrestrial vertebrates I do not know of another type which, from its organization and mode of life, would assist more in the solution of that and other problems than Batrachians and Land-Tortoises. There *must be* a satisfactory way of accounting for the presence of those gigantic forms in two island groups separated from the mainland by hundreds of miles. But I confess that the explanation suggested by Mr. Wallace ('Island Life,' p. 279) does not appeal to me as the probable solution of the problem. He says\*:—"Considering the well-known tenacity of life of these animals, and the large number of allied forms which have aquatic or subaquatic habits, it is not a very extravagant supposition that some ancestral form carried out to sea by a flood, was once or twice safely drifted as far as the Galapagos, and has originated the races which now inhabit them." Are the difficulties offered in this suggestion not quite as weighty from a biological point of view as the objections raised by geology? We cannot be surprised to see the latest student of the Galapagos fauna, Dr. G. Baur, returning for help to the explanation by the long-disputed land-connection in the Tertiary epoch.

Dr. Baur treats in a series of papers of the very peculiar composition and distribution of the Flora and Fauna of the Galapagos. These peculiarities have been long known through the labours of Hooker and Darwin, and have been described † by the latter in his admirably simple language. "It is the circumstance that several of the islands possess their own species of the tortoise, mocking-thrush, finches, and numerous plants, these species having the same general habits, occupying analogous situations, and obviously filling the same place in the natural economy of this Archipelago, that strikes me with wonder. It may be suspected that some of these representative species, at

\* Wallace has misunderstood my words (Gigant. Land-Tort. pp. 8, 9) when he says that "Dr. Günther believes that they (the Galapagos Tortoises) have been originally derived from the American continent." Without committing myself to adherence to either theory, I merely indicated the manner in which the advocate or the opponent of the doctrine of a common origin of similar but locally separated types may account for the presence of the Tortoises in distant oceanic islands.

† Journal of Researches, ed. 1873, p. 397.

least in the case of the tortoise and of some of the birds, may hereafter prove to be only well-marked races; but this would be of equally great interest to the philosophical naturalist." Dr. Baur lays particular stress upon this condition, to which he applies the term "harmonic distribution," maintaining that such a distribution could never have come about by the accidental arrival of a miscellaneous set of plants and animals, of some on this, of others on another island, and that it can be only explained by, and therefore proves, the formation of the islands by subsidence of their common base. They are the tops of the volcanic mountains elevated on a large and continuous mass of land\* which is now submerged below the water, but which probably in the Eocene period, and possibly a little later, was still in connection with the continent, possibly in the direction of the great Mexican and Sonoran province. At the time when the islands were still connected, the number of species inhabiting the district was small; when they became separated, "through isolation the peculiar specialization of the species began: an originally single species was differentiated in many different forms; every island developed its peculiar race."†

Professor Alex. Agassiz (30) has severely criticised Dr. Baur's view, on the ground that it is entirely opposed to geological evidence. Separated from the mainland east and northwards by a broad plain, declining in the deepest parts to 1500 and 2000 fathoms, without an intervening series of shallower soundings or islands in the direction of the supposed former connection with America, the Archipelago shows no trace of archaic rocks, and, moreover, the petrographic character of its volcanoes is basaltic, thus differing from the volcanoes of the mainland, which are made up of trachytic and andesian material. Suess ‡, in alluding to the divergence of opinion as regards kœnozoic changes of land and water, considers biological facts to be of but secondary importance, and therefore would lend the weight of his authority to the opinion of Agassiz.

Yet the position taken up by Dr. Baur need not be abandoned as hopeless, in spite of the absence of direct geological evidence. The biologist now and then may give a helping hand to the geologist.

The analogy between the Galapagos and Eastern Gigantic

\* Mr. Blanford concurs with Prof. Bonney that the occurrence of volcanic islands does not prove that the area in which they occur is not a sunken continent. "If Africa south of the Atlas subsided 2000 fathoms, what would remain above water? So far as our present knowledge goes, the remaining islands would consist of four volcanic peaks—Cameroons, Kenia, Kilimanjaro, and Ruwenzori,—together with an island" etc. (Anniv. Address Geol. Soc. 1890, p. 34). This same idea is expressed by Dr. Baur (1891, p. 307) thus:—"If Central America should disappear by-and-by through subsidence, the result would be that the tops of the highest mountains would form volcanic islands, some with still active volcanoes."

† 22. p. 308.

‡ Antlitz d. Erde, i. p. 536.

Land-Tortoises is so great that, having failed to account in a generally convincing manner for the presence of these animals in the Galapagos, we naturally turn to the other group to see whether a consideration of the geological conditions in the Indian Ocean leads to more satisfactory results. Will that consideration give us a clue as to the direct genetic relations between those Pleistocene giants and their insular representatives? In a masterly treatise on ancient land-connections which Mr. W. T. Blanford embodied in his Anniversary Address to the Geological Society in 1896, all the evidence, geological as well as biological, is collected, by which he proves that such a connection did exist across the Indian Ocean between India and Madagascar. Even Mr. Wallace, who is one of the most emphatic opponents of the doctrine of extensive changes of land and water in Tertiary times, feels compelled to assume that the areas now occupied by the Laccadive, Maldive, and Chagos atolls, and the Saya de Malha and Cargados reefs, are the remains of great islands which existed in late Tertiary times. He admits subsidence so far, because the existence of such intervening islands would facilitate the introduction of certain Birds and Bats which are common to India and Madagascar. But the distances by which these Tertiary islands were separated from the Mascarenes and Madagascar are still too great to meet the requirements of the case of the Tortoises. Absolutely helpless, these animals could not make active progress in the water and would perish long before a favourable current carried them to a distant shore. Dispersal by accidental means may be set aside in their case as utterly incomprehensible and inadequate; they require, for spontaneous dispersal, continuity of land. Now the researches of W. T. Blanford, of his brother H. F. Blanford, and other Indian geologists, of Suess, and Neumayer, definitely prove the existence of a wide area which connected South Africa and India, and of course included Madagascar, the Seychelles, Mascarenes, and other islands. The continuity of this area began to be encroached upon by the Ocean in Mesozoic times, and was gradually broken up into islands at an early Tertiary date (*Blanford*). On the other hand, the slow evolution of this Chelonian type, which has scarcely changed since the Eocene, and its wide distribution in that era over the Northern Hemisphere, justify the supposition that it was in existence already before the Tertiary, before the bridge was broken through which allowed of its passage southwards or northwards.

From the available palæontological evidence, the majority of naturalists would incline to the belief that the Pliocene continental forms were the ancestors of the insular races, or, in other words, that the type has migrated southwards. Thus Mr. Lydekker (1885, p. 163) says that "it appears not improbable that the Aldabra Tortoises are a branch which has taken origin from the old Indian stock of gigantic Land-Tortoises." However, Continental and Insular forms differ structurally so slightly from each other, that we cannot draw from their structure safe conclusions as to their relative ages. Forms with a bifurcated

epiplastron might be regarded as more highly specialized than those without; but they occur in the Mascarenes as well as in the Sivaliks: or, if we look upon the flat-headed Mascarene races as the more generalized form, we find it equally represented in the Pliocene and Pleistocene of Europe. The great ancient Southern Continent, the Gondwana Land of Suess, of the existence of which we cannot entertain any doubt, must have been the birthplace of a variety of plants and animals, of terrestrial Vertebrates, possibly of gigantic Land-Tortoises: if this be so, then these Testudinata would have to be regarded, not as accidental importations from some distant continent, but as members of the autochthonous Gondwana-fauna, which spread through Asia into Europe in pre-Tertiary or early Tertiary times, and survived on the insular fragments of the old continent.

However the direction in which the dispersal of the Tortoises proceeded, either from the north southwards or *vice versa*, is a secondary question which could be more profitably discussed, if we knew more of the palæontology of the Seychelles and Madagascar. But, so much we may claim at present, that Dr. Baur's theory of the origin of the Galapagos fauna, when applied to the problem offered by the Tortoises in the Indian Ocean, is actually removed from the hypothetical area, and supported by geological and biological facts. It thereby has gathered strength, and deserves our serious consideration. It has met with strong opposition from some, with favour by others, of whom I will mention only one of our own fellows, Mr. Hemsley\*, who has paid so much attention to Insular Floras†.

Before concluding my Address I must ask you to return with me once more to the small stock of Tortoises which have survived to our time. I wish shortly to refer to certain individuals that are known to have been living in captivity for a long time, for so many years that they carry us back into the period when some of the now extinct races were still in existence. Curiosity is naturally excited as to the origin of these specimens, and the race to which they belong.

1. Perhaps the most famous of these individuals is the large Tortoise which lived at Colombo for nearly a century. According to one account it was brought from Java to Ceylon when this island was still a Dutch possession; according to another it came direct from the Seychelles in 1798‡. It died four years ago,

\* Science Progress, v. 1896, pp. 298-302.

† A few weeks after the delivery of this Address, the sad news of the premature death of Dr. Baur reached London. He died at Munich on June 25, in the fortieth year of his age.

‡ "The Colombo Tortoise for many years belonged to my father-in-law, the late Sir William Ogle Carr, Chief Justice of Ceylon, and was still in the grounds of Uplands in 1882 when I saw it, and have since seen a photo taken at Colombo as late as 1889. This one is said to have been brought as tribute to Ceylon from the Seychelles about 1798, and remained on the grounds where it was landed, descending with the Estate to each proprietor."—Letter to Dr. Günther by Mr. J. Carr S. Dyer, dated Hazeley, Kenley, Jan. 12, 1893.

and was preserved for the Colombo Museum by Mr. Haly, to whom I am indebted for sketches of the stuffed animal and for the loan of some of the bones. So far as I am able to judge from these somewhat incomplete materials, this animal certainly belongs to the same group of races with a narrow bridge of the pelvis which includes the Madagascar and Aldabra Tortoises. Unable to identify it with any of the races described, I consider it not improbable that this animal really came originally from the Seychelles, and was the last, or one of the last survivors of the Seychelles race. On geographical grounds one may anticipate that the Seychelles race would belong to the Aldabran group rather than the Mascarene. But positive evidence on this point can only be given when remains of undoubtedly indigenous specimens are examined, and these have still to be discovered.

2. M. Sauzier has drawn attention to a most interesting specimen which has been known to have been kept at Port Louis since Mauritius became a British possession in 1810, and is still living there in the barracks of the garrison. Captain Pasfield Oliver carries its history still farther back, and (on what grounds I am unable to find out) ascribes its importation into Mauritius from the Seychelles in 1766 to a Frenchman, Captain Marion du Fresne. M. Sauzier and Dr. Gadow, however, consider it a native of Mauritius. From various photographs which have been published, and others for which I am indebted to Capt. Oliver, it is evident that this Tortoise, named *Testudo sumeirei* by Sauzier, belongs to the group of Mascarene Tortoises with double gulars which has been described by Gadow, and, therefore, is also a survivor, perhaps the last, of an extinct race, the original home of which is not yet known.

3. The third specimen to which I would draw your attention, is the Tortoise so well known for many years to visitors to St. Helena. The information which has reached me about it shows that tradition as regards the history of these animals is very unreliable, and has to be received with great caution. According to all accounts, the specimen is a female which was brought to St. Helena from Mauritius more than a century ago. At a later period a male, larger than the female, was imported as her companion; and both were in excellent health when seen by Mr. H. Ringler Thomson, to whom I am indebted for this information. The male is reported to have died in 1877, but another seems to have been provided, as would appear from a letter of Mr. Grey Wilson, Governor of the Island, to Capt. P. Oliver\*. The shell of the specimen which died in 1877, and

\* St. Helena, 26 Oct. 1894. "The old Tortoise is still hale and hearty, *i. e.*, the female of about 200 summers. We have a rather larger one also, a male which was imported in 1882; and they had a happy existence, always going to the lower lands in winter, and coming to our lawn in the summer. The male arrived yesterday, but I hear the female is in Friar's valley below the waterfall [some 3 or 4 miles distant from the Plantation house]; and I expect I shall have to send a rescue party to get her up, as she ought to have arrived with her husband yesterday."



which was said to have been the first husband, has fortunately been preserved, and is in the Natural History Museum. It proves to be the shell of a *female*, and without doubt that of the individual originally imported into St. Helena. If this shell had not been preserved, the whole of its age would have been placed to the credit of one of the two survivors. The specimen is of great interest, being distinguished by a nuchal shield of unusual size, divided into two by a transverse suture.

