

To the number for June, 1870, M. P. P. Dehérain contributes an extremely interesting paper "On the Evaporation of Water and the Decomposition of Carbonic Acid by the Leaves of Vegetables." After mentioning the works of previous investigators, he describes the process adopted and the results obtained in his experiments. The leaves were surrounded by a very light flask with a wide and short neck, or by an ordinary test tube in the case of long and narrow leaves, like those of graminiferous plants. The difference between the weight of the globe or tube before and after the experiment gave the quantity of water which was condensed from the leaves. The author finds that the evaporation takes place quite readily, even when the atmosphere surrounding the leaves is saturated with moisture. Different species of plants evolve very different quantities of water under similar conditions, and the proportion of water seems to increase as the size of the leaf diminishes. Thus large leaves of colza evolved between 1 and 2 per cent. of their weight of water in an hour; smaller leaves 11 or 12 per cent., leaves of wheat between 70 and 90 per cent., and of rye between 90 and 100 per cent. In direct sunlight the water evaporated very much exceeds that emitted in diffuse light and in perfect darkness. Thus barley evolved 74.2 per cent. in direct sunlight, 18.0 per cent. in diffuse light, and only 2.3 per cent. in the dark. Numerous experiments are cited to show that this is not caused by heat alone, for when the tube was surrounded with cold water, or even with melting ice, the quantity of water collected was increased, doubtless owing to the more complete condensation of the water. Another series of experiments was made to determine if light of different colours had any influence on the amount of water excreted; and it was observed that yellow light, which also produces more rapid decomposition of carbonic anhydride under the influence of green leaves, is the most favourable to the evolution of water. It has recently been asserted by M. Prillieux that the variations observed when experimenting on the decomposition of carbonic anhydride by green leaves under the influence of light are influenced more by the intensity of the light than by its colour. M. Dehérain has performed numerous experiments with liquids of different colours, but of the same transparency, and shows that the yellow light is the most energetic, then follow red, blue, and finally green.—"On the Determination of Graphite in Cast Iron and Steel." By M. Boussingault. The author treats the iron with corrosive sublimate mixed with water, and heats the residue to volatilise the mercurous chloride. The black substance which is left consists of graphite, amorphous carbon, and silica. This is then heated in the air, the amorphous carbon burns off, and the loss of weight indicates the quantity of carbon in combination with the iron; the residue is next heated in oxygen, so as to cause the combustion of the graphite, which is likewise determined by loss. When the metal is dissolved in hydrochloric acid, the combined carbon is evolved in combination with hydrogen, and part of the silicon present passes into solution.

SOCIETIES AND ACADEMIES

Geological Society, June 22.—Mr. Joseph Prestwich, F.R.S., president, in the chair. Mr. Horace Pearce, 21, Hagley Road, Stourbridge, and Mr. Samuel Spruce, of Tamworth, were elected Fellows of the Society.

1. "Notes on the Lower portion of the Green-slates and Porphyries of the Lake District between Ulleswater and Keswick." By Dr. H. Alleyne Nicholson, F.R.S.E., F.G.S., lecturer on Natural History in the Medical School of Edinburgh. The author describes the characters presented by the lower part of that series of rocks, named by Professor Sedgwick the "Green-slates and Porphyries," which overlie the Skiddaw Slates in the Lake District. He notices the sections of this series in Borrowdale, on the east side of Derwentwater, between Keswick and the Vale of St. John, in the Vale of St. John, in Matteredale, in Eycott Hill, between Ulleswater and Haweswater, and in the neighbourhood of Shap. In the Borrowdale section the sequence of the rocks is given by the author as follows:—Resting on the Skiddaw slates there are (1) a felspathic trap; (2) a great series of ashes, breccias, and amygdaloids, often showing slaty cleavage and worked as slates, but with several intercalated bands of trap; and (3) a second trap. This appears to be a normal section, and is repeated, but diversified by the results of folding and faults in the other localities described by

the author, except that in the Vale of St. John the true slaty series seems to be entirely wanting.

