nized as new by Maximowicz, are described: *Gentiana Maximowiczi, leucomelæna, purpurata, siphonantha, Regeli, glomerata*, and *G. Kuroo*, var. *brevidens*. They are from Central Asia, North China, and Mongolia.—Report of the International Meteorological and Polar Conferences, and the International Committee of Weights and Measures, by H. Wild. No. 4: Remarks on Mr. Kock's work, "Comicorum Atticorum fragmenta" (in German).

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 5.—"Transmission of Sunlight through the Earth's Atmosphere. Part II. Scattering at Different Altitudes." By Captain W. de W. Abney, C.B., D.C.L., F.R.S.

In this paper the results of observations made by exposing platinotype paper are recorded, and it is shown that the total intensity of light as thus registered is the same as if observations had been made on a ray of λ 4240 alone. The observations were made at altitudes varying from sea-level to 12,000 feet in different countries, at different times of the year, and during four to five years. The instrument in which the exposures were made is described, as also the method of deriving the intensity of light from the developed prints. The results of these observations agree closely with those obtained by the measures of the spectrum which was described in Part I. of this subject. The value of k in the formula (1) $I' = \epsilon^{-k\lambda^{-4}x}$ (from which can be calculated the loss of intensity of a ray of any particular wave-length) was found to be 0·00146 at sea-level. It was also found that k apparently varied as h^2, h being the barometric pressure. A table is attached, showing the value of the transmitted light in the formula (2) $I' = Ia^x$, where a is a constant and x the air thickness in terms of the vertical thickness, μ being the formula $I' = Ie^{-\mu x}$, from which (1) and (2) are both shown to be derived.

Bar in inches.	μ.	a.	Bar in inches.	μ.	a.
30	0·154	0·856	24	0·098	0·908
29	0·144	0·866	23	0·090	0·915
28	0·134	0·875	22	0·083	0·922
27	0·124	0·884	21	0·075	0·928
26	0·115	0·891	20	0·068	0·934
25	0·107	0·899	19	0·062	0·940

Linnean Society, April 21.—Prof. Stewart, President, in the chair.—An example of an Australian bird (*Gymnorhina*), which had lately been shot near Tor Abbey, Devonshire, after being observed all the winter, and which had doubtless escaped from confinement, was exhibited on behalf of Mr. W. Else, Curator of the Torquay Museum.—On behalf of Mr. Charles Head, of Scarborough, two specimens of the Whiskered Bat (*Vespertilio mystacinus*) taken in that neighbourhood were exhibited.—Mr. W. B. Hemsley, F.R.S., read a paper entitled "Observations on a Botanical Collection made by Mr. A. E. Pratt in Western China, with descriptions of some new Chinese plants from various collections." Mr. Pratt travelled in 1889–90 in Western China, close on the borders of Eastern Tibet, and though chiefly in search of zoological specimens, he fortunately secured the services of a native who had been trained to dry plants by Dr. Henry, the result being that he was enabled to bring home a very interesting botanical collection. The plants were obtained chiefly at elevations of 9000 to 13,500 feet, in the neighbourhood of Tat-sien-lu, a frontier town situated in about 30° N. lat. and 102° 15′ E. long.; and although Mr. Hemsley reported that he had not finished working out the collection, he estimated that it contained about 500 species, of which perhaps 150 species were new to science. The paper was criticized by Mr. C. B. Clarke, who remarked that the mountain ranges of Western China seemed to abound in showy herbaceous plants, rivalling in this respect the richest districts of the Himalayan region, of which, in fact, it is a continuation.—Mr. H. M. Bernard then gave an abstract of a paper on the relation of the Acaridæ to the Arachnida, in which he argued that the former were fixed larval forms of the latter; though he found a difficulty in dealing with the segmentation, this being so profoundly modified and in some cases lost. The paper was criticized by Mr. A. D. Michael, Mr. Breeze, and Prof. G. B. Howes, all of whom, while testifying to the ingenuity of Mr. Bernard's reasoning, considered that there was hardly as yet sufficient evidence to justify the acceptance of his conclusions.

