and possessing two nuclei, but showing no signs of division, and others, again, which present at one end a small bud, the size of which increases until it equals that of the mother-cell, when one of the nuclei passes into the daughter-cell, and as the division between the two cells becomes more distinct, the appearance described by M. Gerbe is produced. M. van Beneden could could not, however, detect any cell-membrane.

The development of the ovule then goes on much as described by M. Gerbe, one of the daughter-cells being enlarged much more rapidly than the other, and acquiring a vitelline character. When it has attained a diameter of 0·015—0·018 millimetre, a cell-membrane (vitelline membrane) may be detected, which, however, only covers the larger cell. With these ova others are found in which the smaller or polar cell is no longer to be distinguished, but which present at one point a depression representing the surface to which it was attached: the ova when deposited never present the least trace of the polar-cell; but after oviposition the ovaries contain numerous cells, resembling the original mother-cells, which are really the polar-cells thrown off from the mature ova. These, M. van Beneden believes, *become the mother-cells of a new set of ovules.* He supports this opinion by several instances derived from crustacea of other groups, such as *Caligus, Calvella, Lernanthropus, Congericola, Anchorella, Lernæopoda,* &c., in which analogous phenomena occur.

M. van Beneden remarks, that in the ova of *Sacculina* segmentation of the whole contents of the ovum takes place, and he describes the process. This, as he says, excludes the idea of a cicatricula, which occurs only where a great part of the nutritive material exists outside the protoplasm of the ovicell, as in birds. Hence there can be no comparison between the egg of the *Sacculinæ* and that of birds, nor has it any special analogy to that of the *Arachnida* and *Myriopoda.*

SOCIETIES AND ACADEMIES

LONDON

Ethnological Society, December 21.—Prof. Huxley, LL.D., F.R.S., president, in the chair. An ancient calvaria, which has been assigned to Confucius, was exhibited and described by Prof. Busk, F.R.S. This calvaria was formerly set in gold, richly ornamented, and mounted on a tripod, probably for use as a drinking vessel. It was taken from the Emperor of China's Summer Palace at Peking. The author has discovered four figures upon the skull in faint relief; that upon the frontal portion being the letter A in a Tibetan form of Sanskrit, referable to about the seventh or eighth century of our era. The skull was evidently that of a male advanced in age, but all the evidence tended to show that it ought not to be attributed to Confucius. The President suggested that those portions of the skull which now appear sculptured in relief might have been originally covered with some solid material which would have served as a protection, while the surrounding surface was worn down by constant handling. The Australians still use calvariæ, ornamented in a like manner. Mr. Fergusson alluded to the character of the workmanship displayed by the ornamentation, which had been barbarously removed. He regarded the skull as that of a distinguished personage—either a friend or a foe of some Chinese emperor; and thought that its use as a drinking-cup was supported by a passage in "Herodotus." Mr. Mummery, the present owner of the calvaria, explained the curious manner in which it came into his possession. Dr. Campbell referred to the Buddhist practice of using human thigh-bones as trumpets for calling to prayers. Mr. Donovan regarded the skull, from its small size, as belonging to an uneducated female.—At the same meeting Major Millingen, F.R.G.S., read a long paper on the "Koords and Armenians," in which he gave his reasons for identifying the modern Koords with the ancient Karduks mentioned by Xenophon. The language spoken in Koordistan is entirely different from either Persian or Turkish, and is said to be divided into several dialects. The Koords were described as a rapacious and faithless people, rejoicing in plunder and slaughter; and not the least interesting part of the paper was the description of a peculiar system of female brigandage. The Koordish race were said to be remarkably handsome, and to exhibit a great variety of complexion; a dark skin, with black hair and black eyes, is the most common, but light hair and blue eyes are also to be seen.