2. "Observations on some Vegetable Fossils from Victoria." By Dr. Ferdinand von Müller and Mr. R. Brough Smyth, F.G.S. Mr. Smyth stated that the fossils, of which specimens were forwarded by him, were obtained in one of the deep leads at Haddon, near Smythesdale. No leaves have been obtained from the bed, which consists of a greyish-black clay; the fruits and seed-vessels were obtained about 180 feet from the surface, and represent a flora not very dissimilar to that now characterising some parts of Queensland. The specimens sent include the fruits of a supposed new genus of Coniferæ, described by Dr. von Müller under the name of *Spondylostrobus*. It is most nearly allied to *Solenostrobus*, Bowerbank, but its five valves are not keeled. The columella forms the main body of the fruit; and the seeds are apparently solitary. The species was named *Spondylostrobus smythii*. The remaining specimens consisted of a solitary fruit of a genus of Verbenacæ; an indehiscent compressed fruit, probably belonging to the Proteaceous genus *Helicia*; a nut nearly allied to the preceding; a large, spherical, unilocular, 3-seeded nut with a thick pericarp, perhaps from a Capparideous plant; a 5-valved capsule of an unknown genus; and fruit-valves of three other plants, probably belonging to the Sapindacæ, and perhaps allied to *Cupania*. One of the last may belong to the Meliciaceous genus *Dysoxylon*. Dr. Müller considered that these remains indicate a former flora analogous to that of the existing forests-belt of Eastern Australia.

3. "Note on some Plesiosaurian Remains obtained by Mr. J. C. Mansel, F.G.S., in Kimmeridge Bay, Dorset." By Mr. J. W. Hulke, F.R.S., F.G.S. The remains described in this note represent two new species of *Plesiosaurus*. The dorsal vertebrae of the first species are distinguished by extremely short centra, with hollow articular faces. The antero-posterior diameter of 4 centra ranges between 1 and 1.3 inch, the transverse horizontal diameter between 4 and 4.6, and the vertical between 3.8 and 4 inches. For this *Plesiosaur* the author proposes the specific name of *P. brachistospondylus*. The other species, of which the greater part of the spinal column and portions of the breast and pelvic girdles and limbs are preserved, is a long slender-necked *Plesiosaur* exceeding 16 feet in length. Its limbs are much larger in proportion to the whole length than in the typical Liassic forms of this genus; but what particularly distinguishes it from these are the massiveness of the humerus and femur, the longer size of the wing-like expansion of the postaxial border, a well-developed trochanter, and especially three articular facets at the distal end of the femur, corresponding to which the second segment of the paddle, representing the leg, contains three coequal bones. The author noticed the impression of a third bone in this segment in the matrix, in which a paddle of *Pliosaurus portlandicus* is imbedded, and the ossicle on the postaxial border of the fibula in *Plesiosaurus rugosus*. He compared the paddle-bones of the Kimmeridge *Plesiosaurus* with those of *Ichthyosauri* and of the Liassic *Plesiosaurs* and of *Pliosaurus*, he drew attention to the very close resemblance of the humerus and femur to type specimens of the femora of *Pliosaurus brachydeirus* and *P. trochanterius* in the British Museum, and traced a similar resemblance between the elements of the cnemion and tarsus, and those of the Dorchester and Portland Pliosaurian paddles. For this creature, combining a long truly Plesiosaurian neck with Pliosaurian-like limbs, the author proposed the name of *Plesiosaurus manselii*.