May 5.—Prof. Stewart, President, in the chair.—On behalf of Mr. Holt, Prof. G. B. Howes exhibited and made remarks on a very interesting collection of the metamorphosing larvæ of flat-fish.—Mr. Curtis showed a photograph of sections of the Silver and Douglas firs, illustrating the relative rate of growth in trees of the same age growing in the same soil and under similar conditions in all respects, the diameter of the one (*A. Douglasii*) being nearly double that of the other.—Mr. George Murray exhibited spirit specimens of *Asco-thamnion intricatum*, an organism described as a siphoneous Alga, but ascertained to be identical with an animal—namely, *Zoobotryon pellucidum*, Ehrenberg. He also exhibited two specimens of a palm (*Thrinax Morrisii*, Wright), peculiar to Anguilla in the Leeward Islands, and made some remarks as to the results of the recent cryptogamic collections made by Mr. W. R. Elliott for the West India Committee.—Mr. Holmes exhibited and made some observations on an abnormal development of the calyx in a primrose.—The President exhibited and explained a collection of Lepidoptera containing several examples of mimicry between protected forms.—On behalf of Dr. J. Müller, Mr. Thiselton Dyer communicated a paper entitled "Lichenes Epiphylli Spruceani."—Mr. W. F. Kirby gave an abstract of a paper on the family *Saturnidæ*, with descriptions of new species in the British Museum.—In the absence of the author, Mr. W. Percy Sladen read a paper by the Rev. Hilderic Friend, entitled "Observations on British Earthworms."—The President announced that the anniversary meeting of the Society would be held on May 24, at 3 p.m.

Royal Microscopical Society, April 20.—The President, Dr. R. Braithwaite, in the chair.—Mr. A. W. Bennett called attention to some slides received from Prof. D. P. Penhallow, of Montreal, who sent them to illustrate an improved method of labelling. Instead of writing upon the usual paper label, he writes directly upon the glass, and covers the writing afterwards with a thin coating of Canada balsam, which makes it permanent.—Prof. F. Jeffrey Bell said that, the Council having concluded the negotiations with their landlords, the rooms of the Society would now be open for the use of the Fellows every Wednesday evening from 6 to 10 p.m., from November till June. This order would take effect at once.—Mr. F. Chapman's paper onthe Foraminifera of the Gault of Folkestone was read.—Surgeon P. W. Bassett-Smith's paper on the deep-sea deposits ot the Eastern Archipelago was read by Prof. Bell. H.M.S. *Penguin*, to which Surgeon Bassett-Smith was attached, made a passage during the latter part of 1891 from Port Darwin, North-west Australia, through the Arafora, Banda, Celebes, Sulu, and China seas to Hong Kong. A continuous and close line of soundings was taken through the whole passage, the deepest water being 2880 fathoms in the Banda Sea. In almost every instance specimens of the bottom were obtained. They consisted mostly of "green muds," with a few "blue" and "brown muds" in the deeper parts. The definition of "green mud" is a very wide one; broadly it may be divided into that in which calcareous organisms, chiefly Globigerina, predominate, and that in which the tests of Radiolarians have taken their place; this latter condition was almost always present in "brown muds." The inorganic materials were either fine quartz sand in the deeper and more distant positions, or, as the coast was approached, argillaceous matter together with sponge spicules and small shells. In places the material was typically volcanic, as in the upper part of the Banda Sea, among the Moluccas, and on the coast of Luzon. Only two specimens of pure Globigerina ooze were obtained, both being in the Molucca passage, one in 1885 fathoms and the other in 197 fathoms. It would seem that in the deeper parts of the seas the bottoms consist of Radiolarian muds, and the shallower parts of Globigerina muds, the line being roughly drawn at 1500 fathoms. In almost every case over 2000 fathoms the siliceous organisms were undoubtedly most abundant.—A note was read from Dr. E. Giltay on the use of the camera lucida in drawing Bacteria,

in which he recommended the illumination of the drawing by a powerful lamp, and the testing of the drawing by a slight change in the position of the paper, so as to compare side by side the drawing made and the camera lucida outline. Dr. Giltay stated he had succeeded in drawing objects magnified 2500 times. Mr. A. D. Michael thought the method of comparison would be likely to produce distortion.—Prof. Bell said a note had been received from Mr. J. C. Wright on some rotifers which he had found attached to a newt. The accompanying drawings did not render it sufficiently clear that what he had found were really rotifers, and he suggested they were Vorticellæ. —A note from Mr. W. M. Osmond was also read, descriptive of a new cheap photomicrographic stand. Dr. W. H. Dallinger thought that though it might be useful for low-power work, he doubted if it would be of value for high or even moderate powers. He should be afraid that there would be too much vibration. Mr. C. L. Curties said he should be sorry to use it for anything beyond a half-inch objective.