Statistical Society, December 21.—Mr. Newmarch, F.R.S., president, in the chair. A Report on the Seventh International Statistical Congress at the Hague was read by Mr. Brown, after which Mr. R. H. Inglis Palgrave read a paper "On the House Accommodation of England and Wales." Mr. Palgrave commenced by stating that the population of England is now probably better housed than at the commencement of the century. The average number of inhabitants to a house has slightly diminished since 1801. Mr. Palgrave continued to point out that, covered by a general average, which appeared to show ample accommodation, were great inequalities. The information obtained in the English census inquiries scarcely gives the means of tracing the subject further; but the last census in Scotland showed that one-third of the population lived each family in dwellings of only one room; another third in dwellings of two rooms; only the remaining third being lodged with comfort and decency. Mr. Palgrave showed by an analysis of Mr. Dudley Baxter's calculations, that the lowest section of the population in England was nearly twice as closely packed as the general average, in dwellings more than proportionately inferior; and by a reference to the Report on the Employment of Children and Women in Agriculture, that the condition of some rural districts apparently well provided for was scarcely superior to that of Scotland. Mr. Palgrave concluded by proposing that the census inquiry for 1871 should include more details on the house accommodation of England, Wales, and Scotland, thus to ascertain present deficiencies, and to assist those who desire to remedy the evils arising therefrom. The following gentlemen were elected Fellows, viz.:—Sir Massey Lopes, Bart., M.P., Hon. H. N. D. Beyts, Dr. Macaulay, Messrs. J. O. Chadwick, A. H. Smee, C. Inglis, M.D., Hammond Chubb, S. Ingall, and James M. Davies.

Institute of Actuaries, December 21.—Mr. S. Brown, president, in the chair. The following gentlemen were elected members, viz.:—Fellows, Messrs. Cornelius Walford and Joseph J. Dymond; and Associates, Messrs. A. C. Waters, Ainslie, Talon, E. J. Sims, jun., Henry Jeula, James D. Hobson, J. Ashton, J. H. Elder, and Joseph Burne. Mr. J. B. Sprague, M.A., read a paper "On the rate of mortality prevailing among assured lives, as influenced by the length of time for which they have been assured."

EDINBURGH

Royal Society of Edinburgh, December 20.—Professor Kelland, president, in the chair. The Keith Prize for the biennial period ending May 1869 having been awarded by the Council to Professor P. G. Tait, for his paper "On the Rotation of a Rigid Body about a Fixed Point," the medal was formally delivered to him, after which Professor Kelland, in making the presentation, said he had great pleasure in accompanying it with the sum of £57 0s. 10d. He briefly referred to the manner in which Professor Tait was applying the method of quaternions, and mentioned that he was now putting on a more solid basis what they might call the mechanical sciences. On every account Professor Tait was entitled to the honour which had been conferred upon him, and he had no hesitation in saying that this was only the first of a series of successes.— Mr. Archd. Geikie read a paper "On the Geological Structure of some Alpine Lake Basins." In this paper the author reviewed the arguments which had been adduced by the geologists of Switzerland to prove that the great lakes of that country are essential parts of the architecture of the Alps. He stated that this view was untenable, for the lakes, instead of coinciding with the foldings and fractures of the rocks, ran directly across them. He entered in some detail into the geological structure of several of the Alpine lakes, particularly of the Lake of the Four Cantons, with the view of showing that between the contortions and dislocations of the rocks and the trend of the lake there is no ascertained connection. By a series of diagrams he pointed out how vast an amount of rock had been removed from the site of the lake and the adjacent mountains, and that it was physically impossible that any remnant of the original surface at the time when the rocks were folded could now remain. Particular attention was called to the fact that the greatest of the known dislocations of the Alps—the fracture which has brought down the miocene against the older tertiary and secondary rocks—has not given rise to lakes and valleys, but actually crosses them, as at the lakes of Geneva, Thun, and Lucerne, and in the valleys of the Rhine and Linth. After combating the explanation by which the lakes are referred to

