and of a number of Demonstrators and Assistants. Plans for new buildings for Comparative Anatomy, Botany, and Mechanism are to be obtained.

Dr. Besant will lecture on Analysis (Schedules II. and III.) during two terms; Mr. Pendlebury on Analytical Optics, next term, and on Laplace's and Bessel's Functions in the Easter Term; Mr. Webb on Elementary Rigid Dynamics in the Easter Term, and on Higher Dynamics in the Long Vacation.

Inasmuch as the University Table at the Naples Zoological Sation has been constantly occupied by students of animal morphology, and there are students in physiology and botany for whom study at Naples is very desirable, it is proposed to extend the advantages of study to students of biology generally. Dr. Dohrn has unofficially expressed his willingness to receive, when desired, two members of the University at a time for a payment of 100*l.* instead of 75*l.* a year.

It is hoped that the new Biological and Physical Laboratory, connected with Newnham College, which is being fitted up in Downing Place, may be ready for use by the beginning of next term. The nearness of the site to the new museums will enable students of Newnham to attend professors' lectures there and carry out practical study at the laboratory with the least possible loss of time.

With regard to the statement made last week that "St. John's does not as yet open any of its advanced lectures to other than its own students," we are informed that the advanced lectures have for a long time been open to members of the University, and lectures are provided in some subjects not lectured on elsewhere. The sentence in the report was to the effect that the list for next year was not yet issued. It has now appeared, and no less than six courses of open lectures are announced for the remainder of the academical year.

NEW ZEALAND.—The Queen has been pleased to direct Supplementary Letters Patent to be passed under the Great Seal granting and declaring that the Degrees of Bachelor and Doctor in Science granted or conferred by the University of New Zealand shall be recognised as Academic distinctions and rewards of merit, and be entitled to rank, precedence, and consideration in the United Kingdom and in the Colonies and Possessions of the Crown throughout the world, as freely as if the said Degrees had been conferred by any University of the United Kingdom.

SCIENTIFIC SERIALS

THE *American Naturalist* for November, 1883, contains:—The Pre-cambrian rocks of the Alps, by T. Sterry Hunt.—The achenial hairs of Townsendia, by G. Macloskie.—The hibernacula of herbs, by Aug. J. Foerste.—The hair-sac mite of the pig, by Prof. R. Ramsay Wright.—The geology of Central Australia, by Edward B. Sanger.—The number of segments in the head of winged insects, by A. S. Packard, jun.

Gegenbaur's Morphologisches Jahrbuch, Bd. ix., Heft 1, contains:—Researches on marine Rhipidoglossa, by Dr. Béla Haller, No. 1 (plates 1 to 7).—On developmental relationships between the spinal marrow and the spinal canal, by Dr. W. Pfitzner.—Contribution to the comparative anatomy of the posterior limbs in fishes, part 3, Ceratodus, by Dr. M. Davidoff (plates 8, 9).—On some anatomical marks of distinction between the house dog and the wolf, by Prof. H. Landois.