4. "Notes on the Geology of the Lofoten Islands." By the Rev. T. G. Bonney, M.A., F.G.S., Tutor of St. John's College, Cambridge. The author described the general appearance of the Lofoten islands, which have commonly been described as composed of granite, but which he stated really consist of gneissic rocks. The scenery of some of the islands, on which he did not land, resembled that of the Cambrian and Cambro-Silurian districts of Wales and Cumberland; and the interior of Hassel showed dark rounded fells, resembling in outline some of the softer Welsh slates. At Stokmarknes and at Melbo there is a granitoid rock of pinkish-grey colour, consisting of felspar and platy hornblende, with some mica and quartz. The Svolvaer Fjeld in Ost Vaagö shows a distinctly bedded structure in the cliffs near Svolvaer, the debris at the foot of which consist of a rock resembling syenite, and a quartzite containing a little hornblende and felspar. Bedding was also observed towards the Oxnas Fjord. The islets near this coast consisted chiefly of a granitoid rock resembling a syenite, showing traces of bedding to the west of Svolvaer. Seams and veins of quartz, hornblende,

&c., occurred in some of the islets, and these were sometimes too regular to be explained by deposition in fissures. Near the Svolvær post-office there was gneiss coarsely foliated, containing hornblende and mica, with pink orthoclase felspar. The author concluded, from his observations, that, with few exceptions, the so-called granites of the Lofoten islands are stratified, highly metamorphosed rocks, quartzites, and gneiss, generally with much felspar in the latter, and with more or less hornblende in both, and that they are inferior in position to the gneiss and schists of the mainland, and to the more slaty rocks of the southern and western parts of the same islands. He compares them with some gneiss from Dalbeg on the west coast of the island of Lewis.

5. "On *Dorypterus Hofmanni*, Germar, from the Marl-slate of Middelridge, Durham." By Mr. Albany Hancock, F.L.S., and Mr. Richard Howse. Communicated by Prof. Huxley, F.R.S., F.G.S. The material for this paper consisted of four specimens of *Dorypterus Hofmanni*, which have been discovered by Mr. Joseph Duff, in the marl-slate of Middelridge, and are believed to be the first examples of this fish which have been obtained in this country. The stratum from which they were procured is the same as that described by Prof. Sedgwick in his paper published in the Transactions of this Society (2nd series, vol. iii. pp. 76, 77). The specimens showed that the "ribbon-shaped" process mentioned by Germar is part of a peculiar exoskeleton, and that *Dorypterus* possessed ventral fins, which were situated in front of the pectorals, or "jugular." Hitherto no fishes with ventral fins other than "abdominal" in position have been known to occur earlier than the Cretaceous epoch. The tail is heterocercal, not homocercal, as Germar supposed. The dentition is not displayed in any of the specimens, and the teeth were probably small and inconspicuous; but the general structure of the fish shows it to be most nearly allied to the Pycnodonts.

6. "Observations on Ice-marks in Newfoundland." By Staff Commander J. H. Kerr, R.N., F.R.G.S. Communicated by the Royal Geographical Society. The author describes and tabulates the grooves and scratches observed by him on rock-surfaces in various parts of Newfoundland, especially Conception Bay, the neighbourhood of St. John's, and the north of Bonavista Bay. From the diversity of the direction of the markings and other considerations, he considers that they must have been produced by glaciers, and he believes that the main features of the country were much the same as at present before the glaciation took place. The author thinks that the land has not been submerged since it was freed from its coating of ice.