general and special movements of subsidence, the author dwelt upon the intimate connection between the Alpine lakes and the innumerable rock basins of the rest of the northern hemisphere. This connection, he said, could hardly be accidental. It pointed to some general cause which had been at work during a recent geological period, and he could not doubt but that this general cause was the thick mantle of ice which, from independent evidence, can be shown to have enveloped a great part of Europe and North America. The idea of the erosion of lake basins by the grinding power of land ice had been first propounded by Professor Ramsay, and there seemed every reason to believe that this view would come eventually to be accepted even by the geologists of Switzerland. — Professor Turner read a preliminary notice of the great finner whale recently stranded at Longniddry. It was so seldom that one of these large whales found its way to our very doors, and there were still so many unsolved problems to be worked out in connection with the structure and classification of the larger cetacea, that he gladly availed himself of the arrival of the rare visitor to devote such time as he could spare to the study of the huge creature. The length of the animal, he said, measured from the tip of the lower jaw to the end of the tail, 78 feet 9 inches. The girth of the body, immediately behind the flipper, was 45 feet. Its girth, in line with the oval orifice, was 28 feet, whilst around the root of the tail it was only 7 feet 6 inches. The inner surface of the lower jaw close to its upper edge and on the border was concave, and sloped inwards so as to admit the edge of the upper jaw within it. The length from the angle of the mouth to the top of the lower jaw, along the curved border, was 21 feet 8 inches. The dorsum of the upper jaw was not arched in the antero posterior direction. It sloped gently upwards and backwards to the blow holes, from which a low but readily recognised median ridge passed forwards on the back, gradually subsiding some distance behind its tip. On each side of this ridge was a shallow concavity immediately in front of the blow holes, the ridge bifurcated and the forks passed backwards, enclosing the nostrils for several inches, and then subsided. The outer borders of the upper jaw were not straight, but extended forward from the angle of the mouth for some distance in a gentle curve, and then rapidly converging in front formed a somewhat pointed tip. Their rounded palatal edges fitted within the arch of the lower jaw. The transverse diameter of the upper jaw over its dorsum between the angles of the mouth was 13 feet 3 inches. From the blow holes the outline of the back, curved upwards and backwards, was uniformly smooth and rounded, and for a considerable distance presented no dorsal mesial ridge. From the tip of the lower jaw to the anterior border of the dorsal fin, the measurement was 59 feet 3 inches. Behind the dorsal fin the sides of the animal sloped rapidly downwards to the ventral surface, so that the dorsal and ventral mesial lines were clearly marked, and the sides tapered off to the tail. The ventral surface of the throat, and the sides and ventral surface of the chest and belly, were marked by numerous longitudinal ridges and furrows. When he first saw the animal, the furrows separating the ridges were not more than from ¼ to ⅜ of an inch broad, whilst the ridges themselves were in many places 4 inches in breadth; but as the body began to swell by the formation of gas from decomposition, the furrows were opened up, became wider and shallower, and the ridges underwent a corresponding diminution in breadth. The flipper projected from the side of the body thirty-one feet four inches behind the top of the lower jaw, and fourteen feet behind the angle of the mouth. It curved outwards and inwards, terminating in a free, pointed end. The distance between the two flippers, measured over the back between the anterior borders of their roots, was eighteen feet six inches. On the dorsum of the beak and of the cranium, on the back of the body, and for some distance down its sides, the colour was dark steel, amounting in some sights almost to black. On a line with the pectoral flipper the sides were mottled with white, and on the ventral surface irregular, and in some cases large patches of silver grey or whitish colour were seen. The dorsal fin was steel grey or black, except near its posterior border, where it was a shade lighter and streaked with black lines. The anterior of the lobes of the tail, its upper surface near the root and for the anterior two-thirds, were black. The upper surface of the flipper was steel grey, mottled with white at the root, at the tip along its posterior or internal border and on the under surface white patches were seen, on the upper surface near the tip, and here they were streaked with black lines running in the long axis of the flipper. White patches also extended from the root of the flipper to the adjacent parts of the sides of the animal. The outside of the lower jaw was black, whilst the inside was streaked with grey and brown. The tongue of the whale was of enormous size. The dorsum was comparatively smooth in front, but at the posterior part it was elevated into hillocks, which were separated by deep furrows. The baleen had a deep black colour, and consisted on each side of the plates which projected from the palate into the cavity of the mouth. The plates were arranged in rows—370 were counted on each side—which lay somewhat obliquely across the palate, extending from near the base of the great mesial palatal ridge to the outer edge of the palate. The plates diminished in size so much that at the tip, where the two sets of baleen became continuous, they were merely stiff bristles. He was happy to state, however, that the skeleton had been secured by the directors of the Museum of Science and Art in this city, who had granted him permission to examine it as soon as it was in a fit state. Prof. M'Donald gave it as his opinion that the whale which stranded at Longniddry was a water-breathing animal, and not an air-breathing animal.—The other paper read was "On the Aggregation in the Dublin Lying-in Hospital."