Rivista Scientifico-Industriale, October 23, 1883.—On the influence of static electricity on the needle, by Prof. Michele Cagnassi.—Experiments with the radiometer (continued), by Prof. Constantino Rovelli.—On the conditions which determine the least and greatest deviation of a ray passing through a prism, by Prof. G. Buzzolini.—On the employment of copperas in testing iodides blended with alcoholic bromides and chlorides, by Dr. Alfredo Cavazzi.—On the advantages that may be derived by medical jurisprudence from entomological studies, especially in determining the approximate date and cause of death, by P. Megnin.—Note on the *Titanophasma fayoli*, a new fossil insect found in the carboniferous formations of Commentry, Allier, by the Editor.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, November 15.—"On *Sceparnodon ramsayi*," a fossil mammal from Australian Pleistocene deposits, by Prof. Owen. The first indication of this species was transmitted to the author, in 1881, in the form of casts of detached teeth, all representing an anterior incisor, the most entire specimen being 5½ inches in length, 35 mm. in breadth, with uniform thickness of 8 mm., the tooth, slightly curved, with persistent pulp-cavity at the base, and a sharp chisel-shaped cutting margin at the opposite end. The author deferred notice of this indication in hope of receiving a specimen of the tooth itself. This was needed in order to make the requisite microscopical researches as to structure, the wombat and some small rodents alone possessing, in Australia, ever-growing scalpriform incisors, but markedly differing in shape as well as size from the fossil. Prof. Owen was favoured by receiving, in the present year, from the bed of King's Creek, Queensland, a tooth, identical in character with the cast, and the present paper records the results of his scrutiny of structure. They led to the conclusion of the former existence in Australia of a mammal with rodent upper incisors, as in the wombat, but of distinct shape, and indicative of a species as large as a tapir. The microscopic characters of both dentine and enamel weighed in favour of the marsupial affinities of *Sceparnodon*. The author referred to the fact that the first indication of the genus *Thylacoleo* was a single carnassial tooth submitted to him in 1833 by Sir Thomas Mitchell, and a similar evidence of *Diprotodon* was an incisor brought by the same explorer from the caves he had discovered in the district named, after the Colonel's old commander, "Wellington Valley."

At the same meeting Prof. Owen gave a minute description of a fossil humerus which had been transmitted to him by Mr. Ramsay, F.L.S., who had discovered it in the breccia cave in "Wellington Valley." The bone was partially mutilated, but gave sufficient evidence of its having come from a Monotreme, with so close a conformity, save in size, with that of the existing *Echidna hyotrix*, as to lead to its reference to an extinct species of that genus. It, however, far surpassed it in size, exceeding, as it did, the corresponding bone in the larger Monotrematous ant-eaters which have been found living in New Guinea. Drawings of the subjects of both papers accompanied the text.

Geological Society, November 21.—J. W. Hulke, F.R.S., president, in the chair.—The following communications were read:—On the skull and dentition of a Triassic mammal (*Trity-lodon longævus*, Ow.) from South Africa, by Prof. Owen, C.B., F.R.S. The specimen described in this paper formed part of a collection containing remains of some of the known South-African Triassic reptilian genera, and agreed with them in its mode of fossilisation. It was submitted to the author by Dr. Exton, of Bloemfontein. The specimen is a nearly entire skull, wanting only the hinder part, and it measures about 3¾ inches in length, from the broken end of the parietal crest to the point of the united premaxillaries. The upper surface shows the anchylosed calvarial portions of the parietals, and the frontal bones divided by a suture; the contiguous angles of these four bones are cut off, so as to leave an aperture, occupied by matrix, which may be a fontanelle, or a pineal or parietal foramen. The frontals form the upper borders of the orbits, which are bounded in front by the lacrymal and malar bones, and were not completed behind by bone. Each frontal is narrowed to a point at the suture between the nasal and maxillary. The nasals are narrow, but widen in front to form the upper border of the exterior nostril, which is terminal, and is completed by the premaxillaries. The maxillaries are widened posteriorly, then constricted, and again widened before their junction with the intermaxillaries. The teeth include a pair of large round incisors, broken off close to the sockets and showing a large pulp-cavity, surrounded by a complete ring of dentine, which is covered by a thin coat of enamel on the front and sides. At 2 mm. behind each of these teeth is the socket of a smaller premaxillary tooth; this tooth apparently had a thin wall and a pulp-cavity relatively larger than in the anterior tooth. It is separated by a ridged diastema from the series of six molar teeth on each side, the first of which has a sub-triangular crown with the base applied to the second tooth. The latter and the four following teeth are nearly similar, subquadrate in form, with the crowns "impressed by a pair of antero-posterior grooves, dividing the grinding surface into three similarly disposed ridges, and each ridge is subdivided by cross notches into tubercles. Of these there are, in the second to the fourth molar inclusive, four tubercles on the mid-ridge, three on the inner ridge, and two on the outer ridge." The author discussed the relations of this new form of mammal, especially as indicated by the structure of the teeth, which he showed to resemble those of *Microlestes*, from