4. For the first information of another of these patriarchs we are likewise indebted to M. Sauzier (1895), who ascertained its existence in Egmont Island, Chagos Archipelago. Its original habitat is supposed to be Aldabra, but when and by whom it was carried to Egmont Island is not known\*. This specimen (believed to be the largest living Tortoise) has been acquired by the Hon. W. Rothschild, and is now living in the Zoological Gardens, so that in course of time the whole of its structure can be examined.

5. Another very large Tortoise, of the Galapagos type, is the latest acquisition of Mr. Rothschild, and lives now side by side with the Egmont Island Tortoise. Only the latest phase of its adventurous wanderings is known. It was brought to Sydney about the year 1880 by a Captain Alexander Macdonald, who had received it as a present from a chief in Rotumah Island (Madison Island)†. When we recollect that Captain Porter ‡, on his voyage from the Galapagos, visited Madison Island in 1813, that he "distributed there from his stock several young Tortoises among the chiefs, and permitted a great many to escape into the bushes and among the grass," we shall look upon this specimen as one which actually witnessed the depopulation of its island home.

For the future preservation of the Tortoises which still survive in the Galapagos, we must, and can, trust to the difficulty of access to their lava recesses. But we cannot be equally confident as to the smaller remnant on Aldabra. Since a station was established in that island, about the year 1880, for fishermen and orchilla-gatherers, the animals were undoubtedly exposed to the danger of complete extermination at an early date. However, an appeal § to the Mauritian Government, which was supported by Sir Joseph Hooker, then President of the Royal Society, had the immediate result that the protection of the Tortoises was made one of the conditions under which the island

\* Although of very large size, this specimen does not show the signs of extreme age which were manifest in the Colombo Tortoise. Mr. Rothschild was informed by its owner, that it had been known to exist on Egmont Island some 150 years (Nov. Zool. 1897, p. 407), but M. Sauzier tells us (*La Nature*, 1895, p. 274) that the first settlement was formed from Mauritius at the commencement of the century.

† I am indebted for this information to Hon. W. Rothschild.

‡ *Journal of a Cruise made to the Pacific Ocean*, 1822, vol. ii. p. 109.

§ *Gigant. Land-Tort.* p. 20.

was leased. I believe that the Administrator of the Seychelles is responsible for the conditions of the lease being adhered to. Of course, it is difficult to exercise supervision and enforce obedience to orders in an out-of-the-way place like Aldabra, hundreds of miles away from administrative headquarters. But it is highly satisfactory that ever since the matter was brought under the notice of the Mauritian Government, not only the succeeding Governors, but also the Colonial Office, have continued to watch with interest over the safety of these animals. Besides, I see from the official reports which are sent to me from time to time, that Tortoises, whenever procurable, are located in suitable places nearer to the seat of Government, where they can be kept under immediate supervision. Thus, in 1883, several were placed on Flat Island; and Mr. Cockburn Stewart, the present Administrator of the Seychelles, reported in 1896 that forty-two were deposited on Curieuse Island, and eight in the Government House grounds: all thriving well.

Thus the existence of this type may be considered assured for our time at least, but it will be the duty of the Biologists who come after us to see that this protection, for which we offer our grateful acknowledgments to the men who direct Colonial affairs at present, will be continued by their successors.

## APPENDIX.

### LIST OF PUBLICATIONS ON GIGANTIC LAND-TORTOISES *between the years 1875-1898.*

- 1875.
1. MILNE-EDWARDS, A. Nouveaux documents sur l'époque de la disparition de la Faune ancienne de l'île Rodriguez. *Ann. Sc. Nat.* art. no. 4, pp. 20. (Abstract in *Compt. Rend.* 10 May, 1875, t. lxxx, p. 1212.)
  2. CALDWELL, J. Notes on the Zoology of Rodriguez. *Proc. Zool. Soc.* 1875, pp. 644-7.
- 1877.
3. ADAMS, A. LEITH. On Gigantic Land-Tortoises and a small Fresh-water species from the Ossiferous Caverns of Malta, together with a List of their Fossil Fauna; and a Note on Chelonian remains from the Rock-cavities of Gibraltar. *Quart. Journ. Geol. Soc.* xxxiii. 1877, pp. 177-191, pls. 5 & 6.
- 1878.
4. [Official.] Report on the Islands of Astove and Assumption and the Cosmoledo and Aldabra Groups. Seychelles. fol. [Report by Sergeant F. Rivers to the Chief Civil Commissioner of the Seychelles, d. Decbr. 11, 1878.] Pp. 7.
- 1879.
5. WOLF, TH. Ein Besuch der Galapagos Inseln. Heidelberg. 8vo: pp. 44, with 3 maps.
- 1881.
6. HUBRECHT, A. A. W. On certain Tortoises in the collections of the Leyden Museum. Notes from Leyden Mus. iii. pp. 41-44.

1881.

7. HADDON, A. C. On the Extinct Land-Tortoises of Mauritius and Rodriguez. Trans. Linn. Soc., Zool. ii. pp. 155-163, pl. 13.

1882.

8. PETERS, W. Reise nach Mossambique. Amphibien. Berlin. fol.: pp. 3 & 4, pl. iii. B.

1883.

9. LITTLETON, W. Aldabra Island Tortoises. Nature, Aug. 23, 1883. p. 398.

1885.

10. LYDEKKER, A. Siwalik and Narbada Chelonia. In Mem. Geolog. Surv. Ind. Palæontol. Ind. ser. x. vol. iii. part 6. Calcutta. 4to: pp. 155-170.
11. VAILLANT, L. Remarques complémentaires sur les Tortues gigantesques de Madagascar. Compt. Rend. 1885, Mars 23, pp. 4.
12. — Description d'une Tortue terrestre d'espèce nouvelle (*Testudo yniphora*). Compt. Rend. 1885, ci. p. 440; Bull. Soc. Philom. ix. p. 118; Nouv. Arch. Mus. sér. 3, i. pp. 161-168, pls. 12-15.

1887.

13. GAUDRY, A. Découverte d'une Tortue gigantesque par M. le Dr. Donnezan. Compt. Rend. cv. pp. 1225-6.
14. DEPÉRET, C., et DONNEZAN, A. Sur la *Testudo perpiniiana*, Depéret, gigantesque Tortue du pliocène moyen de Perpignan. Compt. Rend. cv. pp. 1275-8.

1889.

15. BOULENGER, G. A. Catalogue of the Chelonians, Rhynchocephalians, and Crocodiles in the British Museum. London. 8vo: pp. 167-173.
16. LYDEKKER, R. Catalogue of the Fossil Reptilia and Amphibia in the British Museum. Part III. London. 8vo: pp. 73-90.

1890.

17. STRAUCH, A. Bemerkungen über die Schildkrötensammlung im zoologischen Museum der Kais. Akademie der Wissenschaften zu St. Petersburg. Mémoires. Ac. Imp. Sc. St. Pétersb. xxxviii. pp. 52-54.
18. BLANFORD, W. T. Address delivered at the Anniversary Meeting of the Geological Society of London, Feb. 21st, 1890: pp. 29 *et seq.*
19. BAUR, G. The Gigantic Land-Tortoises of the Galapagos Islands. Am. Nat. xxiii. pp. 1039-57.

1891.

20. OLIVER, P. The Voyage of François Leguat of Bresse to Rodriguez, Mauritius, Java, and the Cape of Good Hope. Edited and annotated by Captain P. O. London (Hakluyt Soc.), 1891. 8vo, in two volumes.
21. BOULENGER, G. A. On some Chelonian remains preserved in the Museum of the R. College of Surgeons. Proc. Zool. Soc. Lond. 1891, pp. 4-5, with fig.
22. BAUR, G. On the Origin of the Galapagos Islands. Am. Nat. 1891, pp. 217-229, 307-326.
23. LUCAS, F. A. The Galapagos and Mascarene Tortoises. Smithson. Rep. for 1889, pp. 643-647, with a plate.

1892.

24. WALLACE, A. R. *Island Life*. 2nd edit. 1892. 8vo: p. 278 *et passim*.
25. [Official.] SPURS, J. Letter from—to T. R. Griffith, Esq., on Aldabra d. July 19, 1891. In 'Colonial Reports,' C. 6563. Lond. 1892. 8vo: pp. 46-50.
26. BAUR, G. Ein Besuch der Galapagos Inseln. München, 1892. 16mo: pp. 46. (From the 'Beilage zur Allgemeinen Zeitung,' Febr. 1-4, 1892.)
27. — The Galapagos Islands. Proc. Am. Antiquar. Soc., Annual Meeting, Oct. 21, 1891. Worcester. Pp. 6.
28. SAUZIER, TH. Tortue de terre gigantesque à l'île Maurice. *La Nature*, Nov. 1892, pp. 395-398, with figures.
29. OLIVER, S. P. Mauritius and its Gigantic Tortoise. *Illustr. Lond. News*, Dec. 3, 1892, p. 715, with fig.—Also letter in 'The Times,' Jan. 11, 1893.
30. AGASSIZ, A. General Sketch of the Expedition of the 'Albatross' from February to May 1891. The Galapagos Islands. *Bull. Mus. Comp. Zool.* xxiii. no. 1, pp. 56-74.

1893.

31. GÜNTHER, A. The Mauritian Gigantic Land-Tortoise. 'Times,' Jan. 12, 1893.
32. SAUZIER, TH. Les Tortues de terre gigantesques de Madagascar, et de certaines autres îles de la mer des Indes. Paris, G. Masson. 8vo: pp. 22. [This pamphlet, for a copy of which I am indebted to the Hon. W. Rothschild, seems to have been withdrawn from the book market.]
33. — Tortue de terre gigantesque à l'île Maurice. *La Nature*, April 22, 1893, p. 336, with figure.
34. VAILLANT, L. Les Tortues éteintes de l'île Rodriguez d'après les pièces conservées dans les galeries du Muséum. *Centenaire du Mus. d'Hist. Nat.* Paris, 1893, pp. 255-288, pls. 1-3.

1894.

35. BOULENGER, G. A. On Remains of an extinct Gigantic Tortoise from Madagascar (*Testudo grandidieri*, Vaillant). *Trans. Zool. Soc. Lond.* xiii. pp. 305-311, pls. xxxix.-xli.
36. GADOW, H. On the Remains of some Gigantic Land-Tortoises, and of an extinct Lizard, recently discovered in Mauritius. *Trans. Zool. Soc. Lond.* xiii. pp. 313-324, pls. xlii.-xliv.
37. ROTHSCHILD, W. On Giant Land-Tortoises. *Novit. Zool.* i. pp. 676 7, pl. 11.
38. — Remarks and Corrections relating to the living Giant Tortoise of Mauritius. *Ibid.* p. 690.
39. — Further Notes on Gigantic Land-Tortoises. *Novit. Zool.* ii. p. 483.
40. [Official.] HALY, A. Ceylon. Administration Reports, 1894. The Colombo Museum. fol. (p. 12).

1895.

41. SAUZIER, TH. Gigantesque Tortue terrestre, d'après un spécimen vivant. *La Nature*, Sept. 28, 1895, pp. 273-275, with figures.
42. [Official.] Report on the Aldabra Group of Islands. Seychelles, Crown Lands Department. fol.: pp. 18, with maps.
43. BAUR, G. The Differentiation of Species on the Galapagos Islands and the Origin of the Group. *Biolog. Lectures* delivered at the Marine Biological Laboratory of Wood's Holl. Summer Session, 1894. Boston, 1895, pp. 67-78.

1896.

44. ROTHSCHILD, W. Further Notes on Gigantic Land-Tortoises. Nov. Zool. iii. 1896, pp. 85-91.  
 45. GÜNTHER, A. *Testudo ephippium*. Nov. Zool. iii. 1896, pp. 329-334, pls. 20-22.  
 46. VOELTZKOW, A. Riesenschildkröten von Aldabra. Zoolog. Gart. 1896, pp. 30-31.

1897.

47. OLIVER, P. The Voyages made by the Sieur D. B. to the islands Dauphine or Madagascar, Bourbon or Mascarenne in the years 1669-72. Translated and edited by Capt. P. O. London, 1897. 8vo.  
 48. ROTHSCHILD, W. Further Notes on Gigantic Land-Tortoises. Nov. Zool. iv. pp. 407-8, pl. 13.  
 49. BAUR, G. New Observations on the Origin of the Galapagos Islands, with Remarks on the Geological Age of the Pacific Ocean. Am. Nat. 1897, pp. 661-680, 864-896.

1898.

