

showing their order of superposition and relative thickness. Although the division into systems, series, and formations are very detailed, the size of the chart is such, and the use of colours is so judicious, that there is little danger of it causing perplexity and confusion to the young student; the plan seems to us admirably clear and useful, and the table is in the highest degree creditable to its constructor, Mr. H. W. Bristow, F.R.S., F.G.S., director of the Geological Survey of England and Wales. It is intended for the use of schools, but we are sure it will be welcomed by many geological students who have long left school.

M. FELIX PLATEAU describes in *Les Mondes*, an ingenious process, of his own invention, for drawing on paper white lines on a black ground—a method so frequently used for scientific illustrations—by means of which both author and artist will be able to judge of the effect of such an illustration before putting it into the hands of the engraver. A piece of thickish paper, as smooth as possible, a little larger than the intended illustration, is heated, say by laying it, with proper precautions against being injured, on the top of a stove, and a piece of bees-wax is rubbed over it until the paper is completely covered with a thin coating. A piece of glass, the size of the paper, is blackened by being held over a candle, and when thoroughly cooled it is laid on the waxed paper and rubbed firmly with the fingers, the result being that a blackened surface is produced on the paper, on which any design can be traced with a needle for the finer lines, or the back of a steel-pen for the thicker ones.

A GREAT international horticultural exhibition is to be held at the Alexandra Palace on May 24 and five following days, on the occasion of the palace being opened to the public.

GENERAL COMSTOCK'S "Annual Report of the Survey of the North and North-Western Lakes" of America for the year ending June 1872, contains the results of much well-planned and thoroughly well-performed work. A well-constructed map illustrates the many topographical and hydrographical data. One point we may mention is that General Comstock has come to the conclusion, as the results of several years' observations, that the moon and sun undoubtedly cause tides in Lake Michigan, though the rise of level is very small indeed; the combination of the two at syzgies giving a tide somewhat less than 0.12 of a foot.

DR. B. W. RICHARDSON, F.R.S., has been elected by the President and Council of the Royal Society, Croonian Lecturer on the subject of muscular motion.

AMONG the Candidates for the professorship of Anatomy to the Royal Academy are Dr. B. W. Richardson, F.R.S., and Mr. John Marshall, F.R.S.

THE *Academy* understands that Mr. Moggridge, author of "Harvesting Ants and Trap-door Spiders," recently reviewed in *NATURE*, has deposited specimens of the animals and their nests in the British Museum, and that they are exhibited in one of the public galleries.

THE additions to the Zoological Society's Gardens during the last week include a black Cuckoo (*Endynamys sp?*) from Madagascar, and a Seychellean Sternotherid (*Sternothera subniger*) from the Seychelles, presented by Commissioner H. C. St. John; four Spanish Terrapins (*Clemmys leprosa*), and six Greek land-tortoises (*Testudo græca*) from Morocco, presented by Sir J. Drummond Hay, K.C.B.: a Vulpine Squirrel (*Sciurus vulpinus* var. *capistratus*) from S. America, presented by Mr. G. Moore; a Barbary Ape (*Macacus inuus*) from N. Africa, deposited by Lord Calthorpe; three Barbary Sheep (*Ovis tragelaphus*) born in the Gardens; a De Filippi's Meadow Starling (*Sturnella defilippi*) from Rio de la Plata, and a Black Kite (*Milvus migrans*), European, purchased; and two variegated Touracoons (*Schiorhis africana*) from W. Africa, received in exchange.

