

SCIENTIFIC SERIALS

THE *American Naturalist* for February, among others, contains an article by Dr. Gill on "The Limits of the Class of Fishes," in which he endeavours to modify their generally accepted classification by dividing them up into two classes and three sub-classes, of equal significance with the reptiles and birds. The names he proposes are (1) Pisces; (2) Marsipobranchii; and (3) Leptocardi, which sufficiently indicate the genera he includes in each class. Such an amount of division we think excessive, and it would undoubtedly necessitate the removal of the crocodiles from the reptilia, among other changes. Mr. A. S. Packard gives an account of one of the beaks of a cuttle-fish, probably *Architeuthis dux*, which is four and a half inches long; he also describes other colossal specimens. There is a paper by Prof. Jordan on the colours of vegetation, one by Dr. Abbott on the habits of certain crawfish, and another by Dr. Foster on the pottery of the mound-builders, which is fully illustrated.

THE Munich *Zeitschrift für Biologie*, Bd. 8, Heft 4, contains the following papers of purely medical interest: on the occurrence of enteric fever in the Bavarian army, by Dr. Port, with charts of the mortality in the different barracks and of the amount of subsoil water; on the present state of the cholera problem, by Prof. von Pettenkofer; and on the processes of decomposition which result from venesection, by Dr. J. Bauer.

Schriften der Naturforschenden Gesellschaft in Danzig, New Series, vol. 3, Part I. The first paper in this publication of the Danzig Society is a contribution to primitive German history by Dr. Lissaicer of Danzig, being a very careful and elaborate monograph on some skulls found at Meisterswalde and Krissau, a short distance from Danzig. The paper is accompanied by some capitally executed photographs of the skulls. The next paper is also a contribution to the history of the early inhabitants of Pomerania, being a description by Herr Kasiski of the numerous and varied contents of some of the ancient graves which abound in the district around the village of Persanzig, on the river Persante, a short distance west of Neustettin. The district abounds with material for the archaeologist. The paper is accompanied with numerous illustrations of the contents of the graves. The next paper is a long one by Dr. C. J. H. Lampe, of Danzig, on the Movement of Water in pipes, accompanied by some calculations as to the pressure and speed of the water in the pipes by which Danzig is now supplied with water from a considerable distance. This paper is also illustrated, as is also the last one, which is the fifth part of A. Menge's Catalogue of Prussian Spiders.

Der Zoologische Garten (Frankfurt a. M.), January 1873, contains an excellent article, with maps in illustration, of the geographical distribution of the Birds of Paradise, with which are included *Epimachus* and *Ptiloris*. There is also an article by Dr. H. Dörner on the tongue of the Ka-ka Parrot (*Nestor meridionalis*), in which he shows clearly that in structure it presents none of the characters of the *Trichoglossinae*, and in other points his results quite agree with those read before the Zoological Society of London in June last, although he, following Dr. Finsch, does not feel disposed to remove this parrot from among those with trichoglossal tongues, because of a supposed similarity in their beaks, which we find it difficult to appreciate, the Ka-ka's being black and ribbed, whilst that of *Lorius* is smooth and with an orange tint. There is not the least doubt that, now it has been doubly demonstrated that their tongues are not similarly constructed, there is not any good reason for associating the Nestors with the Lories.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, March 6.—"On the Vapour-density of potassium."—Preliminary notice. By James Dewar and William Dittmar.

The results of their observations conclusively show that the density of potassium-vapour, as produced in the process described, cannot exceed 45 times that of hydrogen, and that therefore the molecule of potassium consists of two atoms (K_2).

"On New Sources of Ethyl- and Methyl-Aniline." By John Spiller, F.C.S.

"On a new genus of Amphipod Crustaceans. By Rudolph von Willemoes-Suhm, Ph.D., Naturalist to the *Challenger* exploring expedition.

In lat. $35^{\circ} 47'$, long. $8^{\circ} 23'$, off Cape St. Vincent, the trawl was sent down to a depth of 1090 fathoms on the 28th of January and brought up among other very interesting things a large, transparent Amphipod with enormous faceted eyes. The animal evidently hitherto unknown, will be the type of a new genus, having the following characters:—

THAUMOPS, nov. gen.

Caput oblongum, inflatum, oculis maximis superiorem capitis partem tegentibus. Segmenta thoracica 6, abdominalia 5. Antennarum in feminis par unum, maxillarum par unum, pedum paria duo minima maxillarum locum tenentia. Mandibulæ nullæ. Pedes thoracici 5, abdominalia 3 in quoque latere. Appendices caudales 4. Gangliorum pectoralium paria 5, abdominalium 3.

T. pellucida, n. sp.

Corpus longitudine 14 mm., latitudine 21 mm., pellucidum.

It could not be made out whether *T. pellucida* inhabits the deep sea, or whether it is, like *Phronima*, a pelagic animal, having been caught by the trawl only as the latter came up from the depth.