50. VAILLANT, L. Des ins inédits de Chéloniens, tirés des Manuscrits de Commerson. Bull. Mus. d'Hist. Nat. pp. 133-139 (with woodcuts).

1664.

51. KERCKHOVEN, JOHANNES VAN. Wytloopig breade en waerachtige beschryvinge van de ongeluckige voyage van't schip *Aernhem*; van Batavia vertrocken den 23 December 1631 in compagnie van noch ses andere schepen, onder 't commando van de heer Aernout de *Flamingh van Outshoorn*. Haer homst met de boot van't verlorene schip op het eylandt Mauritius, met de beschryvinge van 't selbe eylandt, etc. Beschreven door J. v. K., van Middelborg. Amsterdam, 1664. 4to: pp. 28.

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Sir John Murray then moved:—"That the thanks of the Society be given to the President for his excellent Address, and that he be requested to allow it to be printed and circulated amongst the Fellows;" and this, having been seconded by Prof. Charles Stewart, was carried unanimously.

The Gold Medal of the Society was formally awarded to Surgeon-Major GEORGE CHARLES WALLICH, M.D., in recognition of his researches into the problems connected with bathybial and pelagic life. In consequence of his inability to attend in person, his son was deputed to receive it on his behalf. In presenting the medal the President, Dr. Günther, spoke as follows:—

"The gold medal of the Society is awarded this year to a zoologist, to Dr. George Charles Wallich. Although Dr. Wallich's scientific work commenced some years before, it was the year 1860 in which he entered upon the line of inquiry with which his name will be ever associated. On the recommendation of Sir Roderick Murchison and Prof. Huxley he was attached in that year as naturalist to H.M.S. 'Bulldog,' on her voyage across the Atlantic to survey the sea-bottom for the laying of the proposed Atlantic cable. The materials obtained by the sounding

operations were slender; but in working them out, Dr. Wallich showed that he had already grasped all the principal problems of deep-sea research. To the solution of these problems he applied his wide range of knowledge, the soundness and power of his reasoning, his originality and independence of thought. His work, 'The North Atlantic Sea-Bed,' incomplete as it is, stands as a lasting record of the progress made by him in our knowledge of deep-sea life, and of the impetus which he gave to subsequent deep-sea exploration.

"For more than twenty years he continued to work in the same line of inquiry, and in investigating collateral subjects, notably the life-history, structure, and relationships of those unicellular organisms which play so important a part in pelagic and bathybial life, and the lithological identity of the ancient chalk formation and of the calcareous deposits in the oceans of the present time.

"The remarkable results which he obtained in his investigations were due not only to his accuracy and keenness as an observer, but also to the ingenuity of the methods applied by him. Thus at a time when our modern micro-chemical methods were unknown, he employed the electric discharge as a means of differentiating the nucleus, and he determined the excretory function of the contractile vacuole.

"Your Council were of opinion that work of such originality, advancing so many branches of Biology, was peculiarly fit to be honoured by the award of the Linnean medal."

A special Gold Medal was awarded by the Society to Sir JOSEPH DALTON HOOKER, G.C.S.I., C.B., P.-P.R.S., on the occasion of the completion of 'The Flora of British India,' in recognition of the Services rendered by him to Science, during sixty years of unremitting labour. In presenting the Medal Dr. Günther made the following remarks:—

"The completion of a monumental work in Botany, the 'Flora of British India,' has been chosen by our Council as a fit occasion for the Linnean Society to pay its tribute to the recognition of the eminent services which have been rendered to biological science by Joseph Dalton Hooker. A gold medal, specially struck for the occasion, of which copies could be distributed among his numerous friends and admirers, was considered to be the most appropriate and the most enduring form to serve as a memorial of this desire of the Society.

"If I attempted, or were competent, to pass in review the work by which J. D. Hooker has advanced botanical science and enriched its literature, the few words I intend to address to you would swell into a biography; for of the sixty years which have elapsed since he entered the service of science, there are but few in which he has not left his mark upon its history.

"The four years which he passed with the Antarctic expedition, and the three years during which he wandered among the ranges

of the Himalayas, were the period in which he saw nature in her most diversified, grandest, and purest aspects, and was brought face to face with the mysteries of the distribution of life over the globe. Then, and for many years afterwards, he made these phenomena and their causes the object of his special study. His writings on the subject have had the most powerful influence on, and were the guide, in all subsequent inquiries. His travels were of the highest importance, and that not with regard to our biological knowledge alone: his intimate acquaintance with geology, meteorology, his proficiency as a surveyor, have rendered his accounts of the countries visited by him equally valuable to the geographer.

“When biology entered upon that eventful period of its history, in which the doctrine of continuous evolution by natural selection was striving to replace that of distinct creations, Hooker was one of the foremost champions of the former. Many systematic workers in zoology and botany were apprehensive at the time of dangers arising to their methods from the new doctrine. Hooker dispelled such fears by his own example; he continued his systematic work, but he showed at the same time that it was not the end, but only the means to the end, of biological research.

“The part which he took, during the lifetime of his father, and during the twenty years of his directorship, in raising the Royal Gardens at Kew to their importance and eminence, is known to all of you. But I cannot pass this short allusion to his official work without referring to the position which Kew has taken as the centre of advice and help for the kindred institutions in India and the Colonies. This bond had been already established by the father; but it was strengthened by the son’s personal acquaintance with their capabilities, and his sympathy with their needs.

“His official duties, sufficiently arduous by themselves, did not prevent him from obeying other demands of science, when he was called upon to perform the functions of President of the British Association in 1868, and of the Royal Society from 1873–1878. And since his retirement from the public service in 1885, at an age when most men seek for rest from their labours, we have seen him still prosecuting his work with that single-minded devotion to science which has been characteristic of the whole of his life.

“The prosperity of the Linnean Society, of which he has been a Fellow since 1842, has always been to him an object of special interest. Some of his most remarkable memoirs appeared in our ‘Transactions.’ Bentham, who devoted years of care to the welfare of the Society, was connected with him by ties of closest friendship. And last, but not least, we remember that in honouring the son we are doing homage to the memories of the father and grandfather, both of whom were illustrious Fellows of the Society.”

Sir Joseph Hooker, in acknowledging the presentation, said :—

“MR. PRESIDENT, I cannot express my sense of the great, the exceptionally great honour which your Council has conferred upon me in the founding and awarding of this beautiful medal. In receiving it, let me assure you that I value it as much for the evidence it bears of the friendly regard of my associates as for their all too high estimate of my endeavours towards the promotion of science. Furthermore, let me say that from no scientific body could it be received by me with more cordial welcome than from the Linnean Society, which was the first to which I have the honour of belonging to enrol me amongst its Fellows, and which especially cultivates those branches of knowledge to which I have devoted the best years of my life. To these considerations must be added what you yourself have alluded to, namely, my hereditary interest in a Society of which my father and grandfather were very early Fellows, and both of them contributors to its ‘Transactions.’ To this latter circumstance it may perhaps be due that I was elected at a very early age, being, I believe, the youngest member of our body, with no further scientific claims or the support of my electors than that I was serving as a naturalist in the Antarctic expedition under Captain Ross, where I happened to be the youngest, as I am now the only surviving officer of those then under the command of that intrepid navigator. I may mention that Captain Ross was himself a Fellow, and had a copy of our ‘Transactions’ in his cabin, which was a godsend to me. I was in the Falkland Isles when my election took place, and nearly a year and a half elapsed before my captain and I knew that we were fellow Linneans.

“In 1842 the Lord Bishop of Norwich was President. He was the first of them under whom I have been privileged to sit. Had the Society adopted the rule of biennial presidents I should have sat under thirty at least, which, in my estimation, would have detracted greatly from the dignity which I attach to the chair, and I venture to think from its utility also. In the year 1842 there were 610 members of the Society (including fellows, foreign members, and associates), with fully one-fourth of whom I soon became personally acquainted. Twenty-eight years afterwards, that is about midway between the former date and the present time, the number of my personal friends in the Society had risen to one-half of the whole body. Our numbers are now 820, but the proportion of my personal friends among them has inevitably shrunk from my having outlived so many associates of my middle age. And this leads me to ask your indulgence for one more egotistical detail. It is that I am perhaps the only Fellow who personally knew four of the 169 naturalists who, 110 years ago, formed the nucleus of our Society. Of these four I knew two during my later teens: they were the Rev. W. Kirby, the author, with Spence, of the immortal ‘Introduction to Entomology’; and Dr. Heysham, of Carlisle, an excellent entomologist and



ornithologist. The others were Aylmer Bourke Lambert, a former President, and the last, as I have been informed, who wore in the chair the presidential three-cornered hat; and Archibald Menzies, who as naturalist accompanied Vancouver in his voyage in the Pacific, and who introduced the *Araucaria imbricata* into England. These all died very near the year of my election.

“Referring now to the progress of the Society in status and efficiency during the years that have elapsed since 1842, the record cannot but be gratifying to its Fellows. Of this the best proofs are the increment in extent and value of its publications, and the interest taken in its meetings. From its foundation up to the date referred to (fifty-four years) eighteen volumes of the ‘Transactions’ in quarto had been published. During the succeeding fifty-four years about double that amount have been produced in the same form, besides fifty-eight volumes of the ‘Journal’ in octavo, which latter was not commenced till 1857.

“Then as regards attendance at the meetings, during the first years of my fellowship it was miserably small. If my memory does not deceive me, I recall a night in Soho Square when only five Fellows supported the President and Secretary. There was a dearth of papers too, and the discussion of such as were brought forward was discountenanced by the chair. All this is now happily a thing of the past, and I should not have alluded to those bad times had not the Society given proof of that inherent vitality which supported it under a temporary depression, and subsequently raised it to its present position.

“It remains, Sir, to thank you cordially for coupling my father’s name with my own in this award, but for which, indeed, I could not have accepted it without a protest. I inherited from him my love of knowledge for its own sake, but this would have availed me little were it not for the guiding hand of one who had himself attained scientific eminence; who by example, precept, and encouragement kept me to the paths which I should follow; launched me in the fields of exploration and research, liberally aided me during his lifetime, and paved for me the way to the position he so long held at Kew with so great credit to himself, and benefit especially to our Indian and Colonial possessions.”

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The obituary notices of deceased Fellows and Foreign Members were laid before the Meeting by the Secretaries, as follows:—

JOSEPH ARMITAGE, son of the late Rev. Francis James Armitage, of Casterton, near Kirkby Lonsdale, Westmorland, was born in 1853, and educated at Rugby, and New College, Oxford, where he took a First Class in Natural Science in 1876 and gained the Burdett-Coutts University Scholarship in Geology in the following year. He studied medicine at St. Bartholomew’s

Hospital, and took his M.R.C.S. and B.M.Oxon. in 1880; he was appointed House Physician at St. Bartholomew's, and Resident Clinical Assistant at the City of London Hospital for Diseases of the Chest. In 1881 he left England and settled in Emu Bay, Tasmania, where he bought land and devoted what time could be spared from his medical practice to his farm. His health gave way in 1896; and he turned homeward, but died at sea on the 23rd Oct. 1897. His opportunities for original work were practically none, but he retained his zest for botany and geology from the early days, when he gained prizes at Rugby in those two sciences, to the last. He was elected a Fellow of the Society on 17th March, 1881, before his departure for Tasmania.

EDMUND JOHN BAILLIE was born in 1852, and on leaving school entered the firm of F. & A. Dickson, of Eastgate, Chester, Seedsmen. Beginning as a junior in the correspondence department, he eventually became its head, then cashier and confidential adviser to the firm, a partner, and finally the managing partner. On the amalgamation of the two firms of Dickson, Mr. Baillie became deputy Chairman of Dicksons, Limited.

He was a successful man of business, but cultivated other spheres of thought and action. He was an enthusiastic disciple and personal friend of John Ruskin, and, at the time of his death, the President of the Liverpool Ruskin Society. For some years he was honorary secretary and treasurer of the Grosvenor Museum at Chester, and an active member of the Chester Society of Natural Science, in whose 'Transactions' was published his work "The City Flora," an account of the plants round Chester. These do not exhaust the number of the institutions in which he was interested; he also belonged to the Royal Horticultural Society, believed in vegetarianism, and had other tastes. He was elected into our Society on 21st June, 1878, and died at his house, Woodbine, Upton, on 18th October, 1897.

JAMES BATEMAN, one of the pioneers of Orchid culture as now practised, and the knowledge of which united in one person the botanist and cultivator, passed away at his house at Worthing, 27th November, 1897, at the ripe age of 87.

