

is sunk in the skin, and when the young are first born this depression, or miniature pouch, is large enough to hold them; when about a month or so o'd, their hinder parts may be seen sticking out; when two or three months old, only the head, and afterwards, as they become larger, only the snout is hidden, the marsupial bones, which are well developed, support the weight of the young one while sucking. The young does not leave the mother until at least one-third grown, and *even when fully the size of the adult, the quills are only then beginning to show through the skin, which is black, and thinly covered with black hair.*

The new species, *T. lawesii*, Ramsay, from Port Moresby, may be distinguished at once by the stiff flat bristles of the face and the more cylindrical form of its spines; *T. bruijnii* has a very long snout, nearly twice the length of any other species at present known. See *Proceedings L. Soc. of N. S. W.*, Vol. ii., Pt. I. Pl. I. E. P. RAMSAY

Australian Museum, Sydney, January 25

P.S.—It may interest your readers to know that Messrs. Ramsay Bros., of Maryborough, Queensland, have a fine series of eleven *Ceratodus alive* in a large tank constructed for them. These fish have now lived and thriven well in confinement for over eighteen months. I was the first to send the *Ceratodus* in spirits to England, although I never got the credit of it; nor did any of those naturalists to whom I forwarded specimens through a friend at the Zoological Society, ever think it worth their while to acknowledge them. Had it been otherwise, living specimens would have found their way to England long since. It is a great mistake to suppose the *Ceratodus* is now common; they can only be obtained at certain seasons and in certain parts of the Rivers Mary and Burnett. The *Osteoglossum (Bartramundi)*, with which the *Ceratodus (Tribin)* is often confounded, is plentiful enough in the western waters of Queensland.

E. P. R.

#### Fetichism in Animals.—Discrimination of Insects

I HAVE frequently noticed the fetichism of dogs, and was therefore much interested by Mr. G. J. Romanes' letter of December 27, which I have but just seen. Our terrier—a very queer character and a great warrior—is abjectly superstitious. He will not come near a toy cow that lows and turns its head, but watches it at a distance with nose outstretched. A vibrating finger-glass terrifies him; indeed he has so many superstitious that we often make him very miserable by working on his fears. I feel sure he constantly tries to understand, but never gets further than the sense of "uncanny"-ness. Dogs vary greatly as to this.

*A propos* of the discriminating power of insects. I have seen humming-bird moths deceived by sight. They were seeking in an open loggia, ceiled with wood, some dark place in which to hide; the pine wood was studded with brown knots. Again and again the two moths flew from knot to knot, felt and rejected them. At last they reached the open work—holes which looked much like the knots—and in them they hid themselves.

I was much struck at the time, as it appeared to me to show they possessed some dim sense of colour, but no defining perception of surface.

C. G. O'BRIEN

Cahirmoyle, Ardagh, Co. Limerick

#### Nitrification

IT seems right to direct attention to the fact that Bacteria were observed by Meusel to convert nitrates into nitrites; an abstract of which observations is to be found in the *Annals and Magazine of Natural History* for February, 1876; this abstract is copied from *Silliman's Journal* for January, 1876, where the reference to Meusel's paper will be found. This reference is *Ber. Berl. chem. Gesell.*, October, 1875.

No indication of their knowledge of these observations is to be found in Schloesing and Munk's paper in the *Comptes Rendus* (February, 1877) or in Mr. Warington's communication to NATURE, vol. xvii. p. 367.

F. J. B.

Oxford, March 11

#### The Wasp and the Spider

MAY I suggest a possible explanation of the curious case of spider-hunting by a wasp cited by Mr. Cecil; had the prey so accurately tracked by the wasp been anything but a spider, it would, indeed, have seemed an almost conclusive instance of

hunting by scent; but when one recollects the fine line usually left by spiders as they go, it is evident that sight or feeling may have been the sense exercised, and that the fatal clue may have been the guide to the wasp.