Geological Society, February 26.—Prof. Ramsay, F.R.S., vice-president, in the chair.—The following communications were read:—"On the Jurassic Rocks of Skye and Raasay," by Dr. James Bryce. In this paper the author described numerous sections of Jurassic rocks exposed chiefly in the sea-cliffs of Skye and Raasay, indicating the presence in those islands of a complete series of beds ascending from the Lower Lias to the middle of the Middle Oolite. He noticed the occurrence in these sections of fossils belonging to the zones of *Ammonites angulatus* and *A. Buchlandi* in the Lower Lias, to the zones of *A. Jamesoni*, *A. capricornus*, *A. margaritatus*, and *A. spinatus* in the Middle Lias, of Upper Lias fossils, including *Anmonites communis*, *falcifer*, *heterophyllus*, and *bifrons* and of others indicating beds belonging to the Inferior Oolite and Cornbrash, and to the Oxford Clay. The Loch Staffin beds were described as an estuarine series, nearly approaching the Oxford Clay in geological age, and including a bed almost entirely made up of shells of *Ostrea hebridica*. The whole series of Jurassic rocks in these islands reposes on the Torridon sandstone of Cambrian age; and the author discussed the question whether or not the intervening beds have ever existed in this locality, and came to the conclusion that they probably existed, and have been swept away by denudation. He remarked further upon the resemblance in lithological characters of the beds described with the corresponding deposits elsewhere in Britain. The traprocks intruded between the Jurassic deposits he regarded as of post-oolitic date.—"Observations on the more remarkable Boulders of the North-West of England and the Welsh Borders," by Mr. D. Mackintosh. In this paper the author described the situation and indicated the probable origin of many of the more striking known boulders in Westmoreland, Cumberland, Lancashire, Cheshire, and on the borders of Wales. The northern boulders seem to have originated chiefly from Westdale Crag, Criffel, Ennerdale, and Eskdale; those of Cheshire chiefly from the Lake District and South of Scotland; and many of those on the Welsh borders from the mountains of Wales. Many of the boulders noticed by the author exhibit glacial striae. The author also especially referred to the occurrence of boulders at high levels.

Linnæan Society, March 6.—Mr. Bentham made some observations on the homology of the perigynium or utricle of the female flowers of *Carex* and *Uncina*, with a view to calling to the disputed points in question the attention of botanists used to microscopical investigation, who may have the opportunity of examining living specimens in the earliest stages of flowering. Two principal explanations of the homology of the perigynium of *Carex* have been given. Brown, relying upon its being composed of two squamæ, considered that it represents a perianth, and Payer and Schleiden have adopted the same view, after an examination of its appearance at a very early stage. Kunth, on the contrary, believed it to be formed of a single scale, and to be an ordinary glume subtending the female flower on a secondary axis, of which the seta of many species of *Carex*, and of

all the species of *Uncinia*, is the continuation. If the perigynium is really formed of a single scale, Kunth's view is very plausible, but the two keels or principal nerves, which in most species end in two points or lobes, are strong evidences of its double nature. Kunth explains that circumstance by the suppression of the central nerve or keel owing to pressure, of which, however, there is no appearance in any species examined. Payer states also positively that the two are distinct at an early stage, and unite as they grow up; but implicit reliance is not always to be placed upon his having always clearly seen the minute microscopic and obscure protuberances he delineates. Schleiden delineates the two parts of the perigynium and the seta as forming three parts of one whole; but his drawing is not to be depended upon, as he places them in a wrong position with relation to the axis and the subtending glume. Kunth confirms his views by a comparison with the palea and occasional seta of Gramineæ, but here the position of the two parts in the two orders is by no means homologous. Independently of the relation to the other parts of the flower, the seta or prolonged axis in Gramineæ is outside the palea, in *Carex* inside the perigynium. A stronger confirmation is taken from two South African species of *Schoenoxiphium* (not generically distinct from *Carex*) in which the seta occasionally bears a spike of male flowers. This spike appears to be sterile, and may be a case of proliferation, but requires further investigation. If it be a normal spike, we must conclude the perigynium or subtending glume to be formed of one scale; for two opposite scales at the base of an alternate inflorescence is a derangement of the ordinary course of change from the alternative vegetative organs to the opposite or whorled floral organs, which is believed to have no example at least in Monocotyledons. If the perigynium is formed of two scales they must belong to the floral whorls. They are not subtending bracts analogous to the two free bracts of *Diplacrum*, or the united ones of *Hoppia*, for in both those cases the female flowers are terminal without any other subtending glume, and in *Carex* the female flower is lateral, and the perigynium is within one outer subtending glume. That they are two out of three parts of a real perianth is rendered improbable by their great development in one sex in an order where it is in all other genera suppressed or rudimentary, and without any trace of it in the other sex. The only remaining supposition is that the perigynium and seta represent the stamens of the male flowers, and are therefore in fact staminodia. The position with relation to the axis and subtending glume is the same, and although they are very different in form and texture, that difference is much diminished in *Uncinia longifolia* where the dilated filaments of the males assume the aspect nearly of the perigynium of the females. The lobes of the perigynium in *Carex subulata*, and occasionally in some *Uncinias*, have the look of the seta of *Uncinia*, and in one instance that seta bore a perfect anther. Brown confirmed his view of the perianth-nature of the perigynium by a specimen of *Carex acuta* with stamens within the perigynium. An examination of beautiful specimens of this form of *Carex acuta*, gathered by Mr. Spruce in Yorkshire, shows, from the position and structure of the stamens bearing perigynia, that they are altered female flowers in which more or less imperfect stamens replace the carpellary leaves of which the pistil is formed. If this homology of the perigynium with the androecium of the male flower is thought plausible, it is still doubtful, and the doubt can only be solved by a careful repetition of Payer's observations, and a repeated study of the anomalies of *Schoenoxiphium*, and of those species of *Carex* in which the seta is variously developed, many of the forms delineated in the late Dr. Booth's splendid illustrations of the genus requiring a special study on the specimens themselves.