MILAN

Royal Lombardian Institute, November 11.—Professor Schiaparelli communicated a note upon a recent pamphlet by Signor Gaetano Baratta, proposing a method for the geometrical trisection of any given angle. He showed by a table of measurements that the first angle obtained by M. Baratta's rule is always greater than one-third of the primary angle.—Professor Emilio Villari presented a memoir on the electro-motor force of palladium in gas batteries. The author was led by the consideration of the great attractive force of palladium for hydrogen, and the fact that the hydrogen thus held by palladium possesses great chemical activity, to apply it to the construction of gas batteries. He described the mode in which he constructed his batteries and the experiments performed with them, which showed very complex actions, but proved that a palladium-element has a greater electro-motor force than one of Grove's gas-elements, because hydrogen in contact with palladium is considerably more oxydisable than hydrogen in contact with platinum. This electro-motor force is still further increased if the palladium which is in contact with oxygen (*i.e.*, the positive electrode) is oxydised.—A new determination of the orbit of Clytie (asteroid 73), with ephemerides, by Signor Giovanni Celoria, was communicated by Professor Schiaparelli.

MONTREAL

Natural History Society, November 29.—Principal Dawson in the chair. Mr. Billings read a paper on the genus *Scolithus*, and some allied Fossils. The fossils known under the names of *Scolithus* and *Arenicolites* were described as consisting of cylindrical or rod-like bodies, which penetrate the layers of sandstone perpendicularly downwards, to a distance varying from a few lines to two or three feet. There are several varieties, the most common of which has the rods from one-twelfth to one-fourth of an inch in diameter; in another more rare form they have at the surface of the beds a wide trumpet-shaped expansion, two or three inches across, but taper to a point below, where they are, in general, more or less curved. Under certain circumstances, they can be entirely separated from the rock, and then present the appearance of simple cylindrical or conical rods of sandstone with no internal structure. All the varieties are more or less distinctly marked by a series of oblique annulations—a character which Mr. Billings thought to be of importance, as it seemed to show they were all members of one family of organisms. So long as these fossils were only known by specimens exhibiting no internal structure, it was impossible to decide to which division of the animal or vegetable kingdom they belonged. The Geological Survey had, however, ascertained that the Potsdam formation included a considerable deposit of limestone, in which the same fossil forms were found, with the internal structure beautifully preserved. By these it was proved that they were not the casts of worm-burrows, but sponges. Mr. Billings believed that these ancient sponges, or at least many of them, lived in the sand or soft ooze of the ocean's bottom, with their sometimes wide and trumpet-shaped mouths either even with or a little elevated above the surface. During the discussion that followed the reading of the paper, Dr. Dawson said that if Mr. Billings was right, it would appear that in the seas of the earlier ages protozoic life had the preponderance. In reply to a question by Mr. Whiteaves, Mr. Billings said that siliceous spiculæ

were found in great abundance in association with these sponges. They were generally of an elongated pyriform shape (the "acerate" form of Bowerbank). He supposed they were originally calcareous, but had become siliceous during the progress of fossilisation.—The next communication was from Dr. Carpenter upon "Different modes of Computing Sanitary Statistics, with special reference to the opinions of Mr. Andrew A. Watt." Upon this subject, which related exclusively to the statistics of population of the city of Montreal, there was an animated discussion.