Geological Society, April 27.—Prof. J. W. Judd, F.R.S., Vice-President, in the chair.—The Chairman announced that the Organizing Committee of the International Geological Congress have arranged to convene the sixth meeting of the Congress at Zürich, about the commencement of September 1894. Any communications should for the present be addressed to Prof. E. Renevier, University, Lausanne.—Prof. W. C. Williamson, F.R.S., exhibited the following specimens: slab of Carboniferous Limestone from Bolland, illustrating the passage of a foraminiferal ooze into crystalline calcite; *Asteropecten Orion*, Forbes, from the Kellaways rock, near Pickering, Yorkshire; and made the following remarks:—The specimen before me is a slab of Carboniferous Limestone from the Bolland district of West Yorkshire. In its centre is a magnificent section of a large Nautilus—beautiful as a fossil, but still more important because of what it teaches. Its large terminal chamber is filled with foraminiferal ooze, the component objects of which are almost as perfect as when the organisms were living. The surrounding limestone is chiefly in an amorphous state; but it contains innumerable evidences that it also consists of foraminiferal ooze, largely reduced to the amorphous state by the agency of carbonic acid, now known to be so abundant in the depths of the ocean. The action of this acid upon the minute calcareous shells necessarily converted the water into a solution of carbonate of lime. In this state it percolated by osmosis through the shell of the Nautilus, penetrating its closed chambers, which it gradually filled with calcareous spar. The specimen is thus an epitome, within its limited area, of what has taken place on a gigantic scale in the deep sea. We have here first the organic mass, next its conversion into amorphous limestone, and lastly the production of the crystalline state of the same, so frequently seen filling the interiors of fossils. The second object is the original type-specimen of Forbes's *Asteropecten Orion*, from a sandstone bed of the Kellaways rock in the neighbourhood of Pickering, in Yorkshire. This starfish had lived upon and became buried in a sandy matrix which contained no lime. When the rock was split open, the space originally occupied by the starfish was hollow; the sand contained no soluble material, like that which filled the chambers of the Nautilus. But in the lowest beds of the Coralline Oolite at Filey Brigg, on the Yorkshire coast, we long ago found another species of starfish closely allied to the Pickering species. This was embedded in calcareous stone, which had once in all probability been foraminiferal ooze, and the processes which filled the chambers of the Nautilus also filled the cavity left by the decay of the starfish with crystalline carbonate of lime. These specimens, studied collectively, illustrate two of the most important and common of the processes by which the mineralization of fossil remains has been effected.—The following communications were read:—Notes on the geology of the Northern Etbai or Eastern Desert of Egypt, with an account of the emerald mines, by Ernest A. Floyer. The principal feature in the district is a long ridge of igneous upthrust running north north-west and south-south-east, in which porphyry rises into lofty peaks, whilst the lower parts are formed of granites and sedimentary rocks. To the west of the watershed, sedimentary rocks occur dipping slightly to the west. The following succession of rocks in descending order is given by the author: limestone, sandstone, clay, "cataract"-rock (corresponding to the *Stock-granit* of Walther), and compact hard granite. The sedimentary rocks are frequently metamorphosed, and the author states that every stage of metamorphism is shown, from sandstone to compact green granite. The blue clay shows various kinds of metamorphism, and forms the pistachio-breccia containing topazes, and the mica-schist, mica-slate, and talcose blue clay of the mass of Zabbara containing emeralds. The author discusses certain theoretical questions, and considers that the erosion of the valleys does not indicate the existence of a greater rainfall than the present one. He concludes by giving an account of the emerald mines. The reading of this paper was followed by a discussion, in which Prof. Hull, Prof. Le Neve Foster, Mr. Rudler, Mr. J. W. Gregory, and Dr. Blanford took part.—The rise and fall of Lake Tanganyika, by Alex. Carson (communicated by R. Kidston). In this paper attention is called to certain recorded discrepancies concerning the discharge of Tanganyika by the Lukuja. It is suggested that the rise of the lake is due to the blocking-up of the river by vegetation, assisted by silting during the first rains, whilst the fall is produced by the destruction of the barrier formed in this manner.