Zoological Society, March 4.—Mr. John Gould, F.R.S., V.P., in the chair.—Mr. Edwin Ward exhibited the original leg-bones of *Dinornis maximus*, from Glenmark Swamp, near Christchurch, New Zealand, described by Prof. Owen in the Society's "Transactions," belonging to Col. Michael.—A communication was read from the Rev. O. P. Cambridge on the spiders of St. Helena, founded on the collections made in that island by Mr. Melliss. The total number of known spiders of St. Helena was stated to be forty, of which eleven were now described for the first time. The species were mostly European in form.—A communication was read from Dr. John Anderson, F.Z.S., Curator of the Indian Museum, Calcutta, on the species and dentition of the Southern Asiatic Shrews, preliminary to a proposed monograph of the group.—A communication was read from Mr. M. R. Butler, being the description of a remarkable new species of butterfly, of the genus *Tanaecia*, from Penang.—

Messrs. P. L. Sclater and O. Salvin read a paper on the birds of Eastern Peru, with notes on the habits of the birds by Mr. E. Bartlett. The total number of species hitherto recorded as met with in the district was stated to be 473, of which 108 were unknown elsewhere.—A communication was read from Surgeon-Major Francis Day on some new or imperfectly known fishes of India.—A communication was read from Mr. G. E. Dobson, M.B., on secondary sexual characters in the [Chiroptera. Mr. Dobson pointed out that, contrary to what Mr. Darwin had believed to be the case, special structural characters existed in the males of species of the genera *Phyllorhina* *Taphozous*, and other genera of bats.

Anthropological Institute, Feb. 18.—Prof. Busk, F.R.S., president, in the chair. Sir John Lubbock, Bart. exhibited two heads of Macas Indians, and contributed a note of the mode of their preparation. Mr. W. Topley read a paper "On the Relation of Parish Boundaries in the south-east of England to Great Physical Features, particularly to the Chalk Escarpment."

March 14.—Prof. Busk, F.R.S., president, in the chair.—A paper was read by Dr. A. Campbell "On the Looshais," a people inhabiting the hill district of Chittagong. They are fairer in complexion than the people of the plains, and their features resemble those of the Malays rather than the Tartar-like people of Mumpore. They have no distinction of caste; marriage is a civil contract, dissolvable at the will of both husband and wife. The men live by hunting, whilst the women are engaged in household work.—Sir Duncan Gibb read a paper on "Stone Implements and Pottery from Canada." After describing a collection of arrow and spear heads, some hatchets, and pottery collected by himself in various parts of Canada, he considered the first two as the most ancient implements found in that country, for reasons which he gave, and placed the period of their use at about 200 B.C., although he saw no reason why they might not have been employed 4,000 years ago.—Mr. Hodder M. Westropp contributed a short paper on "The Ventnor Flints," descriptive of fragments of flint and other stone, bearing resemblances to the true arrow-heads and implements of ancient manufacture; and it was shown that the specimens exhibited were wanting in the bulb of percussion and the chipping at the edge which characterised the genuine articles.—The President described an Australian skeleton from the Murray River, which had been sent to the museum of the institute by Dr. Robert Peel, of Adelaide. It was announced that further committees had been appointed for Physical Characters of Mankind; Priscan Archæology; and Descriptive Ethnography.

Chemical Society, March 6.—Dr. Gladstone, F.R.S., vice-president, in the chair. The following communications were read: "On the action of hydrochloric acid on codeine," by Dr. C. R. A. Wright, being a continuation in the codeine series of the author's former researches on morphine. "On new processes for mercury estimation with some observations on mercury salts," by J. B. Hannay. "On a method of estimating nitric acid," by T. E. Thorpe, F.R.S.E., the process depending on the ease with which nitric acid is converted into ammonia by the copper-zinc couple of Messrs. Gladstone and Tribe. "Note on a reaction of the acetates upon lead salts with remarks on the solubility of lead chloride," by F. Field, F.R.S. "Observations on the nature of the black deposit in the copper-zinc couple," by J. H. Gladstone, F.R.S. and A. Tribe, F.C.S. "On an air-bath of constant temperature between 100° and 200° C.," by Dr. H. Sprengel. This consists of a bath similar to the ordinary chemical hot-water oven but made of sheet-lead and filled with dilute sulphuric acid of such a strength as to boil at the desired temperature.