Born in the year 1810, he gathered his first orchid, *Orchis mascula*, when a child of eight. At Oxford he seems to have shown his passion for orchids, awakened, it is stated, by a coloured drawing of *Renanthera coccinea*, and whilst still admiring the beauties of that plant, he, as a gentleman-commoner of Magdalen College, incurred the rebuke of the Vice-President, Dr. Daubeny, afterwards Professor of Botany. For having infringed the regulations as to hours, Mr. Bateman was required to write out half the book of Psalms.

He took his degree of B.A., 17th May, 1834, but had been elected a Fellow of the Linnean Society the year before,

19th March, 1833, so that at his death he was the Father of the Society. He proceeded M.A., 3rd May, 1845.

Encouraged by his father, in 1832 Mr. Bateman despatched Colley to British Guiana, chiefly in search of orchids: the expedition was not very successful, *Oncidium Lanceanum* being the most noteworthy result; but to one of the novelties Dr. Lindley gave the name *Batemannia Colleyi*, thus commemorating at once the employer and his collector. Some time after this, Mr. Bateman made the acquaintance of G. Ure Skinner, at that time living in Guatemala, and from him received from time to time consignments of living orchids, which were then distributed among cultivators.

Mr. Bateman's first book was in point of size not only his greatest, but is actually the largest in any purely botanical library. 'The Orchidaceæ of Mexico and Guatemala' consists of 40 elephant folio plates and text, besides woodcuts, two of which were by George Cruikshank, issued at twenty guineas, from 1837 to 1843; the edition was limited to 125 copies. Whilst this splendid but costly work was coming out the author married, his wife sharing his love of plants. Hence the gardens, first at Biddulph Grange and subsequently at Knypersley Hall, became well known for the large number of beautiful and interesting plants contained in them.

The climate of Staffordshire proved unfavourable to the health of Mrs. Bateman, and they removed about the year 1860 to Kensington. The Horticultural Society was then in its palmy days, and Mr. Bateman was in the habit of showing something new or striking at the various meetings. It was at this time that he drew up the text for many of the orchid novelties described in the 'Botanical Magazine,' which were afterwards collected and issued as 'A Second Century of Orchidaceous Plants,' 1864-70; the First Century being by Sir William Hooker. Concurrently with this he produced his third important work, 'A Monograph of *Odontoglossum*,' which, if a smaller folio than his first venture, consisted of half the number of plates. Four parts were brought out, at a guinea apiece, from 1864-70.

From 1862-64 he published in 'The Gardeners' Chronicle' a series of 12 papers, "Dies Orchidianæ," under the pseudonym of 'Serapias,' and in 1864 brought out a 'Guide to Cool Orchid-growing.' In contrast to his fellow orchidists, all his life long he had a great aversion to hybrids, especially artificial hybrids.

About 1885 Mr. Bateman withdrew from London and lived at Worthing, still interested in his plants and ecclesiastical matters; indeed, he is stated for some time to have been editor of the 'Rock' newspaper. One of his last appearances in our midst was to bring up the spadix of a Palm, *Trachycarpus excelsa*, to one of our conversazioni in 1887.

A short time since a small volume of coloured drawings of Orchids was added to the library of the Herbarium at Kew; no name was attached, but from internal evidence it was ascertained that they were the production of our late Fellow.

ISAAC BYERLEY was born in the Isle of Wight, and early moved to Liverpool, where he studied medicine, afterwards completing his course in Dublin and London. Qualifying in 1834, too young to receive his diploma, he took a voyage to the West Indies, and therein cultivated that love of nature which dominated his later life. He started practice at Upton, where he remained in charge of an immense district until 1854, when he removed to Seacombe, on the death of one Dr. Halliday. Meanwhile he had become a Member of the Royal College of Surgeons, England, of which he was made a Fellow in 1857. In 1886 he retired from practice and devoted himself entirely to his long cherished naturalist pursuits and his garden, and with the aid of a faithful servant "Sam" he so developed his estate and its surroundings that they became a local byword, with which he was himself associated as "The Old Duke." While at Upton he became engrossed in the local flora and fauna; and, following the example of his friend the late Dr. Dickinson of Liverpool, he edited a Flora of that district and the neighbourhood, for which he was afterwards awarded the annual Medal of the Kingsley Natural History Society of Chester. His investigations on the banks of the Dee resulted in the discovery of new species of both plants and animals, conspicuously of Crustaceans, and many and amusing are the anecdotes told of his adventures on some of these occasions in company with his friend the late Dr. Higgins, well known in connection with the Liverpool Museum.

He was Surgeon to the Wallasey Dispensary and Seacombe Cottage Hospital, in which he took the greatest interest till his death. He served on the Local Board of Commissioners for public water-supply, and became in due course Medical Officer of Health.

Mr. Byerley was elected a Fellow of the Linnean Society on 18th April, 1854; and died on Sunday, 20th June, 1897, at the age of 83, revered and respected by all about him.

The Hon. Sir WILLIAM LAMBERT DOBSON, K.C.M.G., Chief Justice of Tasmania, was the eldest son of John Dobson, of Hobart Town, and was born in 1833. He was called to the Bar of the Middle Temple in 1856, and to the Tasmanian Bar the following year, became Attorney-General of Tasmania in 1861, puisne judge 1870, Chief Justice in 1865, knighted the following year, and created K.C.M.G. in 1897. He administered the government of the Colony from November 1886 to March 1887, a period of fourteen weeks. He was elected Fellow of this Society on 20th December, 1883, and died on 17th March, 1898.

JOSEPH WILLIAM DUNNING, only son of Joseph Dunning, Solicitor, of Leeds, was born there on 5th November, 1833. He was educated near Huddersfield, at the school of Peter Tuchbald, an enthusiastic naturalist, and young Dunning under his watchful care, while still a schoolboy, rediscovered the *Agrophila sulphuralis*. Leaving school he went to Paris to read with an English

clergyman, and on his return entered at Trinity College, Cambridge, graduating in 1856, and taking his M.A. degree three years later. He in due course became a Fellow and a Tutor of his College. In 1861 he was called to the Bar at Lincoln's Inn, where he attained to high esteem both as a pleader and as an editor of law-books. In October 1890 he had an apoplectic stroke, and from the effects of this he never fully recovered, retiring into private life in 1891. In 1857, when at Cambridge, Dunning was prominent in the establishment of an Entomological Society, in emulation of a similar event which had happened the year before in Oxford; and in 1858 the two Societies combined to produce an 'Accentuated List of British Lepidoptera,' Dunning being responsible for the chief share in the work. He was an excellent linguist and scholar, and highly critical in questions concerning philology, as is proved by his published writings; and his chief paper, dealing with the genus *Acentropus*, shows him to have been capable of doing good work under difficult and highly involved circumstances.

At the age of 16 Dunning joined the Entomological Society of London, and was in 1862 elected one of its Hon. Secretaries, and in that capacity he performed a nine years' service, now memorable in the Society's history. Difficulty, internal dissension, and confusion, under his influence gave place to order and prosperity, the financial position being to a great extent assured by his personal liberality. His interest in the welfare of this Society never waned. He was in 1883-84 its President, and anxious to secure it a Charter of Incorporation; but although this desire was not realized until two years later, he then defrayed the heavy expenses incurred in the transaction. He was a genial, humorous man, endeared to all with whom he came in contact; earnest, enthusiastic, warm-hearted, Dunning remained till the last a true friend of entomologists and a benefactor to their calling. He died on 15th October, 1897, from the effects of a renewed attack of apoplexy. He was elected a Fellow of the Linnean Society on 2nd February, 1860.

JOHN BRAXTON HICKS, second son of Edward Hicks, of Lymington, Hants, was born in 1823, and educated privately. He later became an articled pupil of Dr. Fluder, of Lymington, and at 18 entered as a medical student at Guy's Hospital, London, where he took a series of first prizes in both scientific and professional subjects, adding thereto a medal for double sculling given by the Boat Club. His career at the University of London was no less eventful, since he in 1845 passed with honours the First M.B. Examination, obtaining an exhibition and a gold medal. The final M.B. was in due course attained, also with honours; and he in turn became a Member of the R. College of Surgeons, England, and a Licentiate of the Apothecaries' Company. In 1851 he became an M.D. of London, and eight years later passed the examination for the Membership of the R. College of Physicians

of London, a Fellow of which he became in 1866. He was in 1856 appointed assistant obstetric physician to Guy's Hospital, being in 1868 made full physician and lecturer in that subject, and on relinquishing the more active portion of this task he was in 1883 made consulting obstetric physician. In 1888 he accepted the invitation to become obstetric physician and lecturer at St. Mary's Hospital, and at the end of the term was appointed consulting obstetric physician to that institution also. He was for many years physician to the Royal Maternity Charity, and to the Royal Infirmary, Waterloo Road. He was President and Orator of the Hunterian Society in 1879; and during the years 1872-1876, and again in 1889-1893, served as examiner in Obstetrics to the University of London and the Royal College of Physicians.

Dr. Hicks was a frequent contributor to the pages of numerous volumes and Societies' publications, both medical and scientific, and published papers in Italian, American, and Australian journals. Among his better-known books may be named the 'Combined Internal and External Version,' and (in conjunction with Jas. Samuelson) the 'Earthworm and the Common House-Fly,' and the 'Honey Bee,' well known treatises published in the sixties, some of the illustrations to which were engraved with his own hands. He was from youth an ardent student of nature; and among his scientific papers may be recalled those dealing with the "Eyes of Invertebrata," the "Circulation in the Uterus," and the "Anatomy of the Human Placenta." To the publications of the Royal, Linnean, and Microscopical Societies he contributed numerous papers on both Botanical and Zoological subjects,—ranging from Lichens and Mosses to *Volvox* and the unicellular Algae, Protozoa, and the sense-organs of Insects. Nor was he deficient as a student of and writer upon physiological subjects; while the practical and applied side of his work revealed itself in his invention of several apparatus useful in nursing and conducive to the welfare of the sick. He was the founder of the Lynton Ambulance Centre, and in London delivered lectures to ambulance classes. Pupil of Gull, friend and fellow student of Wilks, Habershon, Cooper Foster, and Daniel Hooper, some of whom shared his early devotion to the study of natural science; amiable, cheerful, methodical, and versatile, always busy, and like most busy men ever ready to assist his fellows, he has left us a brilliant record of noble work largely performed for its own sake. He was in 1862 elected a Fellow of the Royal Society, and was also an Hon. Fellow of the Obstetrical Societies of Berlin, Edinburgh, and Philadelphia, as of the American Gynæcological Society, while but a few months before his death he was made an Honorary Fellow of the Obstetrical Society of London.

He was elected a Fellow of the Linnean Society on 1st June, 1852, and died 28th August, 1897.

One of our most valued Colonial Fellows has passed away in the person of THOMAS KIRK, of Wellington, New Zealand.

He was born at Coventry, Warwickshire, in 1828, and in early life was employed in a large timber-mill in his native town, there acquiring a complete knowledge of the business. In 1865 he emigrated to Auckland, and for several years was Curator and Secretary of the Auckland Museum and Institute; in 1874 he removed to Wellington, having received the appointment of Lecturer on Natural Science at Wellington College, which at that time was affiliated to the New Zealand University. Here he proved his value, and was very successful in training his pupils. When the staff was reorganized owing to the College ceasing its connection with the University, Professor Kirk retired, but soon after was appointed Lecturer on Biology at Lincoln Agricultural College, which position he held until he was appointed Chief Commissioner of State Forests. Upon him devolved the duty of organizing the Forest Department, but it was abolished on a change of Government. The 'Forest Flora of New Zealand' is a testimony to his zeal and knowledge of the flora in question. For many years previous to his death he was engaged on a Student's Flora of the Colony, but although began to print the early part, it proves to be only half completed. The need of such a work is great, and it is to be hoped that his son may be able to complete the father's book.

The reports on the forests under his charge are standard works, and display the early training in timber-knowledge, as well as the later acquired biological and special insight.

He died somewhat suddenly on Tuesday, 8th March, 1898, at Plimmerton, a seaside resort, eighteen miles from Wellington. He had suffered from hepatitis and intercostal rheumatism, but the actual cause of death was the bursting of an abscess on the pleura. He was buried two days after death, in a coffin of polished kauri-wood, his favourite timber. The family left consists of three daughters and two sons, the elder of whom is Government biologist, and the other in the Education Department. Professor Kirk was elected Fellow of the Linnean Society on 19th January, 1871.