#### PREHISTORIC CULTURE OF FLAX

DR. OSWALD HEER, the eminent botanist, and one who has devoted so much attention to the structure and history of fossil plants, publishes an article upon flax and its culture among the ancients, especially the prehistoric races of Europe. His memoir may be summarised as follows: First, flax has been cultivated in Egypt for five thousand years, and that it was and is one of the most generally diffused plants of that country. It occupied a similar position in ancient Babylonia, in Palestine, and on the Black Sea. It occurred in Greece during the prehistoric period, and at an early date was carried into Italy, while its cultivation in Spain was probably originated by the Phœnicians and Carthaginians. Second, it is also met with in the oldest Swiss lacustrine villages, while, at the same time, no hemp nor fabrics manufactured from wool are there to be found. This is considered a remarkable fact, since the sheep was one of the oldest domestic animals, and was known during the stone period. The impossibility of shearing the fleece by means of stone or bone implements is supposed to have been the reason why woollen fabrics were not used. It is thought probable that the skin, with its attached wool, was probably made use of for articles of clothing. Third, the lake dwellers probably received flax from Southern Europe, from which section fresh seeds must have been derived from time to time. The variety cultivated was the small, native, narrow-leaved kind from the coast of the Mediterranean, and not at all that now raised in Europe. It must, therefore, have been cultivated also in Southern Europe, although Dr. Heer could not ascertain among what people and at what age this took place. If this could be ascertained it would be an important point in the determination of the antiquity of the lake dwellers. Fourth, at the time of the empire both summer flax and winter flax were cultivated in Italy, as now, but in what form it was grown in ancient Egypt is not determined. It is thought probable that the narrow-leaved variety was first introduced, and after that the Roman, and then the common varieties followed. The common plant has doubtless arisen from the cultivation of the narrow-leaved, while the Roman winter flax and the *Linum ambiguum* constitute the intermediate stages. The original home of the cultivated flax was therefore along the shores of the Mediterranean. The Egyptians had probably cultivated it, and from them its use was doubtless disseminated. It is possible that the wild variety and the winter flax were grown elsewhere at the same time, when the cultivated variety had long since driven them out of use in Egypt.

#### SCIENTIFIC SERIALS

IN the *Journal of Botany* for February Dr. Trimen describes one of the most interesting additions recently made to the British flora, *Juncus pygmaeus*, a well-known European species, discovered by Mr. W. H. Beeby in the already very rich locality of Kynance Cove, Cornwall. The article is accompanied by a good drawing. Mr. J. G. Baker gives a description of the little known *Rosa appennina*. In geographical botany Dr. W. M. Hind contributes a list of plants of North Cornwall. Mr. W. Phillips's notes on the blue reaction given by iodine in certain fungi may furnish a useful discrimination of difficult species. In the March number Mr. Worthington Smith gives a description, with coloured plate, of several new Hymenomycetous fungi from stoves; and Mr. J. A. Lees a useful paper on the peculiarities of plant-distribution in the neighbourhood of Leeds. Dr. H. F. Hance has an article on the "Ch'ing Muh Hsiang" or "Green Putchuk" of the Chinese, derived from a species of *Aristolochia*, the paper being illustrated by a copy of a native drawing. In both these numbers are also a variety of selected articles, short notes, and memoranda. We are glad to see this interesting journal taking so increasingly useful a place among our scientific periodicals.

AMONG the numerous articles of interest in the *Scottish Naturalist* for January (commencing the 2nd volume) we may single out especially, "On the occurrence of the hooded seal (*Cystophora cristata*) at St. Andrews," by Mr. R. Walker; a commencement of an article on Scottish gall-making insects, by Mr. P. Cameron, jun., illustrated by a beautiful coloured plate of *Nematus gallicola*; and a paper on the recent remarkable abundance of *Vanessa Antiopa*, the "Camberwell beauty," in this country, by the editor, who sums up strongly in favour of the native rather than the foreign origin of the insects captured in

this country last year. We have also a continuation of the "Insecta Scotica," in instalments of the Lepidoptera of Scotland, by Dr. Buchanan White, and the Coleoptera of Scotland, by Dr. D. Sharp.