Entomological Society, Feb. 17.—Prof. Westwood, president, in the chair.—Mr. Bond exhibited bred specimens of *Acronycta tridens* and *A. Psi*, showing the differences between the two species.—Mr. Müller exhibited some spiral cases of a species of *Psyche*, and also the egg-case of a species of *Manitis*, both sent from Calcutta by Mr. James Rothney.—Prof. Westwood exhibited two dipterous larvæ preserved in spirits, discharged by a woman in a clot of phlegm, which were probably larvæ of *Psila rosa*, swallowed with raw carrots. After they had been immersed in spirits for three or four days he took them out for examination, and was surprised to find that they were still alive. He also showed drawings of vine-stems, with excrescences caused by a beetle (*Oliorhynchus*).—Mr. H. W. Bates read a paper on the geodephagous beetles of Japan, col-

lected by Mr. George Lewis.—Mr. Müller read a list of entomological works and papers, no notice of which was to be found in Dr. Hagen's "Bibliotheca Entomologica."—Mr. F. Smith read some remarks by Prof. Siebold, on the salivary organs of the honey-bee.

March 3.—Prof. Westwood, president, in the chair. Mr. Vaughan exhibited a box containing about 200 specimens of Japanese *Lepidoptera* collected by Mr. Henry Pryer, near Yokohama.—Mr. T. Smith exhibited insects bearing a remarkable resemblance to each other, although belonging to different orders. *Euglossa dimidiata*, a bee, had a striking resemblance to a species of the Dipterous Genus *Asilus* from South America. Also *Abispa splendida*, one of the *Vespidae*, resembled an insect of the Dipterous genus *Laphria*; both from N. Holland. Also a bee of the genus *Megachile* resembled an *Asilus*. The two last-mentioned resembled each other, not only in general appearance, but the *Asilus* was also furnished on the under side with a pollen brush, in the same manner as in *Megachile*, although it was not apparent for what purpose the insect required it. The president remarked that when he was at Ancona he observed several insects of the genus *Osmia* and *Megachile* extracting pollen from black poppies, and on the sandy shore he noticed the same insects collecting the sand. He therefore concluded that the pollen brushes were used, not only for collecting the pollen, but also for carrying the grains of sand to their nests. It was probable, therefore, that the *Asilidae* that were furnished with brushes might use them for a similar purpose. Mr. Champion exhibited *Bagous brevis*, taken in this country for the first time by Dr. Power.—Mr. Müller directed attention to an article in the *Petites Nouvelles* explaining a method of obtaining silk from cocoons which had been eaten through by the insects—and that the silk so obtained from the damaged cocoons was equal in quality to that obtained from the perfect cocoons.

Royal Horticultural Society, March 5.—Scientific Committee.—J. D. Hooker, M.D., C.B., F.R.S., in the chair. A note was read from Dr. Boswell Syme on the intra-paleal fertilisation of wheat. He found that the anthers are empty when they are extended, and that the stigmas are never extended beyond the pales at all.—Mr. A. W. Bennett read an abstract of a paper by Hildebrand, on the same subject.—The Rev. M. T. Berkeley exhibited specimens of a fungus, *Cladosporium herbarum*, from the inner surface of the shell of a boiled egg.—General Meeting.—W. Wilson Saunders, F.R.S., in the chair. Prof. Thiselton Dyer made some remarks on a cone of *Araucaria Bidwillii* from the tree in the temperate house at Kew, on specimens of *Dendrobium Hillii* and *Clematis indivisa*, a fine species from New Zealand, and also on *Amorphophallus Rivieri*, a remarkable Aroid with inflorescence, shown by Mr. Bull. It had been introduced by the French into the Jardin d'Essai at Algiers, from Cochinchina.

Royal Microscopical Society, March 5.—Chas. Brooke, F.R.S., president, in the chair. Mr. E. J. Gayer contributed some further notes on the micro-spectroscope and microscope, in continuation of his paper upon the same subject, read at the December meeting of the Society.—A paper by Dr. Maddox, on a minute plant found in an incrustation of carbonate of lime, was also read to the meeting, and was illustrated by drawings and prepared specimens exhibited under the microscope, by Mr. Reeves.—The secretary stated, with reference to some crystals shown at the previous meeting, obtained from the condensed vapour of coke, that they had been examined by Mr. Bell, and found to consist chiefly of protosulphate of iron.—A new metallic chimney for microscope lamps was introduced by Mr. Wenham, its merits being explained by the secretary, and discussed by the meeting.

CAMBRIDGE

Philosophical Society, Feb. 3.—Professor Humphry, president, in the chair. It was decided to admit as associates residents in Cambridge and the neighbourhood, not being graduates. Associates to be elected for a period of three years, and if not then graduates to be eligible for re-election. The president in an eloquent address dwelt upon the loss which the Society had sustained by the death of Prof. Sedgwick, its founder and ever-ardent supporter. The following communications were made by Prof. Clerk Maxwell: "On the proof of the equations of motion of a connected system," and "On a problem in the calculus of variations in which the solution is discontinuous."

Feb. 17.—The following communications were made by Mr.

Paley "On the name *Odysseus* signifying 'setting sun,' and the Odyssey as a solar myth." This showed that the name was most probably connected with *δύμενος ἥλιος* (setting sun) and that the details of the Odyssey were easily interpreted as a solar myth, describing the journey of the sun to the west and his return after many struggles and adventures to his ever-young bride in the east, Penelope the spinstress, *i.e.* the cloud-weaver.—"On the identity of the modern Hindu with the ancient Greek ship." A model of the former (Bengalee) was exhibited and the close coincidence in build, rig, and tackling was pointed out; and several difficulties in the allusions of classic authors to the parts of a ship were thus explained.