the Keuper of Würtemberg and the Rhætic of Somersetshire, and those of the Oolitic genus *Stereognathus*, the former having on each tooth two multituberculate ridges, and the latter three ridges, but with only two tubercles on each. The fossil presents no characters to show definitely whether the animal it represents was a placental or a non-placental mammal.—Cranial and vertebral characters of the crocodilian genus *Plesiosuchus*, Owen, by Prof. R. Owen, C.B., F.R.S. In this paper the author, with the view of showing that the Kimmeridgian *Steneosaurus manselii*, Hulke, really forms the type of a distinct genus, discussed the characters by which Cuvier divided the fossils referred by him to the Crocodiles into three principal groups, to which Geoffroy St.-Hilaire gave generic names, and those by which the latter author afterwards distinguished his genus *Steneosaurus*, including Oolitic forms, from the Liassic genus *Teleosaurus*. From his exposition of these characters the author concluded that the above-named species does not belong to *Steneosaurus*, Geoff., and he proposed to make it the type of a new genus, *Plesiosuchus*, characterised by the convergence of the frontal bones to a point nearer the apex of the skull than in *Steneosaurus*, by the extension of the gradually attenuated nasal bones into a point penetrating the hind border of the nostril, and by other peculiarities of the skull, teeth, and vertebræ. The author pointed out that this form, like *Steneosaurus*, helped to bridge over the space between the Liassic Teleosaurs and the Tertiary and recent Crocodiles, even approaching nearer to the latter than the older Oolitic type.—On some tracks of terrestrial and fresh-water animals, by Prof. T. McKenny Hughes, M.A., F.G.S. The author's observations have been made on certain pits in the district about Cambridge which are filled with the fine mud produced in washing out the phosphatic nodules from the "Cambridge greensand"—a seam at the base of the chalk marl. As the water gradually dries up, a surface of extremely fine calcareous mud is exposed. This deposit is often very finely laminated, and occasionally among the laminæ old surfaces can be discovered, which, after having been exposed for some time to the air, had been covered up by a fresh inflow of watery mud into the pit. The author described the character of the cracks made in the process of drying, and the results produced when these were filled up. He also described the tracks made by various insects, indicating how these were modified by the degree of softness of the mud, and pointed out the differences in the tracks produced by insects with legs and elytra, and by Annelids, such as earthworms. The marks made by various worms and larvæ which burrow in the mud were also described. Marks resembling those called *Nereites* and *Myrianites* are produced by a variety of animals. The groups of ice-spicules which are formed during a frosty night also leave their impress on the mud. The author concluded by expressing the opinion that *Cruziana*, *Nereites*, *Crossopodia*, and *Palæochorda* were mere tracks, not marine vegetation, as has been suggested in the case of the first, or, in the second, the impression of the actual body of ciliated worms.

Anthropological Institute, November 27.—Prof. Flower, F.R.S., president, in the chair.—Dr. J. G. Garson read a paper on the cranial characters of the natives of Timor-Laut. The osteological remains described in this paper were obtained by Mr. H. O. Forbes from the district of Larat, and consist of a series of eleven skulls and crania. The four male skulls are all of a round form, and resemble one another in general appearance; of the females, five correspond in form to the male skulls in being short and broad, but the sixth differs markedly from the others in being narrow in proportion to its length.—Mr. H. O. Forbes read a paper on the ethnology of Eastern Timor, referring especially to the great intermixture of race that has taken place, and to the occurrence of a red-haired, blue-eyed race in the interior; to the numerous dialects, many of them unintelligible at a short distance from the district in which they are spoken; to the religious rites of the people of certain regions, conducted by a priest in what is called the Uma Lulik (or Taboo House) with an intricate and imposing ceremonial; to their marriage ceremonies and customs, which in some districts remind one of the Australian totem system in the occurrence of husband clans and wife clans; to their death and burial rites; to their system of law and justice, under which, though the chief was king and judge, each freeman had the right—or took it—of private war, retaliating on the wrong-doer with his own hands for loss in his property or person. "Eye for an eye" ran their code, like our own Old English one, "and life for life, or for each fair damages." Mr. Forbes had directed special inquiries into the alleged habit of the Timorese in intentionally artificially distorting their infants' heads. No such custom was found to prevail in the districts traversed by him.