7. "On the Glacial Phenomena of Western Lancashire and Cheshire." By Mr. C. E. De Rance, F.G.S. The author described the general form of the ground and the preglacial condition and glacial deposits of the districts of Wirral and Western Lancashire, and draws from his observations the following general conclusions. That before and at the commencement of the glacial epoch the north-west of England was more elevated above the sea-level than at present, but afterwards gradually subsided, during which process marine denudation produced the plains of Wirral and Western Lancashire. Part of the latter has since been covered with glacial deposits 200 feet thick. The valleys running in the strike of the Triassic strata appear to have been formed by subaërial agencies. It is probable that when the glacial epoch commenced the hilly country was covered with immense glaciers, or with an ice-sheet, which, as the land sunk, reached the sea. The *High-level lower Boulder-clay* was probably produced by this land-ice. The land continued subsiding until it stood 100 feet lower than at present, submerging the lowlands of Lancashire and Cheshire to a depth of rather less than 25 fathoms, the coast-line being surrounded by an ice-foot, which received on its surface quantities of pebbles and boulders from the lake-district. These, on the breaking up of the ice-foot, were spread over the lowlands, forming the *Low-level Lower Boulder-clay*. The climate then improved, although subsidence still continued, and the sandy and gravelly deposits of the middle drift were produced; these deposits, at whatever elevation they occur, having been found in shallow water during the constant subsidence of the coast-line. The surface of the middle Drift shows traces of what seems to have been subaërial erosion, leading to the supposition that the land must have risen and suffered denudation before that depression during which the Upper Boulder-clay was deposited, at which period the climate again became extremely cold, and fresh glaciers were formed. Before the elevation of the Upper Boulder-clay the climate was greatly ameliorated.

8. "On the Preglacial Deposits of Western Lancashire and Cheshire." By Mr. C. E. De Rance, F.G.S. The author believed that after the deposition of the Esker Drift the country rose to from 200 to 300 feet higher than at present; but in the course of this elevation there was a pause, during which denudation took place, and the low plains, now covered with peat-moss, came into existence. From the consideration of the present depths of the channel between Great Britain and Ireland, the author inferred that an elevation of 200 feet would have caused the coast-line to run from the Mull of Galloway to St. David's Head; and Ireland would have been so connected with Wales as to render possible the migration of mammals, plants, and of man himself. Glaciers probably still persisted in the lake-district during the whole of this period of elevation. During a subsequent subsidence drainage became greatly obstructed, peat was formed, the sea encroached upon the land and worked its way eastward over the sea-bottom of postglacial times, a movement yet in progress. Here and there sand has begun to blow, forming dunes.

9. "Observations on Modern Glacial Action in Canada." By the Rev. W. Bleasdel, M.A., Rector of Trenton. Communicated by Principal Dawson, F.R.S., F.G.S. The author described some phenomena of ice-transport observed in Canada, especially those produced by the flood, anchor, or pack-ice produced in the rapids of the Canadian rivers. To this he attributed the entire disappearance of Crab Island in the River St. Lawrence, near Cornwall. This island occupied about an acre and a half within the memory of men now living; it has now entirely disappeared, and the water above it is gradually deepening. The island, according to the author, has been carried away piecemeal by the action of miniature icebergs, floated off by a rise in the water produced by a dam of anchor-ice below.

10. "On an altered Clay-bed and Sections in Tideswell Dale, Derbyshire." By the Rev. J. M. Mello, M.A., F.G.S. The author describes the sequence of the rocks seen in a quarry in Tideswell Dale as follows:—Beneath a thin layer of surface-soil is a bed of Toadstone, containing concretionary balls, and much decomposed above; beneath this is Toadstone in large blocks of indefinite shape, very hard, dark-green, and apparently doleritic, nine or ten feet thick, passing downwards into a coarse and much decomposed bed, partly amygdaloid, partly vesicular, about one foot thick. Beneath the Toadstone rocks, and without any sharp line of demarcation, is a thick bed of indurated red clay, three yards in thickness, presenting a regularly prismatic-columnar structure, resting on a thin bed of greenish-yellow clay, containing fragments of limestone, which covers beds of good Derbyshire marbles containing corals. The author suggests that the columnar clay-bed may perhaps be a local development of that which forms partings in the limestone near Litton Tunnel.