Zoological Society, May 3.—Prof. W. H. Flower, F.R.S., President, in the chair.—The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of April, 1892, and called attention to a finely-marked Owl (*Pseudoscops grammicus*) from Jamaica, presented by the Jamaica Institute, being the first example of this Owl that has reached the Society.—Mr. Sclater exhibited and made remarks on a fine specimen of the egg of *Æpyornis*, the extinct giant bird of Madagascar, obtained from Southern Madagascar, and brought to this country by Mr. Pickersgill, H.B.M. Vice-Consul at Antananarivo.—Mr. Oldfield Thomas read a paper on the probable identity of certain specimens formerly in the Lidth de Jeude collection, and now in the British Museum, with those figured by Albert Seba in his "Thesaurus" of 1734.—Mr. F. E. Beddard read some notes on various species of aquatic Oligochætous Worms that he had lately had an opportunity of examining. Amongst these was a new form allied to *Acanthodrilus* from the saline waters of the Pilcomayo, discovered by Mr. Graham Kerr during the Pilcomayo expedition.—Dr. Hans Gadow read a paper on the systematic position of *Notoryctes typhlops*, the newly-discovered Mammal of Central Australia, and came to the conclusion that this anomalous form should stand as a distinct family of Polyprotodont Marsupials, allied to the Dasyuridæ and the Peramelidæ.—A communication was read from Captain H. G. C. Swayne, R.E., containing field-notes on the Antelopes of Northern Somali-land. —Mr. W. Schaus read the second portion of his descriptions of new species of Lepidoptera Heterocera from Brazil, Mexico, and Peru.—Mr. W. L. Sclater read some notes on certain specimens of Frogs in the Indian Museum, Calcutta, and gave descriptions of several new species based upon some of these specimens.

Entomological Society, May 11.— Frederick DuCane Godman, F.R.S., President, in the chair.—The President announced the death, on May 4, of Dr. C. A. Dohrn, of Stettin, one of the ten Honorary Fellows of the Society. Mr. Stainton, F.R.S., expressed regret at the death of Dr. Dohrn, whom he had known for a great number of years, and commented upon his work and personal qualities.—Dr. D. Sharp, F.R.S., exhibited drawings of the eggs of a species of Hemiptera, in illustration of a paper read by him before the Society; and also a specimen of a mosquito from the Amazon district, with the body, legs, and palpi furnished with scales as in Micro-Lepidoptera.—The Rev. Canon Fowler, on behalf of Mrs. Venables, of Lincoln, exhibited cocoons of a species of *Bombyx* from Chota Nagpur, India; also the larvæ-cases of a species of Psychidæ, *Cholia crameri*, from Poona, India; and a curious case, apparently of another species of Psychidæ, from the island of Likoma, Lake Nyassa.—Mr. F. W. Frohawk, on behalf of the Hon. Walter Rothschild, exhibited a specimen of *Pseudacræa miraculosa* mimicking *Danais chrysippus*; also a specimen of the mimic of the latter —*Diadema misippus*—and read notes on the subject.—Mr. C. G. Barrett exhibited, and commented on, a long series of specimens of *Melitæa aurinia* (*artemis*) from Hampshire, Pembrokeshire, Cumberland, and other parts of the United Kingdom; also a long and varied series of *Coremia fluctuata*.—Mr. H. Goss exhibited, for Mr. W. Borrer, Jun., of Hurstpierpoint, a photograph of a portion of a nest of *Vespa vulgaris* which had been built with the object of concealing the entrance thereto and protecting the whole nest from observation. He also read notes on the subject, which had been communicated to him by Mr. Borrer.

—The Hon. Walter Rothschild communicated a paper entitled "Notes on a collection of Lepidoptera made by Mr. William Doherty in Southern Celebes during August and September, 1891." He also sent for examination the types of the new species described therein.—Dr. Sharp read a paper entitled "On the eggs of an Hemipterous Insect of the family *Reduviidæ*. Mr. McLachlan, F.R.S., Mr. Poulton, F.R.S., and Mr. Hampson made some remarks on the subject.