CHARLES JOHN LEAF was a member of the well-known firm of drapers and warehousemen, Leaf, Sons & Co., of Old Change, now merged in that of Pawson, Leaf & Co., of St. Paul's Churchyard. He occupied a prominent position among those City men who seek relaxation in the delights of science, and was altogether exemplary among large employers of labour in the extent to which he encouraged a taste for science and literature among his employes. By his influence prominent scientific men of the day were induced to lecture to them, and on their behalf he founded the "Old Change Microscopical Club."

He died on 21st October, 1897. He was a Fellow of the Geological Society and of the Society of Arts, and was elected a Fellow of the Linnean Society 5th on December, 1861.

RUDOLPH LEUCKART, whose name is a talisman in zoological circles, and whose work has marked more than one epoch in the history and development of modern zoology, was born at Helmstädt in 1823. His father was a bookseller in that town, a former seat of one of the prominent Universities of Brunswick, and his uncle, Friedrich Sigismund Leuckart, a zoologist of repute; wherefore it would appear that there was in the family a taste for the study of natural history. Leuckart's memory will ever centre in his famous resolution of the great Cuvierian division 'Radiata' into the Cœlenterata and Echinodermata; a masterly achievement which, with its correlated recognition of the Vermes, Arthropoda, Mollusca, and Vertebrata, furnished the key-stones in the fabric of the Zoological system still in vogue. All this was set forth in the pages of the 'Morphologie und Verwandtschaftsverhältnisse der wirbellosen Thiere,' published in 1848. To have thus revolutionized an entire branch of science at the early age of 25 was to have given proof of genius, and the event came before the world a fitting sequel to the fact that its author while still a student had completed the 'Lehrbuch der Zootomie' of his teacher Rudolph Wagner; and as early as 1847 had published, in conjunction with Heinrich Frey, the ever noteworthy 'Beiträge zur Kenntniss der wirbellosen Thiere.'

On the completion of his student career at Göttingen, Leuckart was made Assistant in the Physiological Institute of that University. In 1850 he was appointed Professor Extraordinarius of Physiology at the University of Giessen, the fame of which was then, through the genius of Liebig, resounding throughout the Fatherland. He was in 1855 promoted to the office of Ordinary Professor, and in 1870 he was transferred to Leipzig, where, as Professor of Zoology and Zootomy, and Director of the Zoological-Zootomical Institute and Museum, he worked out the later triumphs of his career. Among the topics with which his name will be ever memorably associated, there may be mentioned that of division of labour in the animal kingdom, of the developmental processes in the Apidæ and in the Cephalopoda, of the recognition of the osphradium in certain Mollusca, and of the determination of the molluscan affinities of *Neomernia*, all highly technical, and each productive of far-reaching results. Great as were Leuckart's powers of research, and inspiring his discourses, his erudition and literary resources, begotten of intense devotion and close application to his calling, were no less remarkable. Witness his Editorship of the 'Bibliotheca Zoologica,' and the long series of summaries of contemporary research which he year after year contributed to the pages of Wiegmann's Archiv; and—more popular among his numerous writings—his standard



'Menschlichen Parasiten,' the first volume of which has been translated into English. Cyclopædic in its contents, this work is at the same time the embodiment of years of laborious experimental observation, in which he himself determined the life-history and hosts of by far the greater majority of cystic worms then known, to say nothing of other parasites. And witness the old Brunswicker at the age of 60, working out, contemporaneously with A. P. Thomas, the life-history of the Liver-fluke, that foremost piece of British Helminthology! Nor must his 'Zoologische Wandtafeln' be forgotten, by way of a sustained effort in the cause of scientific education.

During the 48 years of his active life there emanated from his pen a continuously flowing series of some 200 monographs and papers, all of which are important and have borne the test of time. A few of these are in English and were published in our own scientific journals, his association with us dating from 1848, when, in conjunction with his teacher Rudolph Wagner, he contributed an article to Todd's 'Encyclopedia of Anatomy.' The contemporary of Huxley, Lovén, Kölliker, and Gegenbaur, a man who lived through the Darwinian epoch, the teacher of Alexd. Brandt, of Bütschli, Hatschek, Korschelt, Mark, Rabl, Salensky, Simroth, and Whitman, zealous, persistent, painstaking, and unostentatious, a continuous worker, a profound philosopher, content could he but unfold the pages of Nature, he has passed away, leaving a name which will be ever venerated by zoologists and all earnest workers in science, a noble example for the rest of time.

He was in 1877 elected a Foreign Member of both the Royal and Linnean Societies, and in 1883 received corresponding recognition from the Zoological Society.

DON JOSÉ CAMILLO LISBOA was born about 1822, and an early pupil of the Grant Medical College, Bombay. After a long and successful medical career, he retired from practice to devote his leisure to botanical pursuits, especially the grasses of Bombay. Part of his list has already appeared in a Bombay journal, and the remainder is stated to be in the press. He was elected into the Linnean Society, 6th Dec. 1888, and withdrew in 1893. Subsequently he again was elected, on 15th March 1894. He died at Poona, 1st May, 1897, aged 75.

SIR JAMES RAMSAY-GIBSON-MAITLAND, 4th Baronet, was born on the 29th March, 1818. He was fourth in descent from the Hon. Alexander Maitland, the fifth son of Charles, 6th Earl of Lauderdale. He was educated at St. Andrew's University and at Sandhurst, and in 1867 received a commission in the 4th Dragoon Guards, but only remained for a short time in the Army. Subsequently he was a Captain in the Highland Borderers Militia.

In 1869 he married Frances Lucy Fowke, the youngest

daughter of Sir Thomas Woollaston White, Bart., of Wallingwells, Notts. She took much interest in natural science, and more especially in bird-life and in geology.

James Maitland's attention was turned to fish culture by Frank Buckland in 1873, and in the latter part of that year he began operations on a burn in his father's property of Sauchie near Stirling. He first made a box on the plan recommended in the 2nd edition of Francis Francis's 'Fish Culture.' He then got some slate trays on which to hatch trout ova, and he built a plank pond, 9 ft. long, 2 ft. 5 ins. wide, and 1 ft. 2 ins. deep (outside measurements). During the winter he found frost a trouble, and consequently in 1874 he built a hatching-house. During the same season, 1874-75, he made a pond near the burn which flows from Loch Coulter to the Bannockburn. The site selected was close to a disused water-mill, and was known as the Howietoun. It was admirably adapted for fish-culture: year by year ponds were added, and the whole establishment received the name of the Howietoun Fishery.

It is interesting to note at what an early period Maitland struck out on the lines upon which he was to work to the end. The rectangular plank pond was followed in 1874 by very similar plank-ponds, 20 ft. long and 2 ft. deep, and in 1887 by others 130 ft. long and 7 ft. deep; and even when the ponds had earth or rock sides, the rectangular ground-plan was nearly always retained though the sides sloped to the bottom instead of being perpendicular.

Then the leaf-screen and the safety-screen were invented by Maitland for the 9 ft. plank-pond, the former of which is practically the same as the leaf-screen now used for the intake at Howietoun, and safety-screens are fitted to every box in the hatching-houses.

From the first, too, he realized that his ponds must be so constructed that fish could neither get in nor out, and the inlet and outlet consequently received special attention; and in order to avoid any possibility of flood, the ponds were placed a little out of the course of the stream, and were well protected by an overflow above them. Maitland at a very early period realized the importance of the production of ova from carefully selected breeders, and was the first carefully to rear a stock of eight- or nine-year-olds in order to breed from them.

His original stock of breeders was raised from eggs taken at Lochleven in 1874 and 1875, and from some eggs of the trout of the burns on his father's Sauchie Moor, which were laid down in the latter year. As the fish grew older he found that the size of their eggs increased and that the fry from them were each season bigger and stronger, and he thus came to the conclusion that the ova of old trout were the most valuable.

After the first year or two he used a form of glass grille invented by himself on which to hatch his ova, for though they are rather expensive and take up a good deal of space, he

said his object was to incubate ova so as to produce the largest possible number of healthy and satisfactory fish, and not merely to hatch the largest possible number of eggs in a given space.

In 1881 he published a pamphlet on 'Stocking Waters, Formation of Redds,' &c., and an Essay on the Salmon disease.

Sir James Maitland obtained a gold and a silver medal for fish-culture at the Edinburgh Fisheries Exhibition of 1882, and a gold medal from the Société d'Acclimatation, Paris. In the following year he obtained several awards at the International Fisheries Exhibition in London, and he read a paper at a conference at that exhibition, which was published under the title 'On the Culture of Salmonidæ and the Acclimatization of Fish.'

Sir James devoted much attention to the transport of both ova and live fish, and attained great success. In 1881 he interested himself in the transport of salmon and trout ova to the Antipodes, and in December of that year he despatched a consignment to New Zealand. It was not successful; but after one or two other attempts success was achieved, and the problem once solved, he found very little difficulty in sending live ova to that or any other part of the world. The Government of New Zealand presented him with a pair of silver vases in recognition of his services.

The ponds at Howietoun are admirably adapted for experiments in hybridization, and Sir James obtained many results of great interest, which have been to some extent described in papers and in his 'British Salmonidæ' by the late Dr. F. Day, who first visited the Howietoun establishment in 1882 and took great interest in it till his death. The cross between the Lochleven trout and the American charr (*S. fontinalis*) has turned out a beautiful fish, and has been used to some extent for stocking waters.

The question of breeding from salmon that were not allowed to visit the sea also aroused Sir James's interest, and a paper on one of his salmon by Dr. Day is published in the Linnean Soc. Transactions, Ser. II. ii. (1885) pp. 447-468, tt. 53, 54.

One of the salmon, from ova obtained from the Forth District Board in December 1880, and reared in the Howietoun ponds, spawned three seasons, and was found in the first week of November 1888 to be clean. It weighed just under three pounds, and was very silvery, with about 30 jet-black star-like spots. The flesh cut pink, and the flavour was like that of a fish a week in fresh water. The smolts and grilse bred from these fish grew more rapidly than the parents.

In 1887 Maitland published the first part of 'The History of Howietoun.' The volume contains the history of the Fishery from its commencement in 1873 to the middle of the year 1879, and it was intended that a second volume should complete the story up to 1887. A part of this was written and some illustrations were prepared for it, but it has not been completed. A fourth edition of his pamphlet on stocking rivers with

Salmonidæ appeared in 1892. It was almost entirely rewritten, and is practically a new work.

Sir James served on the Forth District Board and on the Fishery Board for Scotland. He was a J.P. and D.L. for Stirlingshire, and a J.P. for Midlothian. For some years he was the Convener of the County of Stirling, and when by the Act of 1887 County Councils were established in Scotland, he became Chairman of the Stirlingshire County Council, and continued to hold that office until his death.

He built a new mansion house on the Sauchie estate and named it Sauchieburn, and he, with his wife and daughter, moved into it in the summer of 1893. Lady Maitland died on March 17th, 1896, and her death was felt as a very severe loss by her husband.

Sir James died at Sauchieburn, of heart disease, on Tuesday, 9th November, 1897. He leaves an only daughter, who succeeds to his estates.

He was a Fellow of the Zoological and Geological Societies, and was elected a Fellow of the Linnean Society on 15th June, 1852. [H. W. M.]

THOMAS JEFFERY PARKER, D.Sc., F.R.S., eldest son of William Kitchen Parker, was born in London on October 17th, 1850. As a boy he showed more taste for literature and art than for science, and was not, like his father, a born naturalist. On leaving school he entered as a student at the Royal College of Chemistry and Royal School of Mines, where he came under Professor Huxley's influence; and when the latter migrated to S. Kensington and began to organize practical courses, he offered the post of Demonstrator in Biology to Parker.

The working out of Huxley's splendidly conceived plan of practical teaching was left largely in Parker's hands, and how successful he was in this task can only be appreciated by those who studied under him, many of whom now hold important scientific positions in various parts of the world. The whole course, in fact, set an example which has since been widely followed, both in this country and abroad.