E. HUBBARD

March 18

#### ENTOMOLOGY AT THE ROYAL AQUARIUM

AN aquarium is put to its legitimate use when it is made the home of natural history exhibitions, and any attempt to rescue one from the too dominant sway of the showman deserves every support at the hands of science. The Entomological Exhibition, the opening of which at the Royal Aquarium we noticed last week, is also quite a novelty, though it is the outcome in a particular branch of the idea that led to the Loan Exhibition of Scientific Apparatus at South Kensington; as in that case the exhibitors are induced by no hope of prizes, but merely from the love of their science to lend their treasures. One learns from such an exhibition as this how much genuine love for natural history exists amongst men whose daily lives are devoted to manual labour, and that there are those who live within sound of Bow Bells, who make as good a use of their more limited opportunities as Edward in Banffshire. Here is a Mr. Machin, compositor by trade, whose long day's work has not prevented him from collecting and rearing a magnificent series of crepuscular and nocturnal moths, shown in twenty beautifully-arranged cases and accurately named; and the collections of some others are scarcely less noticeable in this respect. But apart from the interest attaching to some of the exhibitors, the material brought together affords an opportunity both to the entomologist proper and to the general naturalist not often to be met with. The greater portion of the whole exhibition is perhaps inevitably taken up with British lepidoptera, but these are not, as might be feared, an endless multitude of specimens of no special interest beyond their rarity and beauty, but are made to teach as well as please. Lord Walsingham, for example, shows the larvæ, pupæ, and imagines of nearly 370 species with the plants on which they occur—so that we have their complete life-history so far as it can possibly be represented to us. This, perhaps, from its scientific character and the beautiful means of preservation adopted, is the most interesting to the general naturalist, but there are others more limited, but scarcely less instructive—as those shown by the Messrs. Adams, in which the usual parasites are included in the series with each insect. Other instructive collections are those which illustrate the varieties of a single species; such is the set of specimens of *Colias edusa*, exhibited by Mr. Harper, a grand series showing insensible passages between perfectly distinct colourings. The influence of climate on colour is well illustrated in the melanic northern varieties of several species of moths, which are usually of a lighter colour in the south of England, the two varieties being placed side by side in the Yorkshire collections, and the results of selective breeding in the same direction in the photographs, unfortunately not specimens, of the common gooseberry moth, varying from nearly white to almost entirely dark. The moths and butterflies of the fen districts, which are now becoming so scarce, are represented by a very large collection by Mr. Farn. But one of the most interesting objects is a large white close-set web, in appearance like a cloth—some eight feet by four feet, spun by the larvæ of a moth, *Ephestia elutella*, that feeds on chicory. It is a portion only of a larger web, six times the size, formed on the walls and ceiling of a chicory warehouse in York, by the incessant marching to and fro of the well-fed larvæ. The threads composing it are less than  $\frac{1}{1000}$  inch in diameter, and as they are nearly contiguous and eight or ten deep, the portion exhibited represents about 4,000 miles of their wanderings. When twisted into a rope, it has been made to support a



weight of 56lbs. The foreign Lepidoptera also figure largely, and are naturally attractive from their beauty, and in General Ramsay's cases from Nepaul, for their rarity. This portion of the series, however, is chiefly valuable for the illustrations of protective mimicry which it affords. Admirable specimens of the leaf butterfly, *Kallima inachis*, with the varying tints of their under surfaces, are in Gen. Ramsay's collection, and Mr. Swanzy has a grand series specially arranged of Diademas and Papiliones mimicking—some in the females and some in both sexes—the nauseous smelling members of the Danaidæ and Acraidæ. Similar series are shown by Rev. J. A. Walker and Mr. Weir. The extraordinary differences between male and female in some butterflies is well illustrated by Mr. Briggs' collection of *Lycænas*.

The remaining orders are in some instances admirably illustrated, but by far fewer exhibitors. Dr. Powers' nearly complete collections of British coleoptera and British hemiptera, are among the best ever made; and Mr. Frederick Smith's hymenoptera, which supplied much of the material for the British Museum Catalogue, and Mr. Stevens' exhaustive collection of weevils, both the results of forty years' work, are here exhibited. A most instructive series of Grecian hymenoptera, with their galleries bored in briars, and some magnificent coleoptera from Ashantee, containing beautiful examples of *Goliathus Drurii*, complete the list of the more noteworthy objects. Some important orders are thus without special illustration here, but no doubt this will not be the last as well as the first of such exhibitions; and when it comes round to the insects again we may hope to see as complete sets of diptera or neuroptera as of other orders. It would be a great advantage to students if such exhibitions of limited classes could be periodically instituted by loan, and Mr. Carrington certainly deserves our thanks for the idea and its successful realisation.

THE GOVERNMENT RESEARCH FUND

THE following list of grants to be paid from the Government Fund of 4,000*l.* on the recommendation of the Royal Society, during the present year, in aid of scientific research, has been sent us for publication:—

Not Personal.