Mathematical Society, May 12.—Prof. Greenhill, F.R.S., President, in the chair.—The following communications were made:—A Newtonian fragment on centripetal forces, by Mr. W. W. Rouse Ball. The demonstrations given by Newton in his "Principia" are geometrical, though there is little doubt that in establishing the truth of some of his results he used fluxions (cf. the "Commercium Epistolium," Rigaud's "Essay on the first publication of the 'Principia,'" and Brewster's "Life of Newton"). To his contemporaries the language and methods of geometry were familiar, while to most of them the calculus was unknown; hence it was natural and reasonable that the proofs should be presented in a geometrical form. It is probable that the fluxional analysis by which a result was obtained was generally thrown aside as soon as a synthetic geometrical proof had been found; apparently the only proposition in the book of which Newton's fluxional demonstration has been published is his determination of the form of the solid of least resistance, of which the result alone was given in Book ii., Scholium to Prop. 35 (first edition). Among the numerous sheets of rough work and calculations which are preserved in the Portsmouth collection is a fragment on the law of centripetal force under which any orbit, and particularly a parabola of any order, can be described. The theorem to which the analysis leads is so inconvenient of application as to be practically useless, and probably for that reason was not inserted in the "Principia." Such interest as it possesses lies rather in its illustrating the way in which Newton arrived at the law given (in the paper) for the description of any parabola under a central force. The date of the fragment is put "about the year 1694," when we know that Newton was engaged in revising the first edition of the "Principia."—On an operator that produces all the covariants and invariants of any system of quantics, by Dr. W. E. Story.—Applications of a theory of permutations in circular procession to the theory of numbers, by Major MacMahon, F.R.S.

OXFORD.

University Junior Scientific Club, March 18.—Mr. J. A. Gardner, Magdalen College, President, in the chair.—A paper was read by Mr. J. E. Marsh, Balliol College, on variations in the rotatory power of turpentine oil. This was chiefly given up to the consideration of the probable explanation of the phenomenon. The experiments were described at length in the Journal of the Chemical Society some months back.—Mr. T. H. Butler, of Corpus Christi College, read a paper on poisons, chiefly in relation to their physiological action.—Mr. H. Balfour, of Trinity College, exhibited a whaling cross-bow from Greenland.—Mr. F. Britten, of Christ Church, exhibited a specimen of incrustation.

March 30.—Mr. J. A. Gardner, President, in the chair.—Mr. E. B. Poulton, F.R.S., read a paper on a further investigation of the degenerate scales of Lepidoptera with transparent wings, which was illustrated by the magic lantern.—Mr. O. V. Darbishire, Balliol College, read a note on karyokinesis, illustrated by microscopical preparations.—A note was read by Mr. R. S. Hughes, Jesus College, on the action of dried hydrogen sulphide on magnesia.

DUBLIN.

Royal Dublin Society, April 20.—Sir Robert Ball, F.R.S., in the chair.—The following communications were made:—On a new mercury-glycerine barometer, by Dr. J. Joly. This barometer has the full range of the glycerine barometer. The total length of the tube is, however, only 250 cms. about. This result is attained by weighting the glycerine in the tube by a column of mercury 67 cms. in length. By means of a float in the mercury which pulls a disk, loosely fitting the tube, against the base of the column, this is kept from breaking, and falling down through the glycerine. In a uniform tube this column remains of invariable length and moves up and down with the glycerine. The balance of the atmospheric pressure is equilibrated by glycerine drawn from a bath of glycerine. Owing to the short length of tubing traversed by the viscous liquid, the instrument is probably more prompt than the full length glycerine barometer. On the other hand, there appears to be a very slow ascent of the glycerine past the mercury, which will probably necessitate the resetting of the instrument at intervals.—Mr. J. R. Wigham read a paper explanatory of the new "giant" lighthouse lens, the largest ever made, which he exhibited to the meeting. It was constructed for him by Messrs. Barbier and Co., of Paris. Its focal distance is 2 metres, and its axial intensity equal to 800,000 candles. The beam which this lens, in triform, in conjunction with Mr. Wigham's new "intensity" burner, is capable of transmitting to the mariner, has more than five times the power of that of Tory Island, the largest lighthouse light in the world, and is much more efficacious in penetrating fog than the most powerful electric light.—Dr. G. Johnstone Stoney, F.R.S., read a paper on the cause of the absence of hydrogen from the earth's atmosphere, and of water and air from the moon. In this communication reference is made to the conditions that determine the height of an atmosphere upon any celestial body. These had been announced by the author in a paper "On the Physical Constitution of the Sun and Stars," printed in the Proceedings of the Royal Society for 1868; and in the present paper it is pointed out that the same method of investigation shows that under certain circumstances some of the constituents of an atmosphere may, molecule by molecule, wander off into space. This event occurs with more readiness—(1) the lower the mass of the molecules of the gas; (2) the feebler the attraction downwards at the boundary of the atmosphere; (3) the higher the temperature at the boundary of the atmosphere. By investigating the conditions that prevail on the earth and moon, it is shown that free hydrogen could not remain a constituent of the earth's atmosphere; and that no free oxygen, nitrogen, or the vapour of water, could remain on the moon. Hence, even if there were no oxygen present, the earth's atmosphere could not retain free hydrogen; and on the moon there is now neither atmosphere, such as we know it, nor water, nor ice. It follows from the investigation that space must be peopled with vast numbers of wandering gaseous molecules, especially of the lighter gases, and that these tend ultimately to settle down upon such of the more massive bodies of the universe as are sufficiently dense to exercise a powerful attraction at their surface. Finally, the investigation indicates conditions which must be fulfilled by any "nebular hypothesis" in order that it may be admissible.—A list of Irish Rotifers, with descriptions of twenty-five new species, by Miss Glascott, was communicated by Prof. A. C. Haddon.