The Victoria Institute, December 3.—A paper on recent Egyptological research in its Biblical relations was read. In it the author, the Rev. H. G. Tomkins, described the results up to the present of those researches which are now being made in Egypt, alluding in warm terms to the assistance rendered him in the preparation of his summary of these results by M. Naville and Prof. Maspero.

The Institution of Civil Engineers, November 27.—Mr. Brunlees, president, in the chair.—The paper read was on the new Eddystone lighthouse, by Mr. William Tregarthen Douglass, Assoc. M. Inst. C. E.

CAMBRIDGE

Philosophical Society, Nov. 26.—The following communications were made to the Society:—On the measurement of electric currents, by Lord Rayleigh. The author referred to the method of measuring currents by the silver voltameter as suitable for currents from '05 ampere to 4 amperes, and stated that the electrochemical equivalent of silver as determined at the Cavendish Laboratory was $1{\cdot}119 \times 10^{-2}$. A second method was described, suited for larger currents; it consists in balancing the difference of potential between two points in the circuit through which the current is running against the effects of a standard cell working through a large resistance such as 10,000 ohms. The author suggested as a third method the use of the rotation of the plane of polarisation of light passing through a piece of heavy glass, round which the current circulates in a coil of thick wire. A current of 40 amperes will produce a rotation of 15° if the coil have one hundred turns.—On the measurement of temperature by water-vapour pressure, by Mr. W. N. Shaw.—On some measurements of the well-known dark rings of quartz, by Mr. J. C. McConnel.—On the origin of segmentation in animals, by Mr. A. Sedgwick.

EDINBURGH

Royal Society, December 3.—The Right Hon. Lord Moncreiff, president, in the chair.—This being the opening meeting of the 101st session, it had been the intention of the President to give a Review of the Hundred Year's History of the Society; but, on account of his indisposition, the meeting permitted its postponement. Mr. Robert Gray, one of the vice-presidents, occupied the chair during the remainder of the evening.—Prof. Turner communicated a paper by Prof. Haycraft on the limitations in time of conscious sensation. The paper contained the result of experiments on the limitations in time of tactile and thermal sensations, and dealt also with the limitations in the case of the different senses.—Prof. Tait read a paper by Mr. W. F. Petrie on the old English mile. The old mile was longer than the present, and consisted of 5000 feet of 13 inches. It seemed to be identical with the old French mile. The furlong had no connection originally with the mile, which was modified to suit the former.—Mr. Patrick Geddes read a communication on the re-formation of the cell theory. In a second paper, in order to explain muscular contraction, he advanced an hypothesis based on the existence of surface tension in fluids.

DUBLIN

Royal Society, November 19.—Section of Physical and Experimental Science: G. Johnstone Stoney, F.R.S., vice-president, in the chair.—Prof. W. F. Barrett read a paper on hearing-trumpets and an attempt to determine their relative efficiency by physical means. With the view of obtaining a steady and comparable source of sound of a pitch and quality resembling the human voice, a reed pipe was inclosed in a padded box with an opening on one side, and blown by a steady current of air from a holder, a manometer showing the pressure, which was kept constant. The distance at which sound from this source ceased to be audible was noted, and in cases of slight deafness a sliding shutter was added. In other arrangements devised by the author, the principle of interference of sonorous waves was utilised, the degree of deafness being estimated by the departure from complete interference. An induction balance, in which the interrupter was a C tuning-fork, was also tried; as also a siren driven by a falling weight and blown by a current of air at constant pressure; but none of these arrangements were so simple and uniform as the reed. An attempt was made to test the value of ear-trumpets by means of a sensitive flame. The flame was, however, less sensitive than the ear to sounds of the pitch of the human voice. The author