MANCHESTER

Literary and Philosophical Society, Feb. 18.—E. W. Binney, F.R.S., vice-president, in the chair. Dr. Joule, F.R.S., gave some further account of the improvements he had made in his air-exhausting apparatus (See NATURE, vol. vii. p. 296). "Notes on a supposed Glacial Action in the Deposition of Hematite Iron Ores in the Furness District," by William Brockbank, F.G.S. The hematite iron ore deposits in the Furness district are of two very different varieties—(1) Those filling hollows in the limestone, covered only by the post tertiary gravels and clays, and (2) Those occurring in the carboniferous limestone in veins, and large irregular cavities or "pockets." The superficial deposits (1) are more especially the subject of the present communication, as they afford, in the writer's opinion, undoubted evidence of glacial action, and of the mode in which the iron ore has been transported by its agency. "The Results of the Settle Cave Exploration," by W. Boyd Dawkins, F.R.S. Since the results of the exploration of the Settle Caves were brought before the British Association at Liverpool, in 1870, considerable progress has been made in the further investigation of the remarkable contents of the Victoria Cavern. Up to that time our researches had revealed, perhaps, the most remarkable collection of enamelled jewellery which had ever been discovered in one spot, along with broken bones of animals and the implements of everyday life, which afforded a pointed contrast to the culture implied by the workmanship of the articles of luxury. The Roman coins, and the style of workmanship of the implements, pointed out that the cave was occupied during the troublous times when the Roman Empire was being dismembered by the invading barbarians, and when Britain, stripped of the Roman legions, was falling a prey either to the Picts and Scots on the one hand, or to the Jutes, Angles, and Saxons on the other. If we stretch the limits of the occupation to the latest, they cannot be held to extend nearer to our own times than the Northumbrian conquest of Elmet (or kingdom of Leeds and Bradford) by Eadwine, in the year A.D. 616, that was preceded in 607 by the march of Æthelfrith on Chester, and the great battle near that Roman fort, celebrated in song for the defeat of the British and the slaying of the monks of Bangor. At that time the Northumbrian arms were first seen on the shores of the Irish Channel, and the fragment of Roman Britain—which had extended on the western part of our island, from the estuary of the Severn uninterruptedly, through Derbyshire and Lancashire into Cumberland—was divided, never again to be united. The Roman civilisation, which had up to that time been maintained in that district, disappeared, and was replaced by the civilisation which we know as English. The traces, therefore, of Romano-Celtic ornaments and implements from the Victoria Cave must be assigned to the period before the English conquest, before the Northumbrians conquered West Yorkshire and Mid-Lancashire. Underneath the stratum containing the Romano-Celtic or Brit-Welsh articles, at the entrance of the cave, there was a thickness of about six feet of angular stones, and at the bottom of this a bone harpoon or fish-spear, a bone bead, and a few broken bones of bear, red deer, and a small short-horned ox prove that in still earlier times the cave had been inhabited by man. A few flint flakes probably imply that these remains are to be referred rather to the Neolithic age than to that of Bronze. Below this was a layer of stiff clay, into which the committee sank two shafts, respectively of twelve and twenty-five feet deep, without arriving at the bottom. They have, however, at last penetrated it, and have broken into an ossiferous bed, full of the remains of extinct animals, similar to those which have been discovered at Kirkdale and elsewhere; consisting of the cave-bear, cave hyæna, woolly rhinoceros, mammoth, bison, reindeer, and horse. The bottom has not been reached, and the area exposed is so small that it is impossible to say whether man was

living in the cave at this time or not. The clay immediately above it is considered, both by Mr. Boyd Dawkins and Mr. Tiddeman, to be of glacial origin, and in that case this cave is the only one in Great Britain which has offered clear proof that this group of animals was living in the country before the glacial age. It may be that the remains of man may be discovered here, as in the caves of Wookey Hole, Kent's Hole, and Brixham; but this problem can only be solved by an exploration on a larger scale, which the committee hope to be able to carry on by the aid of further subscriptions, and which the British Association has thought sufficiently important to aid by a grant of 50%. The problem which they are attempting to solve, is not merely of local interest, but one which is worthy of the aid of all who care for the advancement of knowledge. "The explorations of the Victoria Cave," writes Mr. Tiddeman, "carry with them more than common interest, from the probability of making out in this district the relation of the older cave mammals (and perhaps of man) to the Glacial period. The complete absence of this fauna from the river gravels and other Post-Glacial deposits of this district, taken with the former existence of a great development of ice over the northern counties, renders it highly probable that the latter was the agent which removed their remains from all parts of the country to which it had access, leaving them only in sheltered caves. In this cave we find, above the beds containing the older fauna, a deposit of laminated clay of great thickness, differing so much from the cave-earth above and below it as to point to distinct physical conditions for its origin. Clay in all respects similar, but containing scratched stones, has been found intercalated with true glacial beds in the neighbourhood, thus rendering the glacial origin of that in the cave also highly probable. Moreover, at the back of a great thickness of talus at the entrance glaciated boulders have been found, resting on the edges of the beds of lower cave-earth containing the older mammals. All points considered, there is strong cumulative evidence pointing to the formation of the lower cave-earth at times at any rate prior to the close of the Glacial period and probably earlier. It is to be hoped that further investigations may settle these and other most important questions." The objects found in the Victoria Cave will not be removed from the country, but will be placed in a museum attached to the Grammar School at Giggleswick.