NORWICH

Naturalists' Society, November 30.—The Rev. J. Crompton, the president, in the chair. Mr. Southwell read a long and interesting paper "On the Flight of Birds." The seeming impossibility of a heavy body supporting itself in mid-air, gliding along, changing its direction at will, apparently violating all the known forces of nature, is sufficiently astonishing to attract the attention and engage the researches of scientific men; and yet, till of late, the subject has been neglected, or the theories formed to account for so remarkable a phenomenon have been altogether erroneous. The great stumbling-block to the arrival at the truth seems to have been the very natural idea that buoyancy was the first essential to flight, whereas it is now shown, that so far from being an essential, it is an actual impediment. Hunter discovered the presence of air-cells in the bones and dispersed over various parts of the bird's body, and it was believed that by this means heated air was used to render them lighter, and that it was possible by thus inflating the body to increase the bulk, at the same time decreasing the weight; forgetting that additional bulk without a corresponding increase of weight would but enlarge the surface presented to atmospheric resistance, thereby rendering the too buoyant body of the bird the sport of every wind that blows. Sir Charles Bell follows up this idea of excessive lightness; but Captain Hutton, in a paper on "The Birds inhabiting the Southern Ocean," shows that in order to bring the specific gravity of the albatross to that of the atmosphere, the air-cells in its body should contain 1,820 cubic feet of air heated to 108 degs.—equal to a sphere of more than 15 feet in diameter; or, in other words, they must be 1,200 times the size of the body itself, "which," he adds, "would give it, when flying, an aldermanic appearance which I have never observed." It is obvious, therefore, that the air-cells are not intended to aid the bird in flight by rendering it lighter than the air itself. After referring to the opinions of Sir Charles Bell, Mr. Southwell gave an account of the principles enunciated in France by M. de Lucy, who has shown that three great properties are absolutely essential in all winged animals—(1) weight, or the force of gravity; (2) surface, or the area presented to atmospheric resistance; and (3) force, or the power of projection. Without weight the object might float, but it could never fly, there would be no resisting force to form a fulcrum to its movements, and it would, in fact, be part of the atmosphere and subject to it, wafted hither and thither without the power of resisting. The bird being elevated in the air, possesses, in virtue of its weight, a force always exerting itself in a downward direction, thereby producing motion, which, if it has the power to control, will prove the mainspring of its flight. In order to counteract this downward motion, surface is called into request. The expanded wing is presented to a column of air perpendicular to itself, and a new law of nature comes into operation—that of atmospheric resistance. This is not sufficient to counteract the force of gravity without some mechanical action on the part of the bird, but it would in a great measure break the force of the fall, causing it to descend in a series of zigzags, as a sheet of paper falls from a balloon. We should expect to find the surface increase in proportion to the weight of the animal; but, strange to say, it has been shown by M. de Lucy that the extent of surface is always in an inverse ratio to the weight of the winged animal. The heavier the animal, the smaller its wing surface, referred to a fixed standard. This is shown remarkably in flying insects; the body is very light, but the wing surface is enormous. The bird would soon be brought down from mid-air but for the muscular power of depressing the expanded wing forcibly and rapidly so as to cause the elastic column of the air beneath to rebound with sufficient force to destroy the remaining effects of gravity and so to equalize all the forces as to leave the bird ready to pursue its course at will. The most striking thing about the skeleton of a