contended that the main object of a hearing-trumpet should be clearness, not loudness, and for this purpose the portable whispering tube was undoubtedly the best for conversation. For other purposes the principles laid down by Lord Rayleigh should be more generally adopted, the telescopic jointed instrument of gradual slope being the nearest approach to theory.—Prof. G. F. Fitzgerald, F.R.S., read a paper on the quantity of energy communicated to the ether by a variable current. The author shows that an alternating electric current, if it produces radiations of the nature of light, as it would do upon the most probable interpretations of Maxwell's electromagnetic theory of light, would radiate energy equal to $m^2 \times N^4 \times 10^{-29}$ ergs per second, where m is the magnetic moment of the current and N is the number of its alternations per second.—W. E. Wilson exhibited a simple form of reflecting spectroscope with a diffraction grating, which was described by Howard Grubb, F.R.S. By employing a pair of mirrors, by which the light is twice reflected, the necessity for having an instrument of inconvenient length is avoided.—R. J. Moss, F.C.S., exhibited a remarkable specimen of crystallised stibnite from Japan. The crystallographic characters of similar specimens have recently been described by E. S. Dana. Mr. Moss found that this stibnite may be regarded as practically pure antimony tersulphide; a very minute trace of iron is the only impurity present in appreciable quantity.

Section of Natural Science: Prof. V. Ball, F.R.S., in the chair.—H. St. John Brooks, M.B., read a paper on the osteology and arthrology of the haddock (*Gadus æglefinus*). The chief feature of this paper was a description of the articulations of all the bones and the attachments of the various ligaments. The author drew attention to the beautiful arrangement of the articulations of the upper jaw of fishes which is seen to great advantage in this form. Ligaments passing from the palate bones to the premaxillæ of the opposite side are crossed by others passing from the ethmoid to the maxillæ, the whole forming a lattice like arrangement. By these ligaments the component parts of the upper jaw are kept in contact with a nodule of cartilage, which lies between them and the ethmoid.—Prof. V. Ball, F.R.S., exhibited and drew attention to a conglomerate of quartz pebbles which is found at the base of the chalk in certain parts of the county of Antrim, and which appeared to him to be inconsistent with a deep-sea origin. He also exhibited bones of red deer, ox, pig, fragments of pottery and flint flakes, &c., from a kitchen midden at White Park, Bray, Co. Antrim. Among specimens recently contributed to the Geological Museum, samples of spherical phosphorite from Southern Russia were exhibited. One of them, which had been sliced, shows a beautifully radiated internal structure; this, it is hoped, will be figured and published with details shortly.—Dr. W. Frazer read a note on bones and shells obtained from drainage cuttings at Sandymount.—G. Johnstone Stoney, F.R.S., exhibited cores of limestone found in the drift overlying Cambrian slates near Greystones, Co. Wicklow. Water percolates through the drift, and, on reaching the Cambrian slates, makes its way horizontally through the lowest layer of the drift, corroding the limestone boulders, which form one of its constituents; cores of solid limestone are frequently found of some fantastic form in the heart of a friable mass which remains in the part of a boulder that has been acted on by water charged with carbonic acid. This shows that the corrosion is still actively progressing, and that the drift is here undergoing a change which is rapid from a geological point of view. The water also washes away the fine particles of clay, and the result of the change is to alter a clay drift containing a great number of limestones with some stones of other kinds into a gravel containing chiefly these other stones.—A. G. More, F.Z.S., exhibited as a specimen recently acquired by the Natural History Museum the mountain Goat (*Mazama americana*) from the Rocky Mountains. This animal is remarkable for the abundance of its soft white hair; it has the general appearance of the goat, and its horns somewhat resemble those of the chamois.