THE *Journal* of the Royal Geological Society of Ireland, vol. iii. part 2, n. s. (vol. xiii. part 2) contains:—Reply to the observations in Mr. Kinahan's paper "On the Carboniferous Rocks of Iceland," by Prof. Ed. Hull, F.R.S. (Abstract); On *Phaneropleuron Andersoni* (Huxley) and *Uronemus lobatus* (Agas.), by Prof. Traquair, M.D. (plate v.); Additional Notes on the fossil Flora of Iceland; On *Filicites plumiformis* (Baily) from carboniferous limestone near Wexford, by W. H. Baily (plate vi.); Notes on the Carrara marble quarries, by Prof. E. Hull; On a remarkable fault in the New Red sandstone of Rainhill, Lancashire; and observations on the results determined by the Royal Commission into the Coal Resources of Great Britain and Ireland, by Prof. E. Hull; Sketch of the physical geology of North Clare, by W. H. S. Westropp; On tertiary iron ore in the County of Londonderry, by G. H. Kinahan; and Notes on Woodwardite, by Prof. J. E. Reynolds.

THE *Monthly Microscopical Journal* for April is an excellent number, containing several valuable papers. Mr. Wenham gives his new formula for microscope object-glasses, recently read before the Royal Society. Till recently high objectives have been formed of eight lenses, a front and back triplet with a middle doublet, consequently the rays of light are subject to error arising from sixteen surfaces of glass. The author some time ago substituted a single thick plano-convex for the anterior triplet, and in so doing reduced the number of reflecting surfaces to twelve, improving the instrument so much that his system has been generally adopted. In the new object-glass the number of lenses is still further reduced to five, and the surfaces consequently to ten; in it the front plano-convex remains, the back triplet is made the centre of the system, and the over corrected rays which leave it are rendered parallel at the point of emergence by a long focus plano-convex glass. In this combination therefore the whole correction is performed by a single concave of dense flint, and therefore two single lenses of crown, whose foci bear a definite relation to each other. Dr. Urban Pritchard's excellent observations "On the structure and function of the Rods of the Cochlear in man and other animals" are given *in extenso*. Dr. E. Hofman's paper on "Hair in its microscopical and medico-legal aspects" is translated, forming a concise summary for the student of forensic medicine. Dr. Maddox makes "Some remarks on a minute plant found in an incrustation of carbonate of lime," which he considers to be of the genus *Botrydium*, and names *B. minutum*.

THE *American Naturalist* for March contains an article by Mrs. Mary Treat, on "Controlling Sex in Butterflies." The authoress, as the result of an accident, observed that the larvæ of *Papilio asterias* when underfed almost invariably developed into male butterflies, but that when freely supplied with their favourite diet, they almost as certainly developed into females. She repeated these experiments on large numbers with the same result, and has verified them on *Vanessa antiopa* and the moth *Dryocampa rubicunda*. Mr. A. S. Packard criticises these results, and shows that the earliest indications of the sexual glands appear when the larva is but little developed, and that they are often fully formed when it is adult. There are papers by Profs. Marsh and Cope on the extinct Ungulata of the Wyoming district, in which some dates of publication are fully discussed. Among the other papers are, Prof. Perkins on "The Flying Squirrel;" C. Ran, on "Indian Netsinkers and Hammerstones;" and R. Ridgway, on "The Vegetation of the Lower Wabash Valley."

*Ocean Highways*, New Series, No. 1.—The new form of this valuable journal is a great improvement on the original unhandy form, though we do not think the increase in bulk is very great. This number is a particularly interesting one. The first article is called forth by the Khiva expedition, and gives a summary of the commercial and political history of the Caspian, and the region to the eastward; it is illustrated by two good maps. "The Great Rivers of China" is the title of a short article by Dr. F. Porter Smith, while Mr. C. E. Austen, C.E., contributes a useful article, accompanied by an excellent map, on "Railways in Asia Minor." Mr. D. Hanbury has a short article on myrrh, the object of which is to induce travellers to collect data for its botanical elucidation. Prof. Mohn describes the origin and history of the Meteorological Institute of Christiania; a map by

the same gentleman is given, illustrating the explorations by Norwegian Captains about Spitzbergen in 1872; accompanying which is a short editorial paper on Wiche's Land, defending the name given to it by Edge in 1617. One very interesting paper is by Mr. T. F. Hughes, on "Formosa and its southern Aborigines." "In this fair island of the distant eastern seas," he says, "there is still a mine of discovery and information awaiting the cunning hand of the scholar and traveller." Reviews, notes, reports, correspondence, &c., complete this interesting number.