bird is its great lightness combined with strength. By a beautiful arrangement, the greatest power is given to the wings. The front part of the wing, that first presented to the air in forward flight, is stiff and unyielding, well adapted for cutting its way through the air; the other feathers become weaker and more pliable as they are placed nearer to the body of the bird. The feathers, which are divided into two portions by a nearly central shaft, overlap each other, the anterior web, which is the strongest and stiffest, being uppermost. When the down stroke is delivered, the wing presents to the air an impenetrable and unyielding surface, but when the corresponding up stroke is made, the yielding posterior web of each feather becomes depressed by the resistance of the air above, thus separating the feathers so as to allow of the free passage of the air; by this means giving the maximum amount of force to the down stroke, which would otherwise be neutralised by the resistance of the up stroke. But this is not all; the under surface of the wing is more or less concave, while the upper surface is convex. It is obvious, therefore, that when the up stroke is made, the air will rush off and through the wing in all directions, but when the motion of the wing is reversed, the air will be gathered up in its hollow, and the resistance immensely increased. By a wonderful contrivance, the same stroke which elevates the bird gives it a forward motion also. Mr. Southwell then gave an elaborate description of the mode in which forward motion is effected, from the Duke of Argyll's work, "The Reign of Law." Those birds with very long and pointed wings possess the greatest powers of flight; as, for instance, the sharp-winged martin for speed, and the long-winged albatross for both speed and endurance. The power of turning in flight appears to be the result of an involuntary effort, as we turn or incline to the left or right in walking. It is a matter of considerable difficulty to obtain reliable data as to the actual velocity with which birds travel through the air. The flight of a hawk, when its powers are fully exerted, has been calculated at 150 miles an hour; the usual flight of the eider duck at the rate of 90 miles an hour. Audubon estimates the flight of the American passenger pigeon at a mile a minute, and the carrier pigeon to possess, probably, an average of 50 or 60 miles in a long flight, although over short distances, as when pursued by a hawk, its speed is much greater. The flight of rooks "going home to bed with full stomachs," and taking it easy, Major Holland estimates at about 26 to 30 miles an hour; the speed of the albatross whilst coursing in company with a ship, he reckons at about 90 miles an hour. The flight of other birds, such as the swallow, the eagle, and the peregrine falcon, has been estimated as of much greater speed. The power of passing with ease and rapidity over long distances is of vast importance to birds living in communities. Rooks, for instance, would soon exhaust the supply of food in their own neighbourhood. Mr. Stevenson is satisfied that the guillemots and gulls seen feeding in Yarmouth and Lowestoft Roads in summer, come from the great nesting-places on the Yorkshire coast; and Mr. Yarrel states, on the authority of Dr. Jenner and the Rev. N. Thornbury, that the domestic pigeons about the Hague "make daily marauding excursions at certain seasons of the year to the opposite shore of Norfolk, to feed on vetches—a distance of forty leagues." Mr. Southwell quoted many instances of the extraordinary power of birds to endure protracted flights; and concluded by saying that man with all his boasted skill has not been able to construct a machine to enable him to navigate the air, and, even with the bird before his eyes, he has failed to learn its lesson. In the discussion which ensued, Mr. Southwell said he hoped his paper would attract attention to the subject of the flight of birds, as very little was known about it; and the very fact that in modern days men attributed the powers of flight in birds to the air-cells being filled with hot air, showed how little the principles of flight must have been considered.