PARIS

Academy of Sciences, December 3.—M. Blanchard, president, in the chair.—Note on the universal hour proposed by the Conference in Rome, by M. Faye. The author urges several objections against the adoption of Greenwich astronomical time and meridian, calculating the longitudes from 0 to 24h. east, which might be convenient for navigation and astronomical purposes, but unsuitable for railways, telegraphs, government offices, and the public generally. For the formula, universal time = local time − (L + 12h.), where L indicates the longitude calculated east from Greenwich, he proposes to substitute, universal time = local time − L. The formula would thus be simplified by the suppression of the last term, and, instead of Greenwich astronomical time, the civil hour would be adopted as the universal hour. Thus would be avoided the inconvenience of disagreement between local and univeral time, which would otherwise be felt precisely in the most densely peopled regions of the globe.—Remarks on M. Piarron de Mondésir's so-called mechanical problem of the two chains, by M. H. Resal.—On preventive inoculation with artificially developed charbon germs attenuated by the method of rapid heating, by M. A. Chauveau. Of a large number of sheep inoculated with germs heated to + 80° C., not one succumbed, although further tests showed that the germs themselves had lost none of their prolific vitality.—Summary reports on the results of the French mission to Cape Horn: astronomial observations by M. H. Courcelle-Seneuil; terrestrial magnetism, magnetic registers, and photographic work, by Lieut. E. Payen; magnetic observations made at Orange Bay by M. Le Cannellier; *résumé* of the meteorological observations made at Orange Bay between September 26, 1882, and September 1, 1883, by Lieut. J. Lephay.—On the absorption line produced by diluted blood in the violet and ultra-violet region of the spectrum; photographic reproduction of this line in solar light, by M. J. L. Soret.—On the secular variation in the direction of terrestrial magnetic force at Paris (continued), by M. L. Descroix.—Description of an "aëroplane" constructed for the purpose of furthering aërial navigation, by M. de Sanderval.—Supplement to a previous note on M. Tisserand's formula connected with the celestial mechanism, by M. Radau.—Determination of the mutual distances of the three masse, in the mechanical problem of the three bodies, by M. A. Lindstedt.—Theory of the ricocheting action of spherical projectiles on the surface of the water, by M. E. de Jonquières.—On the theory of Abelian integrals, by M. E. Goursat.—On a theorem of Riemann connected with the functions of independent n variables admitting $2n$ systems of periods, by MM. H. Poincaré and E. Picard.—On the geometrical curve of the fourth degree with two double points, by M. Humbert.—On the integration of a homogeneous rational function, by M. C. Stéphanos.—Measurement of the difference of potential of electric layers on the surface of two liquids in contact, one illustration (continued), by MM. E. Bichat and R. Blondlot.—On M. De ains' optical experiment: determination of the optical constants of a birefractive crystal of one axis, by M. Lucien Lévy.—Researches on the stability of solidified superfused sulphur, by M. D. Gernez.—On the artificial production of spessartine (manganesiferous garnet), by M. Alex. Gorgeu.—Experimental researches on the development and accumulation of saccharine (the phenomenon of "saccharogénie") in beetroot, by M. Aimé Girard.—On the acetate of biprimary bichloretted ethyl $\left(\begin{matrix}ClCH^2-CH^2\\ClCH^2-CO\end{matrix}\right)O$, obtained by the reaction of the monochloretted chloride of acetyl on monochlorhydric glycol, by M. Louis Henry.—On the conditions suitable for accelerating the oxidation of siccative oils, by M. Ach. Livache.—On copper as a preservative against infectious diseases, and on the absolutely harmless character of the powders of this metal employed by workers in copper, by M. V. Burq. From his further researches the author maintains, against recent statements to the contrary, that copper undoubtedly possesses certain prophylactic properties against several infectious maladies, and especially against cholera.—Construction of the scapulo-clavicular cincture in the series of Vertebrates, by M. A. Lavocat.—On the sexual and larval polymorphism of the plumicole Sarcopidæ, by MM. E. L. Trouessart and P. Mégnin.—Researches on the physiological properties of maltose (continued), by M. Em. Bourquelot.—On the Adapisorex, a new genus of mammals occurring amongst the Lower Eocene formations of the neighbourhood of Reims, by M. V. Lemoine.—On the discovery of the genus Equisetum in the Kimmeridge clays of Bellême, department of Orne, by M. L. Crié.—On the quaternary lignites of Bois-l'Abbé, near Épinal, by M. P. Fliche.—On the remarkable sunsets observed at Paris and elsewhere in France on November 26 and 27, by M. L. Renou. The author considers that this phenomenon may be connected with a condition of the atmosphere which recurs on the same day every year. Electric disturbances have been regularly observed between November 26 and 28 ever since the shower of meteors, which occurred on November 27, 1872.