## SOCIETIES AND ACADEMIES

LONDON

Royal Society, April 3.—"On the Structure of Muscular Fibre," by E. A. Shafer.

"Note on the Synthesis of Marsh Gas, and the Electric Decomposition of Carbonic Oxide," by Sir B. G. Brodie, F.R.S.

"On an Air Battery," by Dr. Gladstone, F.R.S., and A. Tribe.

Chemical Society, April 3.—Dr. Odling, F.R.S., &c., president, in the chair.—A paper on "A method of determining with great exactness the specific gravity of liquids," was read by the author, Dr. Sprengel. The instrument, consisting of a U-shaped glass tube terminating in capillary tubes bent at right angles, is very delicate when proper precautions are taken.—The second paper, entitled "Researches on the action of the copper-zinc couple on organic bodies:—No. II. on the iodides of methyl and amyl," by J. H. Gladstone, F.R.S., and A. Tribe, is a continuation of the authors' researches on this subject, an account of which they communicated to the Society some short time ago.—Dr. C. R. A. Wright then read a memoir "On Cymene from various sources," in which he gives the results of his examination of cymene prepared from eight different sources, showing them to be identical.—The last paper was by Dr. H. E. Armstrong, being No. XI. of "Communications from the Laboratory of the London Institution; action of the acid chlorides on nitrates and nitrites—Part I. Acetic chloride."

Zoological Society, April 1.—Mr. R. Hudson, F.R.S., vice-president, in the chair.—A communication was read from Dr. J. S. Bowerbank containing a description of the brain and of a portion of the nervous system of *Pedicularis capitata*.—A communication was read from Dr. J. E. Gray, F.R.S., containing remarks on the genera of Turtles (*Outcropodes*), and especially on their skeletons and skulls.—A second communication from Dr. Gray contained the description of the skull of *Sternotherus*.—Dr. A. Günther, F.R.S., read descriptions of three new species of Flying Squirrels, proposed to be called *Pteromys tephromelas*, from Penang, *P. phocomelas*, from Borneo, and *Sciuropterus pulverulentus*, from Penang and Malacca.—Mr. O. Salvin made some remarks on the tail-feathers of the birds of the genus *Momotus*, and on the mode in which their peculiar form had originally arisen.

Geological Society, March 26.—His Grace the Duke of Argyll, K.T., F.R.S., president, in the chair. The following communications were read:—I. "Synopsis of the younger formations of New Zealand," by Capt. F. W. Hutton, F.G.S., of the Geological Survey of New Zealand. In this paper the author gave a summary of the Tertiary and later Secondary formations of New Zealand. He stated that he had been able to determine 375 species of true Mollusca, 12 of Brachiopoda, and 18 of Echinodermata from the Tertiaries; and under each of the formations which he recognises he gave the number of species of true Mollusca found in it, indicating the number of recent species, and of those belonging to other formations occurring in each. He also noticed the range and distribution of the various formations. The Tertiary groups of strata distinguished by the author are, in descending order, as follows:—I. Pleistocene. II. Pliocene: 1, the Newer Pliocene or Whanganui group; 2, the Older Pliocene or Lignite group. III. Miocene: 3, Upper or Arvater group; 4, Lower or Kanieri group. IV. Oligocene: 5, Upper or Hawke's Bay group; 6, Lower or Waitewata group. V. Eocene: 7, Upper or Ototara group; 8, Lower or Brown Coal group. As belonging to the Mesozoic series, the author also described beds of Danian age, under the name of the Waitewata formation. A species of *Belemnitella* occurs in beds belonging to the Ototara group, and also in the Waitewata formation. Volcanic action commenced in the North Island during the deposition of the Waitewata group, and has since been almost continuous in the northern, western, and central parts of the