- David Gill, 93, Wimpole Street, W.—To defray Expenses connected with a Determination of the Solar Parallax by Observation of the Diurnal Parallax of Mars ... .. £250
- Rev. Dr. Haughton, Trinity College Dublin.—For Aid in the Numerical Reductions of the Tidal Observations made on board the *Discovery* and *Alert* in the late Arctic Expedition ... .. £75
- Prof. Fleeming Jenkin, 3, Great Stuart Street, Edinburgh.—For Experimental Investigations on Friction ... .. £50
- W. Chandler Roberts, Royal Mint, Tower Hill, E.—For Researches on Metals and Alloys in a Molten State passing through Capillary Tubes ... .. £25
- J. Kerr, Free Church Training College, Glasgow.—For Continuation of Electro-Optic and Magneto-Optic Researches ... .. £50
- J. Norman Lockyer, 16, Penywern Road, South Kensington, S.W.—For Continuation of Spectroscopic Researches £200
- Dr. O. J. Lodge, University College, Gower Street, W.C.—For Investigations into the Effect of Light on the residual Charge of Dielectrics; on the Conductivity of Hot Glass, and other Transparent Conductors, on Electrolytic Conduction, and other Subjects ... .. £100
- Thomas Stevenson, Hon. Sec. Scottish Meteorological Society, General Post Office Buildings, Edinburgh.—For Aid in carrying on a Simultaneous Series of Anemometrical Observations at different heights, and in sheltered and unsheltered situations ... .. £50
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- Sir William Thomson, University College, Glasgow.—For Tidal Investigations ... .. £100

- For Experiments in Magnetisation of different Qualities of Iron, Nickel, and Cobalt under varying Stresses and Temperatures ... .. £100
- J. E. H. Gordon, Pixholme, Dorking.—For Continuation of Experimental Measurements of the Specific Inductive Capacity of Dielectrics ... .. £100
- H. Tomlinson, 36, Burghley Road, Highgate Road.—For Researches on the Alteration of Thermal and Electrical Conductivity produced by Magnetism, and on the Alteration of Electrical Resistance produced in Wires by Stretching £100
- Prof. H. Alleyne Nicholson, University of St. Andrew's; R. Etheridge, jun., Geological Survey Office, Edinburgh.—For Aid in examining the Fauna of the Silurian Deposits of the Girvan District, Ayrshire, and in publishing a Descriptive List of the same ... .. £75
- R. McLachlan, 39, Limes Grove, Lewisham.—For Aid towards the Expense of Publication of a Revision and Synopsis of European Trichoptera ... .. £50
- C. Callaway, Wellington, Shropshire.—For Aid in working out the so-called Eruptive Rocks of Shropshire, and in verifying certain points in Local Geology ... .. £25
- H. T. Stainton, Mountsfield, Lewisham.—In Aid of the Publication Fund of the Zoological Record Association ... .. £150
- Dr. J. W. Dawson, McGill College, Montreal.—For Aid in excavating Erect Trees in the Coal Formation of Nova Scotia, in Beds where they are known to contain Reptilian and other Remains ... .. £50
- Dr. R. H. Traquair, Museum of Science and Art, Edinburgh.—For Aid in preparing and publishing a Monograph on the Carboniferous Ganoid Fishes of Great Britain ... .. £75
- W. Saville Kent, St. Helier's, Jersey.—To pay for Microscopical Apparatus for the Further Prosecution of Investigations into the Structure and Life-History of certain Lower Protozoa £50
- Dr. W. A. Brailey, 38, King's Road, Brownswood Park, Green Lanes, N.—For Researches on the Causes determining the Tension of the Globe of the Eye in Man and Animals, and on the Physiological Influence on this Tension of such Substances as Atropia, Daturin, Eserine, and Pilocarpine ... .. £25
- E. A. Schäfer, University College, Gower Street.—For Payment of an Assistant in Continuing his Histological and Embryological Investigations ... .. £50
- H. Woodward, 117, Beaufort Street, Chelsea.—For Continuation of Work on the Fossil Crustacea, especially with reference to the Tribolita and other Extinct Forms, and their Publication in the Volumes of the Paleontographical Society ... .. £75
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- Prof. E. J. Mills, 234, East George Street, Glasgow.—For a Research on Standard Industrial Curves ... .. £100

Personal.

- J. Allan Broun, 9, Abercorn Place, St. John's Wood, N.W.,—For Continuation of Correction of the Errors in the published Observations of the Colonial Magnetic Observatories £150
- Dr. J. P. Joule, 12, Wardle Road, Sale, near Manchester.—For an Exhaustive Inquiry into the Change which takes place in the Freezing and Boiling Points of Mercurial Thermometers by long Exposure to those Temperatures ... .. £200
- Prof. W. K. Parker, 36, Claverton Street, S.W.—For Assistance in Continuation of Researches on the Morphology of the Vertebrate Skeleton and the Relations of the Nervous to the Skeletal Structures chiefly in the Head ... .. £300
- Prof. A. H. Garrod, 10, Harley Street, W.—For Aid towards Publication of the Second Fasciculus of an Exhaustive Treatise on the Anatomy of Birds ... .. £100
- Rev. J. F. Blake, 11, Gauden Road, Clapham, S.W.—For Aid in continuing the Publication of a Synopsis of British Fossil Cephalopoda ... .. £100
- Dr. W. A. Brailey, 38, King's Road, Brownswood Park, Green Lanes, N.—For Researches on the Causes determining the