DUBLIN

Royal Irish Academy, Jan. 13.—The Rev. Prof. Jellett, president, in the chair. Mr. B. O'Looney read a paper on the contents of the Book of Leinster.—Mr. W. H. Bailey, F.G.S., read a paper on a new species of Labyrinthodont Amphibian from Jarrow Colliery, Co. of Kilkenny. This species the author said was, he believed, identical with the species referred to in Messrs. Huxley and Perceval Wright's paper on fossil vertebrata from County Kilkenny, as being "a large amphibian, closely allied to, if not identical with, the *Anthracosaurus* of the Scotch coalfield," and of which he had been shown some very fine specimens in the British Museum. He proposed to call this species *A. edgii*.

Jan. 27.—Rev. Prof. Jellett, president, in the chair. Prof. E. Perceval Wright read a report on *Hyalonema mirabilis*.

Feb. 24.—Lord Talbot de Malahide, vice-president, in the chair. The Rev. Prof. Jellett, president, read a paper on sugar-beet grown in Ireland in 1872, in which he stated that, having frequently heard it said that Ireland was not a country in which the beetroot could be successfully cultivated, he had been led to make several experiments on the subject. The results in 1871, which was a dry and sunny year, and those he had obtained in 1872, which was one of the wettest and coldest, presented very little difference. He had been furnished last year from the Albert Model Farm, Glasnevin, with four specimens of sugar-beet, in the growth of one of which the manure used was common salt; in the second case, sulphate of potash; in the third case no manure was used; and in the fourth instance, sulphate of ammonia. He had by optical experiment determined with accuracy that in the first case there was a yield of 79.99 per cent. of water and 12.72 per cent. of sugar; in the second, 80.27 of water and 13.18 of sugar; in the third, 80.60 water and 12.42 sugar; and in the last, 80.52 water and 11.85 sugar. The average of these was 80.34 per cent. of water and 12.54 per cent. of sugar. The amount of sugar thus found to be contained in the Irish-grown beet was quite equal to that in beet grown in Germany, Belgium, and France, and proved Ireland to be a country in which sugar-beet might be cultivated with advantage.

EDINBURGH

Scottish Meteorological Society, Jan. 30, half-yearly meeting.—Mr. Milne Holme in the chair.—Mr. Buchan made a statement with reference to the remarkable weather which has prevailed in this country during the past year. The specialty of that year's weather was, he said, its rainfall. The mean rainfall for sixteen years of the whole of Scotland, as indicated by the average of 55 stations, was 39.15 in. The year 1857 was a dry year, its rainfall being 8 in. less than the mean; 1858 fell below the mean by 5 in.; 1861 was 6 in. above the mean; but the rainfall of last year ran up to 15 in. above the mean, the average rainfall of the whole of Scotland during that year being 54 in. This rainfall was 38 per cent. above the mean, and there was nothing approaching it in any of the previous sixteen years. This enormous rainfall was very unequally distributed over the country. He had constructed a map of Scotland based upon the returns from 200 stations. In this map a blue line passing round the north of the Shetland Islands, cutting off the north-west fringe of Caithness and Sutherland, and then bending down southward, but returning northward again so as to pass round the north of the Hebrides, cut off a part of Scotland within which there was last year less rain than usual. Between this and another line which stretched from Shetland, took in part of Orkney, curved down round Islay, and took off a part of the Hebrides, was included a portion of the country where the rainfall did not amount to 25 per cent. above the average. Then suppose a line beginning about Peterhead, curving round so as to include Elgin, and following very closely the east watershed of Scotland, all places to the east of that line were found to have had at least half more rain than usual. Further, the country about Aberdeen and a good part of East Lothian and Berwickshire had an excess above the average to the extent of 75 per cent. Not only so, but taking some of the individual stations, it appeared that Culross, the highest the society had, stood 93 per cent. above the average; Thurston, near Dunbar, 88 per cent. above the average of thirty-two years; Jedburgh, 84 per cent. above the average; and other places fully 80 per cent. above the average. These figures showed a very remarkable distribution of the rainfall for the last year; he thought the records of meteorology had nothing like it. In Castle Gordon, Banffshire, the rainfall of last year was 5 $\frac{3}{4}$ in. above any rainfall in the previous ninety years. At Edinburgh there were sixty years' observations to go back upon, and last year's rainfall exceeded to the extent of over 4 in. any recorded within that period. With reference to the distribution of rain over the year, the fall in January was greatly in excess of the average, and it only fell below the average in April, every other month showing an excess. On the east side of Scotland, taken as a whole, every month of last year was above the average—an unprecedented fact, he thought, in Scottish meteorology. In the west of Scotland, one month was decidedly under the average, and another month stood at the average, every other month being above the average. June was a very wet month in the west. August was a drier month. September appeared rather wet, but that was due to the greater rainfall in the south, for to the north of Islay the rainfall of that month was very much under the average. As to temperature, for the first four months it was above the average; in May and September very much under the average; June about the average; July above the average, and so on; so that in this respect the year was not on the whole a very bad one. With regard to barometric pressure, he had worked out the mean of 55 stations, and it appeared that for every month, except July and August, the pressure of Scotland was under the average. Northerly, north-easterly, easterly, south-easterly, and southerly winds were above the average; and the distribution of rain was the representative of that fact, a great proportion of the rain that fell having been brought by easterly winds. The atmospheric pressure in Iceland was above the average in every month except January, and during the whole year the pressure in that island was much higher than with us. In the north of Norway the pressure was still higher than in Iceland, and showed a more irregular curve. Following out this point in other parts of Europe, it appeared that in England the pressure was under the average; in Guernsey it was under the average each month, and a similar state of matters prevailed, in Ireland, France, Switzerland, Germany, and Austria. On the other hand, in Iceland, the northern part of Norway and Sweden, in Russia, at Constantinople, at Athens, at Moscow, in the north of Africa, and in Spain, pressure was above the average, and the rainfall for the year less than the average. So far as the facts