BRIGHTON

Brighton and Sussex Natural History Society, *Microscopical Section*. June 23.—Mr. Glaisyer, vice-president, in the chair. The subject for the evening was *Infusoria*, by Mr. Wonfor. Every one is aware that if any vegetable or animal substance is placed in water, in a few days the water will be found full of minute organisms, to which the name *Infusoria* or infusional animalcules has been given; many forms, though at first figured and described as distinct species, are now proved to be the early stages of other animals; others have been classed among another group of animals, and a larger number arranged among plants. The class *Infusoria* is much more limited than at one time supposed to be; and further, an increased knowledge might prove that many more were only the early stages of other and higher types of life. Mr. Wonfor then proceeded to point out the nature of their substance, their modes of development, increase, and propagation. So widely were they distributed that scarcely anywhere could water be found which did not contain some *Infusoria*. Many would live only in fresh water, others in salt or brackish water, while others were only to be met with in water containing decomposing vegetable or animal substances. Hence, water contaminated by sewage matter always showed certain types. While some were only to be found in particular infusions, others were common to several. Their appearance, under certain conditions, had led to theories on spontaneous generation, a much debated and debatable point; but as the atmosphere, according to Tyndall and others, appeared to be full of germs, their sudden appearance under favourable conditions was not surprising. The water in which cut flowers were kept was sure to yield some sorts; in fact, he had obtained an abundant supply of one kind from some water in which migno-

nette had been only three days. The water in bird fountains and in water bottles, if not looked after and frequently changed, would be sure to contain *Infusoria*. The rest of the evening was spent in examining the different forms of *Infusoria* brought for exhibition. Before separating it was announced that the subject for the next meeting in July, would be the "eggs of *Articulata*," i.e. of insects, &c.

PARIS

Academy of Sciences, July 4.—M. Serret presented a report upon a memoir by M. Bouquet, on the theory of ultra-elliptical integrals.—M. E. Catalan presented some remarks upon M. Darboux's note on the surface of the centres of curvature of an algebraic surface.—M. Janin read a reply to the observations of M. H. Sainte-Claire Deville, upon the variation of temperature produced by the mixing of two liquids, in which he discussed the theory proposed by M. Deville, and maintained the correctness of his own theory, according to which, he stated, the elevation of temperature of mixtures of liquids may be explained and calculated.—M. H. Sainte-Claire Deville made a few remarks upon M. Janin's paper, and also presented a third memoir on the action of water upon iron and of hydrogen upon oxide of iron, the results of which he sums up as follows:—The increase of tension of the hydrogen formed by the contact of iron and aqueous vapour is a continuous phenomenon when the tension of the aqueous vapour is caused to vary progressively without any change in the temperature of the iron; the tension of the hydrogen corresponding to an invariable tension of the aqueous vapour decreases continuously when the temperature is gradually increased; and the same laws are followed in the inverse phenomenon of the reduction of oxide of iron by hydrogen.—A note on a property of Volta's condenser, by M. P. Volpicelli, was read.—Some magnetic observations made at Makerstown, and at Trevandrum, near Cape Comorin, by M. Broun, were communicated.—An extract from a letter from M. Legrand to M. Jamin, on Deluc's thermometers, was read, in which the author stated that the difference between the temperature of the blood given by Deluc, and that now admitted, was due to the difference of atmospheric pressure at which the thermometers were graduated.—A note by M. Amagat, on the compressibility and dilatation of gases, was communicated by M. Balard.—M. Delaunay presented a note by MM. Wolf and Rayet on the light of Winnecke's Comet (Comet I. 1870) in which the authors describe their observations on the very feeble spectrum of that comet.—M. Delaunay also presented a note on the pyramids of Villejuif and Juvisy, the extremities of the geodetic base of Picard and Cassini.—M. Chapelas communicated a note on the spring of 1870, in which he noticed the phenomena of temperature, the direction of the winds, and the amount of rain observed at Paris during the months of April, May, and June of the present year.—M. Daudin communicated a memoir relating chiefly to the drought of the present year, which he ascribed to the prevalence of north-west and north-east winds, caused by some phenomena occurring in the Arctic regions.—M. Janin presented, in the name of M. Fonvielle, a notice of solar halos; and M. C. Sainte-Claire Deville a note by M. Grad on the climate of Alsace and the Vosges.—M. A. W. Hofmann presented a note on the isomers of the cyanuricæthers in reply to M. S. Cloëz.—A paper on the phosphoplatinic compounds, by M. P. Schützenberger was read, in which the author announced that he had separated the radicals from the chlorine compounds described by him in his former paper.—M. A. Béchamp communicated a paper on the carbonic and alcoholic fermentation of acetate of soda and oxalate of ammonia, in which he described the growth of microscopic vegetation in solutions of those salts, and the production of alcohol thereby, from which he inferred that the synthesis of alcohol is effected by the vegetation, although the constituents of alcohol may not be present in solution. He went further, and stated that the same vegetation produced the same effect even in distilled water!—M. Elie de Beaumont presented a note on the rocks traversed in forming the tunnel between Modane and Bardonnèche in the Western Alps, a distance of 12,220 metres (or nearly 8 miles). The paper includes a long catalogue of the rocks observed, with their depths, which will prove of great value to the geologist.—M. Descloizeaux presented a note by M. C. Velain on the position of the *Terebratula janitor* limestones in the Basses-Alpes; he referred them to the Neocomian stage, of which he regarded them as the lowest portion.—M. Duchartre communicated a note by M. E. Prillieux, containing an account of some experiments upon the withering of plants, also a note by