BERLIN

Physical Society, November 16.—The experiments with a view to determining the neutral point in the spectrum in the case of the colour-blind, which Dr. König communicated to the Society in March last, have since been further prosecuted by him. With the help of the apparatus, formerly described, consisting of a prism, a movable collimator, and a telescope directed towards the prism's edge, Dr. König had now succeeded in determining in thirteen different cases of colour-blindness the place of the spectrum at which these colour-blind persons felt the impression of white—of the place, namely, which appeared to them exactly of the same hue as would a surface covered with magnesia and shone upon by the light of white clouds. Each measurement was carried out eight times, and then the average taken, by which it appeared that the error in the single measurement was confined probably between ± 0·09 and ± 0·5 millionths of a millimetre. Measurements carried out with an individual for the second time after an interval of fourteen days, showed likewise the same exactness. In the case of the thirteen colour-blind persons who were examined, among them being both red- and green-blind, the neutral point lay between 91·7 and 504·7 millionths of a millimetre, wave-length. If the persons so examined were ranged in accordance with the wave-lengths of their neutral point, it was found that within the limits above specified they formed a fairly continuous series in which red- and green-blind persons took their places indiscriminately, a result in perfect agreement with former conclusions. In his first investigations into the subject, Dr. König had further found that the intensity of light exercised an influence on the situation of the neutral point, and had now further prosecuted this question by experiments on three individuals. For the graduation of the intensity of light he made use of two Nicol prisms in front of the collimator tube, and found, in the case of all three individuals, that with increasing intensity of light the neutral point approached closer to the violet end of the spectrum. Let the wave-length be taken as abscissa, and the intensity of light as ordinate, then would the curve of the neutral points form no straight line, and would, under great increase of intensity, mount upwards almost perpendicularly.—Prof. Schwalbe had in the summer of this year, as in former years, visited several glacial cavities, a branch of inquiry in which he particularly interests himself. In these investigations he took special note of the cold winds issuing from fissures and clefts of the places in question. At Questenberg, for example, in the Southern Harz, he found a place where from a fissure in a steep gypsum wall of about 100 feet high, and having a southern situation, a wind issued with a temperature of 3° C., while the temperature of the air immediately surrounding it was 20° C. warmer. The temperature in the stone fissures was found by him to be still lower, the thermometer often showing zero there, while in the cavities themselves the temperature he had generally observed (in July) was 5° C. Prof. Schwalbe brought out the fact of the great diffusion of such glacial cavities. Besides two in the Harz, he had this summer counted as many as twenty to twenty-five glacial cavities, mostly quite unknown hitherto, in the Karst Mountains on the southern frontiers of Carniola. With regard to the explanation of this phenomenon he still held by the view formerly set forth by him, that the cold was caused by the water which had been cooled to 4° C. filtering through the porous stone, and he deemed a resumption of Herr Jungk's experiments on the cooling of the trickling water necessary to a definite decision on the cause of glacial cavities.