went it did not seem to him that the rainfall of the whole globe during last year was larger than usual. In the West Indies it was a very dry year up to the beginning of November. In the United States, at least till the end of September, it was drier than usual, and in the north of Europe much drier than usual. In short it seemed that the rainfall of the year instead of being more evenly distributed, as usually happened, had been more concentrated in Scotland, England, France, Italy, south of Norway, Germany, and Austria.

PARIS

Academy of Sciences, March 3.—M. de Quatrefages, president, in the chair.—The following papers were read:—"On the Elliptical Oscillation of Solar Cyclones," by M. Faye. The paper dealt mainly with the mathematical nature of the spots, and the author gave a table in which he showed the exact resemblance which can be traced between the solar and terrestrial cyclones.—"On the Action of the Electric Current on a Mixture of equal volumes of Methene and Carbonic Anhydride," by MM. P. and A. Thenard. The authors find that the silent discharge, when allowed to act on the above mixture, produces a clear, limpid fluid, but that the spark causes an expansion of the gases sometimes accompanied by a deposit of carbon. No analysis of the liquid was given.—"On the Nature and Origin of the Solar Spots," a letter from Father Secchi, who believes that, even admitting M. Faye's cyclones, yet the cause of these must be sought in eruptions. He asserts that he did not say, as M. Faye supposed, that the spots were eruptions, but that they were produced by eruptions.—The Academy then proceeded to elect a member of the physical section in the place of the late M. Duhamel. M. Berthelot obtained 33 votes, M. Desains 23, and M. Le Roux 4. M. Berthelot was accordingly elected.—A report on a memoir by M. Kretz on the elasticity of moving machines was read.—A paper on the botanical geography of Morocco, by M. E. Cosson, followed; and next came a paper on geodetic operations, by Col. H. Levret, and one on the simultaneity of barometric variations in the high latitudes of either hemisphere, by M. J. A. Broun.—M. B. Renault presented a paper on the fructification and on the structure of the stems of *Annularia* and *Sphenophyllum*.—M. Chasles presented a paper on the trajectories of the points of a straight motion in space, by M. A. Mannheim, and a note on double curves of the sixth order, by M. Ed. Weyer.—M. L. Joulin sent a paper on saline decomposition, a paper relating to the part played by the water used to dissolve a body, when that body is precipitated by means of another.—MM. Troost and Hautefeuille sent a second instalment of their paper on the solution of gases in molten cast-iron. They find that a highly silicious iron scarcely dissolves any hydrogen.—M. Gernez presented another paper on the action of films on super-saturated solutions.—M. Pasteur presented a paper by M. J. Chautard, on the modification of the chlorophyll absorption spectrum, produced by the action of alkalies. The alkalies cause the appearance of a second band in the red.—MM. Houzeau and Renard presented a paper on the use of concentrated ozone in investigations in organic chemistry, and on "ozobenzine." The latter is a gelatinous body produced together with formic and acetic acids by the action of ozone on pure benzene.—Mr. T. L. Phipson sent a note on Anthracenamine.—M. Wurtz presented a second note on the derivatives of Tetrachloride of naphthalene, by M. Grimaux.—This was followed by M. P. Bert's ninth note on the effects of changes of barometric pressure on life. MM. P. Fischer and de Tolin sent a note on the bathymetric exploration of the fosse at Cape Breton, and M. J. Jullien a note on the respiration of the *Psammodroma*.

DIARY

THURSDAY, MARCH 13.

ROYAL SOCIETY, at 8.30.—Note on Supersaturated Saline Solutions: C. Tomlinson.—Visible Direction: Dr. Jago.
SOCIETY OF ANTIQUARIES, at 8.30.—Excavations in the Troad: Dr. Schliemann.
LONDON MATHEMATICAL SOCIETY, at 8.—On an Extension of the term *Area* to a closed curve of double curvature or Skew Polygon: R. B. Hayward.—On the Evaluation of a class of Definite Integrals involving Circular Functions in the Numerator, and powers of the Variable only in the Denominator: J. W. L. Glaisher.—Note on Normals and the Surface of Centres of an Algebraical Surface: S. Roberts.
ROYAL INSTITUTION, at 3.—Forces and Motions of the Body: Prof. Rutherford.