M. Cave on the generatory zone of the appendages of plants.—M. Chantran presented some interesting observations on the natural history of the Cray-fish, in which he described the mode of copulation of those crustaceans, their oviposition and their changes of skin. The last-mentioned phenomenon takes place fifteen times in the course of the three years during which the animals grow to their adult state.—A note by M. J. B. Noulet contained a statement that in the neighbourhood of Toulouse the house martins all build their nests in accordance with what M. Pouchet calls the old fashion, that is to say, with a small round entrance notched in the upper margin of the nest. The swallows (*H. rustica*), on the contrary, according to the author, build nests resembling those described by M. Pouchet, and M. Noulet evidently considers that the latter naturalist has mistaken the nests of one bird for those of the other. Two physiological papers were communicated; one on the vitality of the vaccine virus, by M. Melsens; the other on an unequal production and difference of composition of the milk in the two breasts of the same woman.

PHILADELPHIA

Academy of Natural Sciences, February 1.—Dr. Ruschenberger, president, in the chair. The following paper was presented for publication: "Note on the relations of *Synocladia*, King (1849), to the proposed genus of *Septopora*, Prout (1858)." By F. B. Meek and A. H. Worthen.

March 1.—Dr. Ruschenberger, president, in the chair. The following paper was presented for publication: "Descriptions of new species and genera of fossils from the Palæozoic Rocks of the Western States." By F. B. Meek and A. H. Worthen. Prof. Leidy directed attention to a specimen received from the Smithsonian Institution for examination, which he said was the upper two-thirds of the right humerus of one of the extinct giant sloths, and was obtained in Central America by Capt. J. M. Dow. It agrees so nearly in form, proportions, and size, with the corresponding portion of the arm-bone of the *Mylodon robustus* of Buenos Ayres, as described and figured by Prof. Owen, as to render it probable it may belong to the same species. The specimen is unworn, black, not petrified, has no adherent rock matrix, and looks as if it had been obtained from alluvial mud. The interior of the shaft presents a long wide cavity, which might be viewed as the medullary cavity were it not that all the known extinct giant sloths have the limb bones solid. There would perhaps have been less hesitation in deciding as to the character of the cavity, were it not that comparatively recently a reverse condition was observed in a bone where it would not have been anticipated. A short time ago Mr. James Orton, of Rochester, N. Y., submitted for examination a collection of bones from the valley of Quito, Ecuador, S.A. The specimens were obtained at an altitude of 10,000 feet, and from Mr. Orton's account, were imbedded in a cliff of unstratified silt 400 feet in height. Among the bones, besides those of horses, llamas, &c., there was the femur apparently of a Mastodon, but solid or devoid of a medullary cavity. If the hollow interior be the natural condition of the *Mylodon*-like humerus under inspection, it would not belong to *Mylodon robustus*. Independently of the cavity indicated, the bone is sufficiently different in size and form to indicate a different species from the *Mylodon Harlani* of North America. The humerus from Oregon, described by Perkins (*Am. Jour. Sci.* 1841, xlii. 136), and referred to the latter by Prof. Owen, is not only much larger, but it is of greater breadth in relation with its antero-posterior diameter. The fragment of a humerus from Big-Bone-Lick, Kentucky, represented in fig. 3, plate xiv. of my "Memoir on the Extinct Sloth Tribe," is somewhat smaller than the corresponding part of the Oregon specimen, and is more compressed or wider in comparison with the antero-posterior diameter. Prof. Leidy further observed that there appeared to be a point of some significance in the anatomy of the mandible of *Dromatherium sylvestre* worthy of attention, though the appearance may turn out to be a deceptive one. Prof. Emmons had discovered three isolated rami of mandibles of this most ancient of American mammals in the triassic coal of North Carolina. Of the specimens, one is represented in fig. 66 of Emmons's *American Geology*, repeated in outline in fig. 650 of Dana's *Geology*. Another specimen Prof. Emmons presented to the Academy, and is contained in our museum. The point of interest to which reference is made is the apparent absence of a condyle. This process may have been lost, but in the two specimens seen by Prof. Leidy—that figured by Prof. Emmons, and that preserved in our museum—a separation of the process is not obvious.