PARIS

Academy of Sciences, December 20.—M. E. Becquerel presented a note by M. J. M. Gaugain on the electromotive forces developed by platinum in contact with various liquids. The author stated that when two platinum electrodes, *not platinised*, have remained in an acidulated liquid until they furnish no sensible current, if one of them be washed in distilled water and dried with blotting paper, it becomes negative on being again placed in the liquid. The opposite effect is produced with solution of potash. The effect in the latter case is much greater when the electrodes are platinised. The author ascribed this phenomenon to a modification of the electrodes consisting in a superficial adherence set up between the platinum and the acid or alkaline substance. He also remarked upon the difference of function in platinised and non-platinised electrodes,

and stated that with these substances as opposite electrodes an electromotive force, equal to more than one-fourth of that of a Daniell's couple, is at first developed, but that this gradually diminished. This was ascribed by him to the slow modification of the electrodes in opposite directions. According to the author, the modification in question takes some time for its production, but it is also long persistent; and he indicated that this property of platinum electrodes may be applied to the determination of the acid or alkaline nature of liquids, even when these are so dilute as to have no action upon test-papers.—M. Peligot read a note "On the presence of potash and the absence of soda in most plants." He maintained, as on former occasions, that soda is not necessary for the nutrition of plants, and cited experiments made with potatoes cultivated close to and far from the sea, which showed no difference of constituents; soda was always absent. M. Boussingault remarked upon this communication that he had already shown, by analysis, that soda was in many cases far inferior in importance to potash, but he thought the question was especially a geological one, the composition of the ground appearing to be of much importance. M. Payne considered that spectrum analysis should be made use of in this investigation.—A discussion was raised by M. Bertrand on M. Carton's note for the demonstration of the proposition that the three angles of a triangle cannot be less than two right angles. M. Bertrand explained M. Carton's proposed demonstration.—M. Faye called attention to a passage in Genesis, in which mules are mentioned as existing in the time of Abraham, and suggested that where there were mules the horse must have been known. MM. Roulin and Milne-Edwards remarked that the passage cited by M. Faye probably related to the Hemiornis.—The following papers were also communicated:—A note by M. Bulliani on the Constitution of the Ovum in the *Sacculinæ;* a note showing that œdema does not always result from the mere ligature of vessels, but that this must be accompanied by paralysis of the vaso-motor nerves, presented by M. Claude Bernard on the part of one of his pupils; a second note by M. Perizeux on the Secular Acceleration of the Movement of the Moon; a note on the Modifications produced in Skins by the operation of Tanning, presented by M. Boussingault on the part of one of his pupils; and a note by M. Blaserga on the Graduation of Galvanometers.

PRAGUE

National Museum of Bohemia, Natural Sciences Section, Nov. 20.—Prof. T. Krejci gave a *résumé* of his researches on the Permian strata at the foot of the Riesengebirge, on the northern frontier of Bohemia. The most interesting district is that near Schwadowitz. The Permian strata and the cretaceous grit here form a crest about 2,000 feet in height, the Faltengebirge, which fills up the space between the two masses of the Riesengebirge and the Adlergebirge. Its elevation is attributable to an extensive fault situated at its southern foot; this same fault having occasioned the denudation of the coal strata of Schwadowitz which have been actively worked for some years past. The latter belong partly to the carboniferous formation, partly to the Permian, which possess a good number of species in common, just as in the basin of Schlan, near Prague, thus indicating a gradual transition from the one of these formations to the other. To the south of the Schwadowitz fault extends an abruptly-elevated ridge of Permian and cretaceous grit, the former of which is in reality the margin of an ancient fjord of the cretaceous sea running up (from the direction of Hronar) far into the Permian strata. Similar cretaceous fjords are found in the primitive strata near Czasiaw, in the centre of Bohemia, and at Kieslingswalde, in Silesia. At the northern foot of the Faltengebirge, near Radoventz, there is also a deposit of coal supposed for a long time to be carboniferous, but now acknowledged to be Permian.—M. O. Feistmantel reported on the fossil plants of Schwadowitz collected by himself and M. Krejci, in 1869. This deposit yields in point of richness to that of Radnitz: nevertheless, M. Feistmantel has discovered among nearly 2,000 specimens forty-eight species, only one of which (from this mine) was known to M. Ettingshausen. These remains are arranged in three zones. The lowest, that of the pure schist, contains Pterideæ (*Lonchopteris, Aleythopteris, Neuropteris, Sphenopteris, Adiantites, Cyatherites*), and Equisetaceæ (*Calamites, Asterophyllites, Annularia, Sphenophyllum*). The second zone, that of the black schist, contains Lycopodiaceæ (*Lepidodendron, Lepidostrobus, Lycopodites, Sagenaria*), Nöggerathiœ (*Cordaites, Noggerathia*), and Sigillariæ (*Sigillaria, Stigmaria*). The third, that of coal, contains only Sigillaria and Stigmaria. At Radganice, where fossil trunks of Araucaria in the red grit were the only remains of plants heretofore observed, M. Feistmantel obtained from the Permian coal eleven species of the genera *Annularia, Asterophyllites, Sphenophyllum, Alettsopteris, Cyatherites, Calamites,* and *Stigmaria.* A fine specimen from this locality shows that *Huttonia spicata* is the fruit of *Calamites Suckowi,* and the constant presence of Stigmaria without Sigillaria is a strong argument against the received doctrine that Stigmaria is the root of Sigillaria.