FRIDAY, MARCH 14.

ROYAL INSTITUTION, at 9.—Coral Reefs and their Architects: Prof. Allman.
ASTRONOMICAL SOCIETY, at 8.
QUEKETT CLUB, at 8.
ROYAL COLLEGE OF SURGEONS, at 4.—Extinct Mammals: Prof. Flower.

SATURDAY, MARCH 15.

ROYAL INSTITUTION, at 3.—On the Philosophy of the Pure Sciences: Prof. W. K. Clifford.

SUNDAY, MARCH 16.

SUNDAY LECTURE SOCIETY, at 4.—The Education of Women: Mrs. Fawcett.

MONDAY, MARCH 17.

ENTOMOLOGICAL SOCIETY, at 7.
ASIATIC SOCIETY, at 3.
LONDON INSTITUTION, at 4.—Physical Geography: Prof. Duncan.
ROYAL COLLEGE OF SURGEONS, at 4.—Extinct Mammals: Prof. Flower.

TUESDAY, MARCH 18.

STATISTICAL SOCIETY, at 7.45.
ANTHROPOLOGICAL SOCIETY, at 8.—On "Theories regarding Intellect and Instinct," and "The Concurrent Contemporaneous Progress of Renovation and Waste": George Harris.
ZOOLOGICAL SOCIETY, at 8.30.—On some Marine Mollusca from Madeira, including a new genus of the *Muricida*. Communicated by Mr. Gwyn Jeffreys: R. B. Watson.—On a specimen of *Acanthias vulgaris* and a species of *Galeus*, probably new, taken off Flinder's Island, Bass' Straits: Dr. John Denis Macdonald.—Note on the Gazelles of India and Persia, with description of a new species (*Gazella fuscifrons*): W. T. Blanford.
ROYAL INSTITUTION, at 3.—Forces and Motions of the Body: Prof. Rutherford.

WEDNESDAY, MARCH 19.

SOCIETY OF ARTS, at 8.—On certain improvements in the Manufacture of Printing Types: J. R. Johnson.
METEOROLOGICAL SOCIETY, at 7.—On some results of Meteorological Telegraphy: R. H. Scott.—On the Barometric Depressions of Jan 24, 1872: Wm. Mariott.
ROYAL COLLEGE OF SURGEONS, at 4.—Extinct Mammals: Prof. Flower.
LONDON INSTITUTION, at 7.—Travers Course (Lecture 1).

THURSDAY, MARCH 20.

ROYAL INSTITUTION, at 3.—The Chemistry of Coal and its Products: A. V. HARCOURT.
CHEMICAL SOCIETY, at 8.—On Iron and Steel: C. W. Siemens.
LINNEAN SOCIETY, at 8.—On the "Take-all" Corn Disease of Australia: Dr. Mücke.

PAMPHLETS RECEIVED

ENGLISH.—Report of the Marlborough Natural History Society.—Journal of the Iron and Steel Institute, No. 4.—Quarterly Journal of the Meteorological Society.

AMERICAN.—Annual Report of the Survey of the Northern and North-Eastern Lakes: C. B. Comstock (Washington).—Movable Torpedoes: Capt. Ericsson.—On a new Sub-Class of Fossil Birds.—On the Gigantic Fossil Mammals of the order Dinocera: Prof. O. C. Marsh.

FOREIGN.—Introduction a l'Etude de la Nutrition des Plantes, &c.: E. Morren.—Report of the Proceedings of the Meteorological Conference at Leipzig, 1873.—Cosmos, No. 1.

CONTENTS

	PAGE
HERBERT SPENCER'S PSYCHOLOGY. By DOUGLAS A. SPALDING	357
GEIKIE'S PHYSICAL GEOGRAPHY.	359
OUR BOOK SHELF	360
LETTERS TO THE EDITOR:—	
Perception in the Lower Animals.—CHARLES DARWIN, F.R.S.	360
The Sense of Smell in Animals.—W. H. BREWER	360
External Perception in Dogs	361
Sight in Dogs.—J. H. WALTERS	361
Selenium.—WILLOUGHBY SMITH	361
Brighton Aquarium, MARSHALL HALL	362
General Travelling Notes.—J. RAE	362
New Guinea.—S. J. WHITMEE	362
Flight of Projectiles.—W. HOPE	362
Glacial Action.—J. J. MURPHY, F.G.S.	362
The Feeding Habits of the Belted Kingfisher.—Prof. CHAS. C. ABBOTT	362
A PETRIFIED FOREST IN THE LIBYAN DESERT. By W. DIXON	365
PROF. FLOWER'S HUNTERIAN LECTURES	364
FAUNA OF THE NEW ENGLAND COAST	365
ON DINOCERAS MIRABILIS (MARSH). (With Illustrations.)	366
THE TROGLODYTES OF THE VEZERE (With Illustrations), III. By PAUL BROCA	366
NOTES	369
SCIENTIFIC SERIALS	372
SOCIETIES AND ACADEMIES	372
PAMPHLETS RECEIVED	376
DIARY	376