PARIS.

Academy of Sciences, May 9.—M. d'Abbadie in the chair.—Photographs of solar prominences taken by M. Deslandres at Paris Observatory, by M. Mouchez. This is a brief statement of the work that is being done at Paris on the dimensions and velocities of solar prominences. By the methods employed the radial velocity can be determined within about a kilometre per second. Some of the photographs obtained were presented by M. l'Amiral Mouchez to the Academy. It is proposed to make a continuous record of the movements of the solar atmosphere as soon as the necessary funds are obtained.—On the propagation of Hertz oscillations, by M. H. Poincaré.—On residual life and the products of the action of separate tissues of living beings, by MM. A. Gautier and L. Landi. After a healthy animal has been killed, a considerable interval elapses before the death of the tissues. This action after the death of the body as a whole is termed "*la vie residuelle*" by the authors. They have investigated the changes that go on by analyzing flesh freshly killed and otherwise, and comparing the results.—On entire functions of the form $e^{G(x)}$, by M. Hadamard.—A theorem on harmonic functions, by M. G. D. d'Arone.—On the determination of the moment of the torsion couple of a unifilar suspension, by M. C. Limb.—Action of potassium cyanide on ammoniacal copper chloride, by M. E. Fleurent. By heating together in sealed tubes potassium cyanide, cupric chloride, and ammonium chloride, the author has succeeded in forming the compounds, (1) $2Cu_2Cy_2 . AmCy . 2NH_3 . 3H_2O$, forming long blue needles, very unstable; (2) $2CuCy_2 . Cu_2Cy_2 . 2NH_3 . 3H_2O$, green rectangular plates, quite stable in the air.—Sodium trimethylcarbinol:

thermal value of the replacement of H by Na in a tertiary alcohol, by M. de Forcrand.

$C_4H_{10}O$ sol. + Na sol. = H gas + C_4H_9ONa sol. . . . + 27·89 cal.

For secondary and primary alcohols the values are respectively + 29·75 and + 32·00 cal.—Establishment of the fundamental formulæ for the calculation of maximum moments of inertia (of molecules), by M. G. Hinrichs.—The constitution of the hydrocarbon derived from perseïte, by M. L. Maquenne.—The chemical properties and analysis of acetyl fluoride, by M. Maurice Meslans. (See Notes.)—The acid antimonite of pyrocatechol, by M. H. Causse.—Action of organic acids on acetylenic hydrocarbons, by MM. A. Béhal and A. Desgrez.—On the stranding of a whale mentioned in the 113th Olympiad, by M. G. Pouchet.—On the physiological constitution of the tubercles of potatoes in relation to the development of shoots, by M. A. Prunet.—On the old glaciers of the Cordilleras of Chili, by M. A. G. Nogués.—On the genus *Megapleuron*, by M. Léon Vaillant.—On a Dicotyledon found in the Upper Cretaceous on the environs of Sainte-Menehould (Marne), by M. P. Fliche.

AMSTERDAM.