In the intervals between the courses Parker gradually organized a Teaching Collection, and also made a number of exquisite dissections of various types of animals, and prepared drawings of them. In this work he was subsequently most efficiently aided by Mr. (now Professor) G. B. Howes, who, in addition to making dissections, prepared the now well-known series of coloured laboratory drawings which adorn the walls of the Biological Laboratory at S. Kensington, and copies of which were afterwards furnished to most of the Universities and Colleges in the United Kingdom and to others in America and on the Continent. These were at first based upon Parker's originals; but subsequently the series was enlarged and improved upon by Howes, who utilized some of them in the preparation

of the 'Atlas of Elementary Biology,' published by him in 1885. Parker's original researches during this period were undertaken entirely on his own initiative, and, in addition to several original papers, he wrote a number of more popular articles in the 'Nineteenth Century' and elsewhere. In 1879 he became one of the Assistant Editors of the Journal of the Royal Microscopical Society, and the same year held the Lectureship in Biology at Bedford College.

In 1874 Parker married Charlotte Elizabeth Rossell, daughter of the Rev. John Rossell, and on his appointment to the chair of Biology at the University of Otago in 1880, left England with his wife and two-year old son for Dunedin. A number of lectures and addresses on biological and educational topics which he there delivered show that Parker possessed a marked power of exposition, combined with literary facility, quiet humour, and common-sense views on educational questions. In connection with his University his interest was not limited to his own department, and to him is largely due the credit of introducing many improvements in its Degree regulations. He was a strong advocate of higher educational aims, and lost no opportunity of insisting on the importance of post-graduate study.

The duties of the Professor of Biology at Dunedin include the Curatorship of a large and important University Museum, and in this work Parker showed exceptional talent. In addition to arranging the collection so as to make it educational in the highest sense, he introduced several new methods, amongst which may be mentioned his mode of preparation of cartilaginous skeletons so that they can be mounted dry without shrinkage. Specimens of his efforts in this direction may be seen in the British Museum at S. Kensington; and records of some of his Museum work were from time to time published in 'Nature' under the title "Notes from the Otago University Museum."

Although Parker's time for research was strictly limited he had published, since leaving England, some thirty papers dealing with a variety of zoological subjects. Amongst the more important of these may be mentioned those on the development of *Apteryx* (Phil. Trans.), and on the *Dinornithidæ* (Trans. Zool. Soc.), as well as others on *Palinurus*, *Mustelus*, and *Regalecus*. All these papers are characterized by thoroughness of observation, clearness of style, and extreme caution as regards generalization, and most of them are illustrated by numerous original drawings.

Throughout his career at Dunedin Parker acted as Professor of Biology, but although mainly a zoologist, he did not neglect the botanical side of the subject, and published a paper or two dealing with plants, in one of which he announced the discovery of sieve-tubes in an Alga (*Macrocystis*). He also attempted to secure a greater uniformity of terminology in Biology. Several of his pupils undertook research on his instigation.

Before leaving England Parker had in preparation his 'Course

of Instruction in Zootomy (Vertebrata),’ which was published a few years later; but his power as an expositor of his subject can best be judged by the ‘Lessons in Elementary Biology,’ which is now in its third edition, and which has been translated into German. His literary ability is perhaps even better seen in the charming biographical sketch of his father (1893).

Parker’s affectionate nature and charm of personal manner endeared him to a wide circle of friends, and amongst his students he was a general favourite. His unassuming character and his literary, artistic, and musical tastes resulted in a wide sympathy with all sorts and conditions of men, and he took an active part in the social life of Dunedin.

The gradual decline of his wife’s health did much to sadden many years of Parker’s life, and some little time after her death symptoms of an organic ailment became apparent, from which he eventually succumbed. In the autumn of 1892 he paid a visit to England, and had the great delight of spending a few days with his old chief, Huxley, at Eastbourne.

Parker’s last completed piece of work was the large ‘Text-book of Zoology,’ written in conjunction with Professor W. A. Haswell: this was begun in 1892, and though all the proofs were corrected before his death, he did not live to see it published. The original plan of this beautifully illustrated book, the clearness of the well-balanced descriptions, as well as of the parts dealing with the more general aspects of the subject, place it in the front rank of elementary zoological text-books. A shorter form of this work was also in preparation at the time of Parker’s death, and he had nearly completed half the manuscript of a new ‘Biology for Beginners.’ He had also begun, in conjunction with Mr. J. P. Hill of Sydney, an investigation on some Emeu chicks, and had already obtained interesting results.

In the summer of last year he was prostrated by a second attack of influenza, and this was followed by serious symptoms. At the close of the session, in October, he left Dunedin for a rest and change, but never reached his journey’s end, and was forced to return by easy stages. Arrived at Warrington he gradually sank, and died on Nov. 7th. His unexpected death at the age of 47 is a severe loss to Biological science in the Antipodes.

He was elected an Associate of the Linnean Society on 15th January, 1880, and a Fellow on 2nd December, 1897, the news of his death being then unknown in England. [P. W.]

The Rev. CHARLES WILLIAM PENNY was born at the Rectory, West Ilsley, Berkshire, in the month of December 1837. His father, the Rev. Charles Penny, D.D., was for many years Head Master of the Crewkerne Grammar School, and Charles William was educated under his father, and lived at home until he went to Oxford. He gained an exhibition at Corpus Christi, Oxford,

and in 1860 took a first in final Mathematical Honours—B.A. and M.A. 1861. In 1861 he was appointed one of the Assistant Masters at Wellington College, and soon afterwards became the tutor of the Anglesey Dormitory.

He was ordained Deacon in 1862 and Priest in 1866 by Samuel Wilberforce, Bishop of Oxford. He devoted himself from the first to the study of the flora and entomology of the neighbourhood, and was one of the most energetic members of the Wellington College Natural History Society (now the Natural Science Society). The list of plants found in the neighbourhood of the College, and published in the Reports of the Natural Science Society under the heading "Flora Wellingtonensis," were largely the result of his labour, and bear striking testimony to his great energy and industry, especially when we remember that he was engaged in the arduous work of Bursar Form-Master or Tutor.

In 1867 he became Secretary to Dr. Benson (the late Archbishop of Canterbury), who was at the time Head Master of Wellington, and from 1869 to 1880 he filled the post of Bursar to the College. In the latter year he found it necessary, owing to ill-health, to resign the appointment, and he took one of the College Houses, which he held for 11 years. He left Wellington in 1891, and from that time till his death lived at Wokingham.

Mr. Penny was President of the Natural Science Society from May 1871 to October 1876. He contributed information for Mr. Britten's Berkshire List of Plants, and is appreciatively mentioned in Mr. Druce's recently published 'Flora of Berkshire.' He also took considerable interest in the insects of the neighbourhood, more especially in the spiders, and made at least one addition to the list for Britain (Report Well. Coll. N. S. S. 1879, p. 67).

He died at Wokingham on 30th March last, and is buried there in the churchyard of St. Paul's. His collections of plants and insects are in the Wellington College Museum.

Mr. Penny was elected a Fellow of this Society on 7th November, 1872, but did not contribute to our publications. [H. W. M.]

ALFRED GEORGE RENSHAW died unexpectedly at Svenningdal, Norrland, Norway, on the 14th July, 1897. He was an enthusiastic observer and lover of nature, having a special leaning towards botany and ornithology, and was a collector of books. He is best known in association with literature as editor of Belt's 'Naturalist in Nicaragua.' His name is a talisman in European travelling circles, as that of a founder and main supporter of the Norway Club. His bright demeanour and enthusiastic interest in a wide series of subjects combined to make him a most agree-

able companion. His loss will be deeply mourned by a wide circle of friends.

He was elected a Fellow of the Linnean Society in March 1888.

FERDINAND GUSTAV JULIUS VON SACHS was the third son of Graveur Sachs, and born at Breslau on 2nd October, 1832. Even whilst a child he was passionately devoted to the study of plants and their cultivation, in companionship with the two sons of J. E. Purkinje. In 1848 he lost his father by apoplexy, and a few months after, by cholera, he lost his mother. Thus thrown upon his own resources, young Sachs endeavoured to maintain himself by lithography and painting, but discouraged by his poor success, had determined to become a sailor, when he was invited by Purkinje to take up his abode in his house at Prague as his assistant. This enabled him to complete his course at the Gymnasium, and in 1851 he was a student at the University of Prague, where he attended lectures on botany by Kosteletzky and Willkomm. During his six years' sojourn with Purkinje young Sachs published nearly a dozen papers in the Bohemian journal 'Ziva'; his first German paper came out in 1855 in the 'Botanische Zeitung,' on *Collema*, in which he gave a foreshadowing of the now accepted duality of lichen-life.

In 1856 Sachs received his degree, but his dissertation on Diffusion is stated not to have been published. In 1859, on the recommendation of Hofmeister, Sachs was called to Tharand as assistant to Prof. Stöckhardt, and there continued his experiments on water-cultures which he had started in Prague, and afterwards turned to such striking account.

Early in 1861 he was made chief of the experiment station at Chemnitz, but before entering upon his duties there, he accepted a post in the agricultural academy at Poppelsdorf. During his stay at this place he married an Austrian lady, whose income supplemented his own slender stipend of 700 Thalers or £105 sterling.

From this period must be dated some of his most important work upon what is now termed metabolism, influence of light and temperature on plant-functions, prompting the idea that the true organs of assimilation must be sought for in the chloroplastids. In 1865 appeared his 'Handbuch der Experimental-Physiologie der Pflanzen,' being the fourth volume of Hofmeister's 'Handbuch der Physiologischen Botanik.'

De Bary left Freiburg-im-Breisgau for Strassburg in 1867, and Sachs was selected to succeed him; one year later succeeding Schenk at Würzburg. Here he found himself in congenial environment, his wanderings ceased, and here he remained to the close of his life, although he had tempting offers of advancement from Jena, Heidelberg, Vienna, Dorpat, Berlin, Bonn, and Munich.

It was during the first year of his work at Würzburg that



his renowned 'Lehrbuch' appeared; although a work of such magnitude, embodying such an amount of research, it was the outcome of many strenuous years' application. A second edition was called for in 1870, a third in 1872, a fourth (and last) in 1874. He resisted all importunities to revise it again, as it has "ceased to represent his ideas." Nevertheless its influence was immense, and in its translation it has become a classic of reference. The accumulation of facts and references which are so marked a feature of the 'Lehrbuch' had become distasteful to the author, who preferred to concentrate his attention on a more artistic presentation of particular sections.

Resuming his researches in Würzburg, he began his 'Arbeiten des botanischen Instituts in Würzburg,' the first volume appearing in 1871, the third and last in 1888, nearly coinciding with his withdrawal from active work. In 1875 he brought out his 'Geschichte der Botanik' from the 16th century to 1860: a characteristic but unequal work. His next volume was his 'Vorlesungen' in 1882, the second edition in 1887, which, like his 'Lehrbuch' and 'Geschichte,' are known also in their English translations.

His published works give but a poor idea of his influence as a professor; his conception of a teacher was high, the function of teaching supereminent. His pupils, who were limited in number, and only charily admitted into his Institute after testing, were destined to carry his ideas and methods of work into distant parts, and to the haven thus disseminated must be attributed much of the present aspect of botany as now taught.

For the last 15 years of his life his scientific work was interrupted by long illness, and on 29th May, 1897, after six weeks' acute phthisis following influenza, he quietly passed away at Würzburg.

He was elected Foreign Member, May 1878; ten years later on the similar list of the Royal Society. He travelled but little, soon wearying of the unaccustomed sights and sounds, and uncontrollably drawn back to his beloved pursuits. His old colleague Prof. Goebel in 'Flora' gives a list of 99 papers from Sachs's pen, besides the independent volumes which are mentioned in the foregoing account.

WILLIAM SCOTT was born at Lomnay, Aberdeenshire, on 12th September, 1859, and was apprenticed as gardener at Aden House. After passing through two other garden establishments in Scotland, he came to the Royal Gardens, Kew, whence, in 1881, after six months' service, he was appointed assistant to Mr. John Horne, then head of the Mauritius gardens and forest department. On his chief completing his term of service in 1890, Mr. Scott succeeded him, with the three gardens under his charge at Pamplemousses, Curepeep, and the private garden of the Governor's house at Redway. These gardens suffered in 1892 terrible losses by a hurricane, which it is stated stripped every

leaf. Mr. Scott proved himself an active and diligent official, especially in promoting planting of suitable trees in forests in the comparatively denuded parts of the island, and the amount of available timber is greatly increased by his exertions. On leaving for a furlough in this country, he was presented with an address from his staff at Pamplemousses, and on his reaching home in September last he presented the picture of health. Shortly afterwards he made a tour in the West Highlands, but on ascending Ben Nevis, too late in the autumn, he took a severe cold, which, complicated by an attack of fever, produced pneumonia, under which he rapidly sank, and passed away at Stirling on 3rd October, 1897. He was elected a Fellow of this Society so recently as 19th December, 1895.