November 24.—Prof. J. Blazek demonstrated, by an elegant method, and without making use of the higher calculus, a series of theorems relating to *polyhedra maxima* inscribed in an ellipsoid of three axes. The latter being considered as a sphere distorted according to certain laws, the author demonstrates that the *corpora maxima* inscribed in the sphere are distorted according to the same laws, and that this likewise holds good for the *corpora maxima* of the derivative ellipsoid.—M. T. Palacky explained his views of the botanical geography of Asia. M. Grisebach has recently divided Asia into four botanical provinces—Western, or that of the steppes; Eastern, or Chinese; Boreal, or Siberian; and Southern, or that of India. M. Palacky only admits two provinces, the one Southern, the other Boreal, including in the latter the whole of Asia beyond the Himalayas, because the first three provinces of M. Grisebach do not appear to him to differ more from one another in regard to their flora than the sub-provinces of each do. The author lays special stress upon the tropical species inhabiting China—where they are not arrested by steppes—as far as Pekin, and even as far as the Amoor. According to him the existing flora of Central Asia is an invasion of the Mediterranean flora, which took place after the elevation of the Turcoman plateau in the place of the ancient post-tertiary sea between Europe and Asia. The principal obstacle in the way of researches connected with botanical geography is the diversity of the views adopted by various botanists; one species of Hooker, Wallich, &c., being at least equivalent to twenty-five species of Maximowicz, Ruprecht, and most of the German botanists.

DIARY

THURSDAY, DECEMBER 30.

ROYAL INSTITUTION, at 3.—On Light (Lectures adapted to a Juvenile Auditory): Prof. Tyndall, F.R.S.

SATURDAY, JANUARY 1.

ROYAL INSTITUTION, at 3.—On Light (Juvenile Lectures): Prof. Tyndall, F.R.S.

MONDAY, JANUARY 3.

ENTOMOLOGICAL SOCIETY, at 7.
MEDICAL SOCIETY, at 8.

TUESDAY, JANUARY 4.

PATHOLOGICAL SOCIETY, at 8.—Anniversary meeting.
ANTHROPOLOGICAL SOCIETY, at 8.—On the Psychical Elements of Religion: Mr. Owen Pike—On the Inhabitants of the Chatham Islands: Dr. Barnard Davis and Mr. A. Welsh.
SYRO-EGYPTIAN SOCIETY, at 7·30.—On the Suez Canal: Mr. W. H. Black, F.S.A.
ROYAL INSTITUTION, at 3.—On Light (Juvenile Lectures): Prof. Tyndall, F.R.S.

WEDNESDAY, JANUARY 5.

PHARMACEUTICAL SOCIETY, at 8.
OBSTETRICAL SOCIETY, at 8.—Anniversary meeting.
ROYAL SOCIETY OF LITERATURE, at 8.30.

CONTENTS