Royal Academy of Sciences. April 29.—Prof. van de Sande Bakhuyzen in the chair.—Mr. Behrens dealt with the microscopic structure of alloys. Crystallization is a common phenomenon in metals. The least crystalline are pure Al, Cu, Ni, when cast without overheating. Rapid cooling has no other effect than to make the crystals of smaller size. Pure Ag does show always crystallization, if properly etched. In alloys crystallization is more easy and perfect than in unalloyed metals. When 1 gr. of Cu, alloyed with 2 mgr. Ag, is melted and slowly cooled, it will be found chequered by minute threads of an alloy rich in silver. All types of structure found in crystalline rocks can be reproduced in alloys. The most common is rectangular wickerwork, less common are isolated clusters of crystals (alloys with few crystals of high melting-point, as in Zn + 10 per cent. Pt, Cu + 10 per cent. Co). Mechanical stress does not destroy the crystalline structure. A fibrous or lamellar structure is set up, corresponding with planes of sliding or shearing in inter-crystalline matter, and under heavy stresses partly due to flattening and stretching of crystals. By annealing, alloys of Cu with Ni can be made to crystallize even as soft iron, thereby becoming even brittle.—Mr. Schoute treated of movement in space of n dimensions.—Mr. Bakhuis Roozeboom treated of the hydrates of iron perchloride.—Mr. Kapteyn made a communication on the distribution of the stars in space. He has compared the spectral type of stars of different proper motion. For this latter element the list given by Mr. Stumpe in the *Astr. Nachr.*, Nos. 2999-3000, was used; the spectral types were taken from Mr. Pickering's "Draper Catalogue." 476 stars not fainter than 7·0m. were found common to the two catalogues. Together with these, 115 other well-determined stars were used, taken from Bradley's catalogue, whose proper motion according to Auwers's reduction is less than 0·003s. in R.A., and less than 0″·03 in Decl. This material, arranged according to the amount of the proper motion, leads to the following conclusion:—The region of the universe nearest to our planetary system contains nearly exclusively stars of the second type (Pickering's Cl. E–L); with growing distances the number of stars of the first type (Pickering's Cl. A–D), relatively to the number of those of the second type, increases gradually and approximately in inverse ratio with the proper motion (*i.e.* very probably in direct ratio with the distance) in such a way that equality of number is reached at a distance corresponding to a proper motion of 0″·08 or thereabout. At distances still greater, the stars of the first type begin to preponderate, and they are more than twice as numerous as those of the second type at the mean distance of those of Bradley's stars, whose proper motion is insensible. From the differences between visual and photographic magnitudes Mr. Kapteyn shows that analogous results will most probably be found for the southern hemisphere as soon as a catalogue of southern star spectra is published. The investigation further indicates, though far less clearly, for the centre of symmetry of the system, a situation at a certain distance from the sun in the direction of 23 hours of R.A. Lastly, it is demonstrated that, even for distances corresponding to proper motion of 0″·16 to 0″·30, no accumulation of stars towards the plane of the Milky Way is shown; that for distances considerably greater this accumulation cannot be considerable, and that the Milky Way must be attributed therefore to stars at enormous distances.—Mr. Franchimont communicated an experiment used by him in his College during several years to show that the presence of hydriodic acid is necessary for the formation of iodine starch.

GOTTINGEN.

Royal Society of Sciences.—The following papers of scientific interest have appeared in the *Nachrichten* since November 11, 1891:—

November 11, 1891.—E. Riecke and W. Voigt, the piezo-electric constants of quartz and tourmaline.

November 25.—Franz Meyer, on a persistence-theorem for algebraic equations. Starting from the theorem that, for a cubic equation, the sum of the number of real roots for the cubic and its Hessian together is always three, the author finds for any equation of odd order a series of forms such that the sum of the real roots of the equation and these forms together is always the same.—Otto Bürger, preliminary communication on the *Nemertina* of the Gulf of Naples.—Otto Wallach, on certain new hydrocarbons with a ring of carbon-atoms.

December 23.—Alfonso Sella, contribution to our knowledge of the specific heats of minerals.—Frobenius, on potential functions whose Hessian is zero.—Schönflies, remark on Hilbert's theory of algebraic forms.—Alberto Tonelli, remark on the solution of quadratic congruences.—P. Drude and W. Nernst, on fluorescence-effects of stationary light-waves.

January 27, 1892.—Heinrich Burkhardt, the reduction of the twenty-seven lines of a cubic surface to the transformation problem of the hyper-elliptic functions for $p = 2$.—David Hilbert, on the theory of algebraic invariants.—Clemens Hartlaub, on the *Anthomedusæ*.

March 9.—J. Disse, changes in the renal epithelium during secretion.—Kroeker, the dependence of the specific heat of boracite upon the temperature.

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