March 8.—Dr. Carson, vice-president, in the chair. Prof. Leidy made the following remarks:—The reptilian remains from the cretaceous formation near Fort Wallace, Kansas, presented to the Academy by Dr. T. H. Turner, and described by Prof. Cope under the name of *Elasmosaurus platyurus*, belong to an Enaliosaurian, as originally suggested by Prof. Cope. The anatomical characters of the different regions of the vertebral column, those of the shoulder and pelvic girdles, and of the preserved portions of the skull and teeth, are decidedly Plesiosaurian.

March 15.—Dr. Ruschenberger, President, in the chair. The following paper was presented for publication:—“Cross Fertilisation and Law of Sex in Euphorbia.” By Thomas Meehan. Mr. Charles Darwin’s interesting observations on cross fertilisation have opened a new world for original discovery. The list of plants which seem to avoid self-fertilisation is already very large. I think *Euphorbia* may be added to the number. Certainly this is the case with *E. fulgens*, Karw. (*E. jacquina-flora*, Hook) which I have watched very closely in my greenhouse this winter. Several days before the stamens burst through the involucre, which closely invests them, the pistil with its ovarium on the long pedicel has protruded itself beyond, exposed its stigmatic surfaces, and received the pollen from the neighbouring flowers. The way in which the pollen scatters itself is curious. In most flowers a slight jar or a breath of wind will waft the pollen to the stigmas, but I have not been able to notice any to leave the flowers in this way; for as soon as the anther cells burst, the whole stamen falls from its filament-like pedicel and either drops at once on the pistils of other flowers or scatters its pollen grains by the force of the fall. This *Euphorbia* also furnishes another contribution to the theory of sex which I have advanced. The plan on which the male and female organs are formed is evidently a common one; and the only reason why some flower-heads have a pistil in the centre, and others are wholly staminate, is, that there is greater axial vigour when the female flower is formed. Whenever the common peduncle (below the scarlet involucre) is weak, a pistil never appears in that head of flowers. A few which seem strong neither have them, but the great majority of the strong peduncles are those which bear the female blossoms. Another interesting fact is that the number of male flowers is less in those heads which also bear a female, than in those which are wholly staminate. This seems to add to the point I made in my paper on *Ambrosia*, that after the flowers have been partially formed in embryo, and before the sex has been finally determined, the female flower, being primordially the stronger, has the power of absorbing the males or their partially formed elements into its system. It is certainly remarkable that in both these instances the number of male flowers should decrease in proportion to the existence or vigour of the central female one. The male and female flowers of *Euphorbia fulgens* are formed much alike. The female occupies the centre, and seems really but a prolongation of the main stem, on the top of which is an articulation from which the ovarium springs. The capsula readily falls from this articulation when mature. From the base of the female central peduncle spring weaker peduncles, colourless, appearing indeed almost like filaments, articulated at about the same height as the female, only above the point bearing a short filament and anther—the caduceous part before referred to. No one can fail to see the correspondence of plan in these different parts, and I think that nothing but the favourable position in the direct line of axial vigour made the central flower a female one. Cases occasionally occur in which a tolerably strong head of wholly male flowers will develop the central axis into a pedicel almost as long and vigorous as those which bear female flowers. But the flow of vital force—if I am correct in using this term—not being quite sufficient, the final goal of natural perfection in the female form was not reached. These cases do not occur often, but are well worth looking for, as they show so clearly the dividing line between the forces which govern the male or female sex.