Physiological Society, November 23.—In the cortex of the vertical lobe of the brain, Prof. Munk had, as is known, demonstrated that the separate groups of voluntary muscles had each of them a definite central area whence their movements could be induced. One part of this cortical area was recognised as the central seat of the muscles of the nape and neck, and after these two groups had been topically distinguished, Prof. Munk conjectured that the voluntary muscles of the larynx and jaws would be found to have their centre in the section of the membrane appropriate to the jugular muscles. Dr. H. Krause had put this conjecture to experimental proof, and found it confirmed. On bending back a dog's epiglottis and drawing forward its tongue, the larynx could very readily be observed by daylight, and when the jugular part of the cerebral membrane was irritated by moderate electrical currents, he invariably noticed the rise of the larynx, the movement of the chordæ vocales to a place situated in the middle between expiration and phonation, the rise of the palate, the contraction of the constrictor pharyngis, and movements of the hindermost parts of the tongue. That the part of the membrane in question was the centre of the laryngeal movements was further confirmed by experiments of extirpation which were performed successfully on both sides with ten dogs. The part of the membrane was experimented on in this way first on one side and then on the other, and after all inflammatory symptoms had disappeared, and the cerebral wounds were cicatrised or in process of cicatrisation, it was found that eight dogs had entirely lost the capability of barking, and, on attempting to bark, uttered either no sound or only a hoarse whine, such as new-born puppies emitted. In the case of the two dogs which after the operation continued capable of barking, it appeared that the excision had been made too far on the outside, or not deep enough. Some dogs which after the operation were no longer capable of barking were, after several days, killed, when Dr. Krause searched for the nerve passages, which, in consequence of the removal of the cortical part, were degenerated. In the *ganglion mamillare* he found a part of the nerve fibres in a collapsed, discoloured, and degenerated state, and concluded that the fibres extending from the membranous centre of the larynx to its motory nerves passed through this ganglion. At the invitation of the President, Prof. Munk gave a brief plan of the topography of the membrane of the cerebrum, on which were projected the different sensible and motory nerves of the separate parts of the body. On a drawing of the cerebral surface he showed the particular sites which were the centres of seeing, hearing, feeling, and motion for the muscles of the eyes and the ear, for the face, tongue, nape, neck with larynx and throat, and for the thorax. A particular locality was also pointed out for the muscles of expiration and for those of inspiration. The centres for the extremities had not yet been experimentally demonstrated, but no doubt they were situated on the inside in the large fissure of the cerebrum, where, on account of the unavoidable profuse bleeding which occurred, operations were impracticable.

CONTENTS

	PAGE
Professor Stokes' Works. By Prof. P. G. Tait	145
Royal Engineer Professional Papers. By Allan Cunningham	146
Our Book Shelf:—	
M'Cann's "Report on the Dyes and Tans of Bengal"	147
Wiedersheim's "Lehrbuch der Vergleichenden Anatomie der Wirbelthiere"	147
Letters to the Editor:—	
Evolution of the Cetacea.—Searles V. Wood	147
"Cosmic Dust."—Dr. Henry Rink	148
On the Incubation Period of Scientific Links.—James Blake	148
Meteor.—G. M. Whipple	148
Physical Society, November 10.—D. J. Blaikley	148
The Ophidian Genus "Simotes."—G. A. Boulenger	149
The Remarkable Sunsets. By Prof. C. Piazzi Smyth; Hon. F. A. R. Russell; Prof. John W. Judd, F.R.S.; Dr. H. J. Johnston-Lavis; Dr. Hyde Clarke; Howard Fox; Sydney Hodges; B. E. Brodhurst; Richard M. Barrington; W. Hamilton; Elizabeth M. Pitman	149
The Java Eruptions and Earthquake Waves	153
Bicentenary of Bacteria. By Ferdinand Cohn	154
The Upper Currents of the Atmosphere	154
Electric Shadows. By Prof. Silvanus P. Thompson (*With Diagrams*)	156
Notes	157
Our Astronomical Column:—	
Encke's Comet	159
Geographical Notes	160
The November Meeting of the National Academy of Sciences	161
Ripple-Marks. By Prof. G. H. Darwin, F.R.S.	162
Note on Deafness in White Cats. By Dr. Lawson Tait	164
University and Educational Intelligence	164
Scientific Serials	165
Societies and Academies	165