JOHANNES JAPETUS SMITH STEENSTRUP was born at Aalborg, in the district of Thy, North Jutland, on March 8, 1813. His father was a parson and educated his son at the Cathedral school, and afterwards at the University of Copenhagen. A desire for the study of nature appears early to have revealed itself, and it was at first cultivated under the fostering care of an uncle, a gifted parson and pupil of Melchior. Schouw, the elder Reinhardt, Drejer, and Liebmann were among Steenstrup's early friends, and it is said that of these Reinhardt, by his lectures, made an ineffaceable impression on his mind. Gifted as a student alike of all branches of Natural History, Steenstrup, early in his career, entered also the historical field, publishing essays upon 'Ottar's relation to King Alfred on his travels in Northern Seas, and on the passage of King Harold through the Limfjord'; and his archæological leaning, always strong, reasserted itself after his retirement from active professorial work in the eighties, in the production of important monographs at the advanced age of more than 70 years. In 1839 he was sent by the Government to Iceland in company with Schytte, the chemist, and during the exploration of that country he did memorable work upon the fossil plants and volcanic formations. While on the journey he made some observations upon the metamorphosis of the Crabs which lie at the foundation of our knowledge of Crustacean development, with which subject his name will be ever historically associated. And in the fuller working out of the materials obtained on this noteworthy expedition, the names of Rathke and Oswald Heer stand conspicuous.

In 1841, shortly after his return from Iceland, Steenstrup was appointed lecturer in Botany and Geology in the Seeland Academy of Soroc, and it was then that he contributed his famous essays on 'The Alternation of Generations' and 'Hermaphroditism in Nature,' by which he attained a world-wide reputation, the former being now a classic, and even today the subject of frequent citation and criticism. Beyond these epoch-marking essays, Steenstrup is best known as the master of Cephalopod morphology; his system, collections, and writings rank foremost

among those of specialists in this department, while to the lay mind he will remain famous as the man who unravelled the mystery of the 'Sea Monk' (*Architeuthis*). In other departments of marine zoology he has left a mark upon time. His work upon the hectocotylus, the marine annelids, crustaceans, and fishes, his observations and novel ideas concerning the translocation of the eyes in the flat-fishes, are all of prime importance; and equally interesting historically is perhaps the fact that by early using his influence with mariners, inducing them to utilize their leisure hours in collecting and making notes and systematic observations upon the surface-fauna, he stands out a pioneer in oceanology, and what we now term 'plankton' exploration. Nor was he unwilling to risk reform; as in his novel interpretation of the Brachiopoda, and his argument that the "Operculate Corals" may be non-Anthozoa and perhaps allied even to these, if not to the Serpulidæ or Hippuritidæ. But while the bulk of his work on the Zoological side dealt with the Invertebrata, apart from his investigations upon the morphology of fishes, we find him during his residence in Soroe making important observations upon the Ranidæ, which today receive expression in our synonymy; and while reptiles fell within his palæontological studies, and mammals within both these and his strictly zoological, the migration of birds furnished material for one of two prize essays during the forties and the early part of his career.

In 1846, on the death of the elder Reinhardt, Steenstrup became Professor of Zoology at the University of Copenhagen, and Director of its Zoological Museum. While there he took a leading part in the work of the Royal Society of Science, of which he was Secretary, and of the Natural History Society, refusing the Presidentship of the former and the Rectorship of the University in order the better to devote himself to pure science and professorial duties. He was, in 1848, with Forchammer, put in command of the "Royal Natural History Museum," which, after years of turmoil and official opposition, he was mainly successful in replacing in the building which now stands in the grounds of the University, a monument to his memory.

Steenstrup, as friend, teacher, and worker, is said by those who knew him to have realized the very ideal of human desires. He was honoured by the highest distinctions which his country could confer, as with others by the leading scientific bodies of Berlin, Christiania, London, Paris, and Stockholm. Equally profound as zoologist, botanist, and geologist, as historian, antiquarian, archæologist, a man of mark, he has set us a splendid example of excellence and of prolonged and disinterested devotion to science for its own sake, and with his decease a link with the historic past has been lost.

He was elected a Foreign Member of the Royal Society in 1863, of the Linnean on 5th May, 1864, and of the Zoological in 1879, and died at Copenhagen, 20th June, 1897, aged 84.

ROBERT WARNER died at his residence, Widford Lodge, Chelmsford, on 17th Dec., 1896, aged 81; he was therefore born about 1815. He was a zealous cultivator of Orchids, and his chief productions, 'Select Orchideous Plants,' 1862-91, three series, fol., and the 'Orchid Album,' 1882-97, eleven vols., 4to, testify to his enthusiasm for that order of plants. In gardening circles he is well remembered for having taken fifty large specimens to a horticultural exhibition at St. Petersburg in 1869; the journey thither lasted twenty days, but the plants arrived uninjured. *Cattleya Mossiæ* is stated to have been his favourite flower, and he possessed a large number of the species and varieties. It is therefore appropriate that another member of the genus should bear his name, *Cattleya Warneri*, T. Moore; although botanically now merged in *C. labiata*, gardeners are very prone to retain old names in use.

Mr. Warner was elected Fellow on 19th February, 1894.

June 2nd, 1898.

MR. ALBERT D. MICHAEL, F.Z.S., F.R.M.S., Vice-President,  
in the Chair.

The Minutes of the last Meeting were read and confirmed.

Messrs. Ernest Charles Horrell and George Nicholson were admitted, and Mr. Eugene Frederick Augustus Obach was elected a Fellow of the Society.

The Chairman announced that the President had appointed Mr. William Carruthers, Mr. Frank Crisp, Mr. Albert D. Michael, and Dr. Dukinfield H. Scott to be Vice-Presidents for the ensuing year.

The following papers were read:—

1. "Notes on Lories." By Dr. St. George J. Mivart, F.R.S., F.L.S.
2. "A Revision of the Genus *Symblepharis*." By E. S. Salmon. (Communicated by E. M. Holmes, F.L.S.)
3. "On the Food of the Uropoda." By Surg.-Capt. H. Cummins, F.L.S.
4. "Observations on the Subdivision of Biologic Areas in India." By Charles Baron Clarke, F.L.S.

June 16th, 1898.

Dr. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Messrs. Eugene F. A. Obach and Selmar Schönland were admitted, and Messrs. Charles Chamberlain Hurst and William Toogood were elected Fellows of the Society.

Prof. J. B. Farmer, F.L.S., and Mr. W. G. Freeman, F.L.S., demonstrated the action of germinating peas, cress, and barley in causing the deoxidation of a watery solution of methylene blue to a colourless liquid on shaking up the latter with air, while on adding a drop of hydrogen peroxide the blue colour was restored. Green plants placed in the solution were found to act in a manner precisely similar to the seedlings, though the action may be modified by assimilation in sufficient light. A number of experiments were shown.

A discussion followed, in which Mr. A. W. Bennett, Prof. Howes, and Mr. Thomas Christy took part.

Mr. F. Enock, F.L.S., exhibited and made remarks on the eggs of an Hemipterous insect containing living parasites (*Prestwichia aquatica*), of whose life-history and habits he gave a detailed account.

Prof. Herdman, D.Sc., F.R.S., exhibited some dissections, microscopic preparations, and drawings to illustrate the presence of modified pedal muscles in the Oyster. It was shown that there was reason to believe that these muscles, the insertion of which into the shell had been noticed in the American Oyster by Ryder and Jackson, were the representatives of the *protractor pedis* of other Pelecypoda. But, as the oyster has no foot in the adult, the muscles have been modified in their distribution and have acquired a new function. The fibres can be traced in sections to the external (anterior) lateral palps and to the anterior end of the external gills; and experiments and observations upon the living animals show that the action of the muscles in question, when the oyster opens its shell for the purpose of feeding, is to draw the anterior palps and the external branchiæ forwards and outwards, and so open up more widely the ciliated food-avenue on each side which leads to the mouth.

Some remarks were made by the Rev. T. R. R. Stebbing.

The following papers were read:—

1. "Observations on the Seasonal Variations of Elevation in a Branch of a Horse-Chestnut Tree." By R. Miller Christy, F.L.S.

2. "On *Pantopoda* collected by Mr. W. S. Bruce in Franz Josef Land." By G. H. Carpenter, B.Sc. (Communicated by W. Eagle Clarke, F.L.S.)

3. "Morphological Relationships of the Actiniaria and Madreporaria." By J. E. Duerden. (Communicated by Prof. G. B. Howes, Sec.L.S.)

4. "On some Fossil Leporines." By Dr. Forsyth-Major. (Communicated by Prof. G. B. Howes, Sec.L.S.)

June 30th, 1898.

DR. ALBERT C. L. G. GÜNTHER, F.R.S., President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Mr. Henry George Flanagan was elected a Fellow of the Society.

The Meeting having been declared special for the election of a Councillor in the place of Mr. Osbert Salvin, deceased, the President announced that a ballot would be taken to fill the vacancy thus caused, and would remain open till half-past eight o'clock.

The following papers were read:—

1. "A Revision of the Genus *Elæocarpus*, Linn." By Sir D. Brandis, K.C.I.E., F.R.S., F.L.S. [In Abstract, see Appendix, No. 2.]

2. "Observations on the Membraniporidae, a Family of Marine Bryozoa." By A. W. Waters, F.L.S.

3. "On the Fruit of *Chnoospora fastigiata*, J. Agardh." By Miss Ethel S. Barton. (Communicated by George Murray, F.R.S., F.L.S.)

The President made remarks on some of the larger Tortoises recently examined by him in the Paris Museum.

The Ballot for a new Member of the Council having been closed, the President appointed Mr. A. Smith Woodward, Mr. Arthur Lister, and Mr. W. Lindsay Brown, Scrutineers, and the votes having been counted and reported to the President, he declared Mr. W. Percy Sladen to be duly elected.

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## APPENDIX. No. 1.

THE following correspondence has on more than one occasion been mentioned at meetings of the Linnean Society, the latest being 16th Dec., 1897. The whole transaction being connected with the early history of the Society, makes it worthy of being printed here. Camper was elected one of the first Foreign Members, but declined it in the letter which heads the correspondence. [B. D. J.]

(Copy.)

The Hague, June 22, 1788.

SIR,

The proposal you forwarded me within your moste respected letter dated London the 12th surprised me very much. I should esteem it to be a great favour to be one of the four Honourable Members of a Society for the prosecution of Natural History settled in your Metropolis. But it would do me little honour, I fancy, to be it of a *Linnean Society* whatsoever. I look upon Linneus as a mere Catalogist, and the most superficial Naturalist I ever knew. He did in this century little honour to that science. His sexual system of Botany however has some merits, tho' not new.

To return to your proposal; I must beg leave to thank you, and the Right Honourable members of that Society for the honour they intended to confer upon me, having not the least inclination to bear a title of the Swedish author, tho' universally accredited by the Natural Historians of Europe in these days.

As I have given myself great pains on Quadrupeds, Birds, Amphibious Animals and Cetaceous fishes, I discovered every day his errors and his unpardonable ignorance. In Botany the pompous Greek titles of his Classes, Ordines, &c. impose upon the ignorants. But consider the Cryptogamia and you'll confess that his key to put plants under theyre proper ranks to be useless for more than the half part of vegetables.

I love Great Britain, and indeed I love it too much to suffer the name of the well merited Ray or R. Hook to be effaced by that of Linneus. Mr. Pennaut is superior to the Swedish naturalist, tho' likewise superficial and defective.

Why cannot the new Society be entitled for the prosecution of Natural History? or of the *Naturae Curiosorum*? of the *Naturforschende Freunde* as in Berlin? Why not the London Society for Natural History? or any other except that of Linneus?

I am very glad you have been so kind as to recall your name to my mind, nothing could be more flattering for me, than to deserve your esteem, and that of my dear friend Dr. Thomson, of whom I have heard nothing since I left England two years ago, tho' I have sent him severall anatomical observations and figures

from Harwich (I read it so) about which I never have as yet got any answer from him. Be so kind as to put him in mind that I long very much to get some information from him about his occupations &c.

Thanking most respectfully for the honour you intended for me, I subscribe myself with the most perfect consideration,

Sirr, Your most obedient Humble Servant,

PETRUS CAMPER,

Member of the Council of State at the Hague.

To Dr. J. E. SMITH,

Great Marlborough Street, No. 12,

London.

(Copy of letter in Sir J. E. Smith's handwriting.)