March 22.—Dr. Carson, vice-president, in the chair. The following paper was presented for publication: “Descriptions of Fossils collected during the U.S. Geological Survey under the charge of Clarence King.” By F. B. Meek.

April 5.—Dr. Carson, vice-president, in the chair. Prof. Leidy made the following remarks on “Discosaurus and its Allies.” The body of the last vertebra in the series of caudals belonging to the Kansas saurian, described by Prof. Cope under the name of *Elasmosaurus*, has the length less than the depth or breadth, which latter is the greater diameter. It is moderately

contracted towards the middle, the sides below the neural arch and the surface below the costal articulations being fore and aft concave, and bounded in front and behind by an acute margin from the articular ends. A ridge extends fore and aft between the chevron articulations, and the included surface is concave, and exhibits a single lateral venous foramen. The costal articular processes project from the middle of the side of the body, reaching nearer the fore than the back end of the latter. They are transversely oval, about three-fourths the length of the body, and the height about half. They form a deep concavity, with acute margins extending peripherally. The articular ends of the body are transversely oval and defined from the intermediate portion of the latter by an acute everted margin. A short distance within the position of the latter the surface is marked by a narrow groove, and within the circle of this groove the surface projects in such a manner as to appear like a distinct disc or epiphysal plate applied to and coössified with the body. The surface of the disc is convex at the periphery and moderately concave towards the centre. The articular surface beyond the groove defining the disc appears as an everted ledge, and the triangular articular facets for the chevrons appear as deflections of the ledge. The extension of the latter inferiorly is greater at the posterior extremity of the body than at the anterior extremity, thus producing a larger provision of surface in that position for the articulation of the chevron. The neural arch in the specimen has apparently been so much laterally compressed, that its original condition cannot be ascertained.

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- ENGLISH.—Lay Sermons, Addresses, and Reviews: By T. H. Huxley. (Macmillan and Co.)
- FOREIGN.—(Through Williams and Norgate)—Essai de Philosophie Positive au xix^{me} siècle: A. d’Assier.—Ueber die Chemie des Weines: Dr. C. Neubauer.—L’ancienneté de l’homme: Le Marquis de Nadaillac.—Description physique et naturelle de l’île de Crète, Vols. 1 and 2, with Atlas, Tome i. and ii.: V. Raulin.—Cryptogames vasculaires du Brésil: A. L. A. Féc. Mémoires de l’Académie impériale des Sciences de St. Petersburg, vii^{me} série, Tome xv., No. 2, Flora Caucasi, part 1: F. J. Ruprecht.

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