MR. PETRUS CAMPER, Memb. of the Council of State, at the Hague,

July 21 [1788].

SIR,

I am honr'd with your letter of the 22<sup>d</sup> June, & should have answered it immediately had I not been ill.—You will pardon me for troubling you again before I lay the contents of y<sup>r</sup> letter before the Soc<sup>y</sup>. Having been the sole proposer of you to the Soc<sup>y</sup> and my choice having been very handsomely & unanimously approved by them, I was extremely concerned to find a scheme, wh. I flatter'd myself would be agreeable to all parties, so unexpectedly frustrated. Nothing could exceed my surprize at hearing your sentiments of the great naturalist whose name we have adopted, as I always conceived, from your eminent knowledge, as well as from y<sup>r</sup> having been the editor of some of his works, that you must have esteemed Lin<sup>s</sup> highly. I did not expect to find in a mind like yours any thing like narrow jealousy, or the petulancy of little minds, who are angry with Lin<sup>s</sup> because he cannot teach them what they have not abilities to learn. You must have other reasons for your judgement, & with respect to the classes of animals wh. you mention, Quad<sup>s</sup>., Birds, Amphib. & the Cetaceous fishes, my little knowledge would sink before yours, & I might be induced to give up my opinion, did I not know the merits of Lin. in other departments to which perhaps you have paid less attention. Surely, Sir, a botanist need never be ashamed to confess himself a pupil of Lin<sup>s</sup>? Nor do I know a systematic entomologist worthy to be compared with him. But I do not mean to trouble you with a defence of Lin<sup>s</sup>. I only beg leave to reply to some others of y<sup>r</sup> objections.

The Lin<sup>n</sup> Soc<sup>y</sup> is a body of naturalists associated for the purpose of cultivating the science, not to enlist themselves as the followers of any person whatever, any further than truth directs them. They have taken the name which you unfortunately dislike, but wch. I do not think they w<sup>d</sup> readily change, unless it were generally disapproved, nor should I soon be brought to consent to such an alteration. We have always conceived this



name peculiarly proper for us, who have among us the very museum & Lib<sup>r</sup> of Lin<sup>s</sup> in the house where we meet, for you know, Sir, I purchased all his remains. We consider his works as a good foundation to work upon, we are best able to determine the different objects he described, to correct his errors & improve what he has left imperfect. On this ground we call ourselves the Lin<sup>n</sup> Soc<sup>r</sup>, and I hope you will not think it an improper one. A similar society has been formed in Paris in imitation of ours, wch. has taken the same name: this shows there is nothing glaringly improper in it. We have among us some gentlemen who think in some measure with yourself as to the merits of the illustrious Swede, but all approve of the title of our Soc<sup>r</sup> for the reasons above mentioned.—I venerate Ray extremely & admire Hook, but there w<sup>d</sup> be no propriety in taking their names, & the mere title of a Nat<sup>l</sup> Hist<sup>r</sup> Soc<sup>r</sup> has been taken by another Soc<sup>r</sup> in London.—Pardon me Sir for having to so long intruded upon your valuable time dedicated to so much more important objects. I hope you will pardon the freedom with which I write. I have expressed my thoughts without reserve on the above subject, but shall not have compleatly done so unless I assure you of the high veneration and esteem which I sincerely feel for your char<sup>r</sup> & abilities. One w<sup>d</sup> wish for the honor of human nature that such a character were always free from weaknesses & prejudices, but perhaps that cannot be. That no such may be attributed to you by those who have contrary prepossessions, or who may not be acquainted with your work, I have kept your letter to myself. You are too respectable to be submitted to the judgement of mere common opinion & I could not bear to hear you slighting y spoken of.

I only beg leave as a particular favor, that you will inform me whether you continue in the same sentiments, & if so, how you would have it made known to the Soc<sup>r</sup>, or whether you have deigned to listen to the arguments I have presumed to offer you, & that you will allow your name to stand as it does at present.

I have the honor to be with the sincerest respect and consideration,

Sir, y<sup>r</sup> most ob<sup>t</sup> & very h<sup>ble</sup> Servant,

J. E. S.

Lond<sup>n</sup>, July 21, 1788.

(Pencil note at foot.)

This, tho' headed a *copy*, is in the handwriting of Sir Jas. Edwd. Smith himself, and was found among his papers after his death, when it was given me by his widow. S. D.

(Extract of a letter from Professor Allman.)

Dec. 2, 1896.

. . . I enclose two letters. . . I think the correspondence is too interesting to allow of its being lost without a record. My idea was that in consequence of its general interest as throwing

light on the characters of two eminent men of science as well as of Linnæus himself, it would find an appropriate place in one of our literary periodicals . . . but if you think the Linn. Soc. the best medium for its publication I am quite willing to have it read there. Indeed I have Mr. Davis's permission to do whatever I liked with it. . . .

GEORGE J. ALLMAN.

## APPENDIX. No. 2.

A Revision of the Genus *Elæocarpus*, Linn., based chiefly upon the specimens preserved at the Royal Herbarium and Museum Kew. By Sir DIETRICH BRANDIS, K.C.I.E., F.R.S., F.L.S.

(Abstract.)

[Read 30th June, 1898.]

LINNÆUS based the genus upon *Elæocarpus serratus*, described in his 'Flora Zeylanica.' At present 123 species are known, the majority of which are at home in the two Indian Peninsulas and the Indian Archipelagoes. A number of species, however, are found outside this area, on the west side in Madagascar, Mauritius, and Socotra, while eastward the genus is represented in China, Japan, New Guinea, Australia, New Zealand, and on many islands of the Pacific Ocean.

All the species are trees and shrubs, and they are remarkable in two respects. Many species are polygamous, the anthers of the female flower having the appearance of perfect anthers, but without any pollen, while the male flowers are generally without the rudiment of an ovary. No less than 22 species are polygamous, forming the section *Acronodia*. In regard to other characters however, the polygamous species might be distributed among the other sections of the genus.

Secondly: many species may be classed under groups, the species of one group being so closely allied each to the other that it often is difficult to keep them apart. These polymorphous types are most numerous within the central area, where the genus has received its greatest development.

## APPENDIX. No. 3.

Enquiries are frequently made regarding former Officers of the Society, and as the answers are soon lost sight of in the Letter book, it has been thought advisable to put them on record here for ready reference.

An asterisk denotes the present occupant of each post.  
[B. D. J.]

## Presidents.

- 1788-1828. *Sir* JAMES EDWARD SMITH.  
 1828-1834. EDWARD, *Lord* STANLEY (eldest son of 12th Earl of Derby).  
 1834-1837. EDWARD ADOLPHUS, 11th *Duke* of Somerset.  
 1837-1849. EDWARD STANLEY, Bishop of Norwich.  
 1849-1853. ROBERT BROWN.  
 1853-1861. THOMAS BELL.  
 1861-1874. GEORGE BENTHAM.  
 1874-1881. GEORGE JAMES ALLMAN.  
 1881-1886. *Sir* JOHN LUBBOCK, *Bart.*  
 1886-1890. WILLIAM CARRUTHERS.  
 1890-1894. CHARLES STEWART.  
 1894-1896. CHARLES BARON CLARKE.  
 1896- \* ALBERT CARL LEWIS GOTTHILF GÜNTHER.

## Treasurers.

- 1778-1798. SAMUEL GOODENOUGH, Bishop of Carlisle.  
 1798-1815. THOMAS MARSHAM.  
 1816-1849. EDWARD FORSTER.  
 1849-1855. WILLIAM YARRELL.  
 1856-1862. FRANCIS BOOTT.  
 1862-1873. WILLIAM WILSON SAUNDERS.  
 1873-1875. DANIEL HANBURY.  
 1875-1880. JOHN GWYN JEFFREYS.  
 1880-1881. FREDERICK CURREY.  
 1881- \* FRANK CRISP.

**Secretaries.**

- 1788-1798. THOMAS MARSHAM.  
 1798-1825. ALEXANDER MACLEAY. (RICHARD TAYLOR, 1810-1857,  
 Under-Secretary.)  
 1825-1832. JAMES EBENEZER BICHENO.  
 1832-1840. FRANCIS BOOTT.  
 1840-1860. JOHN JOSEPH BENNETT.  
 1857-1869. GEORGE BUSK (1857-1860, Under-Secretary). Z.  
 1860-1880. FREDERICK CURREY (1860-1862, Under-Secretary). B.  
 1869-1874. HENRY TIBBATS STAINTON. Z.  
 1874-1880. ST. GEORGE JACKSON MIVART. Z.  
 1880- \* BENJAMIN DAYDON JACKSON. B.  
 1880-1881. EDWARD RICHARD ALSTON. Z.  
 1881-1885. GEORGE JAMES ROMANES. Z.  
 1885-1895. WALTER PERCY SLADEN. Z.  
 1895- \* GEORGE BOND HOWES. Z.

**Assistant Secretaries.**

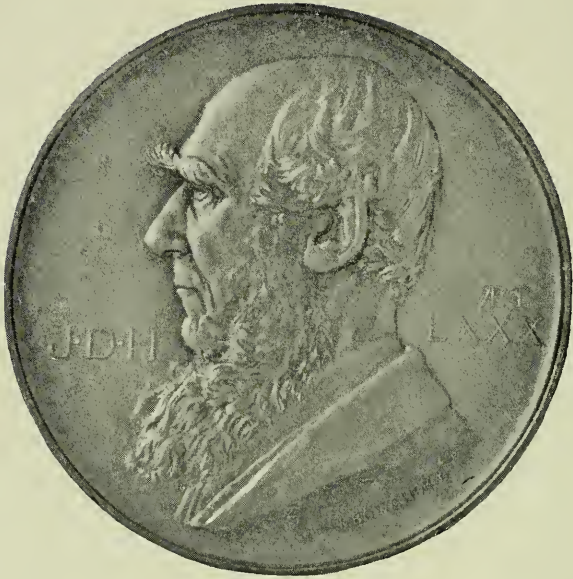
- 1876-1886. JAMES MURIE.  
 1897- \* JAMES EDMUND HARTING.

The office was abolished from 1886-1897 and revived in the latter year.

**Librarians.**

- 1778-1795? JONAS DRYANDER.  
 1795-1805. B. PRICE (as 'Clerk').  
 1805-1822. ROBERT BROWN (elected as 'Clerk, Librarian and House-  
 keeper').  
 1822-1841. DAVID DON.  
 1842-1881. RICHARD KIPPIST (Assist. Lib. 1830-1842).  
 1881-1886. JAMES MURIE.  
 1886-1897. JAMES EDMUND HARTING.  
 1897- \* AUGUST WILHELM KAPPEL (Assistant from 1884).
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## APPENDIX. No. 4.

## THE HOOKER MEDAL.

The circumstance under which this Medal was designed and presented have been detailed on p. 30. The accompanying illustration shows the design.

*Obverse.* Bust of Sir Joseph Dalton Hooker to left; inscribed, "J.D.H. Æt. LXXX." Modelled from life by Frank Bowcher.

*Reverse.* A wreath of Sikkim Rhododendrons, surrounding the following inscription:—

TO SIR JOSEPH DALTON HOOKER,  
M.D.R.N. G.C.S.I. C.B. D.C.L. LL.D. P.P.R.S. F.L.S. F.G.S.,  
in recognition of his services to Science.  
From the LINNEAN SOCIETY OF LONDON. 1898.

Designed by John Pinches, by whom the medal was struck.

The arrangements were initiated by a Committee of the Officers, with Sir John Evans, K.C.B., Dr. D. H. Scott, and Mr. W. Carruthers; the cost of the Medal, viz. £200 12s. 6d., was defrayed by a subscription from 119 Fellows.

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## APPENDIX. No. 5.

*Recipients of the LINNEAN MEDAL, founded on the occasion of the Society attaining its Hundredth Anniversary, 24th May, 1888.*

1888. } Sir RICHARD OWEN.  
      } Sir JOSEPH DALTON HOOKER.  
1889. ALPHONSE LOUIS PIERRE PYRAMUS DE CANDOLLE.  
1890. THOMAS HENRY HUXLEY.  
1891. EDOUARD BORNET.  
1892. ALFRED RUSSEL WALLACE.  
1893. DANIEL OLIVER.  
1894. ERNST HEINRICH HAECKEL.  
1895. FERDINAND JULIUS COHN.  
1896. GEORGE JAMES ALLMAN.  
1897. JAKOB GEORG AGARDH.  
1898. GEORGE CHARLES WALLICH.
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