Eocene period of North America (illustrated), by E. D. Cope.—On the Labrador Eskimo and their former range southward, by A. S. Packard.

Rendiconti del Reale Istituto Lombardo, April 23.—Some formulas for the calculation of the momenta of inertia in plain polygons, by Prof. G. Bardelli.—Some remarks on the functions which satisfy the differential equation $\Delta^2 u = 0$, by Prof. Giulio Ascoli.—Note on the morphological distinction between the various homologous and analogous organs of the different orders in the animal kingdom, by E. L. Maggi.—On a generalisation of the involute properties of complete squares and quadrilateral figures, by Gino Loria.—On a method of plain representation for the descriptive geometry of ordinary space, by Prof. F. Aschieri.—On the discontinuities in the secondary derived forms of the potential functions of a surface, by Dr. Paolo Paci.—Meteorological observations made in the Royal Brera Observatory, Milan, during the month of April.

Rivista Scientifico-Industriale, April 15-30.—Remarks on the velocity of the wind in connection with Prof. Archibald's experiments with Biram's anemometers, by the Editor.—Variations in the electric resistance of solid and pure metallic wires, according to the temperature (continued), by Prof. Angelo Emo.—Description of a new steam generator based on the principle of vortex circulation, by Prof. Annibale Riccò.—Note on the *Emberiza intermedia* discovered by Dr. Michaellis in Dalmatia; is it a distinct species in this family of birds? by Dante Roster

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 7.—"Contributions to the Chemistry of Chlorophyll. Part I.," by Edward Schunck, F.R.S.

The paper treats of the products formed by the action of acids on chlorophyll. All who have worked with chlorophyll are familiar with the peculiar effects produced in solutions of chlorophyll by the action of acids. The colour is changed, and an absorption spectrum makes its appearance, which differs from that of chlorophyll. According to some, these changes are due to a simple modification of the chlorophyll, others consider they are caused by the formation of products of decomposition. The latter view seems the more probable.

On passing a current of hydrochloric acid gas into an alcoholic solution of chlorophyll, a dark green, almost black, precipitate is formed at once. The greenish-yellow liquid contains substances extracted along with chlorophyll by the alcohol, and not connected with the latter. The precipitate consists essentially of two colouring matters, phyllocyanin and phylloxanthin, bodies that had been previously observed and so named by Fremy, who, however, did not obtain them in a state of purity. They are best separated by Fremy's method, which consists in dissolving the mixture in ether, and then adding concentrated hydrochloric acid, when the liquid separates into two layers, a lower blue one containing phyllocyanin and an upper yellowish-green one containing phylloxanthin. It is immaterial what kind of leaves are taken for extraction, the products are always the same.

The paper deals only with the properties of phyllocyanin, which are very peculiar. After being purified in the manner described, it is obtained as a dark blue mass resembling indigo, and consisting of microscopic crystals which are generally opaque, but sometimes when very thin are translucent, and then appear olive-coloured. It stands heating to 160° without decomposition, but between that temperature and 180° it is decomposed without previously fusing, leaving a charred mass which, on further heating, burns away without residue. It contains nitrogen, but is free from sulphur.

Phyllocyanin is insoluble in water, petroleum ether, and ligroin, but dissolves in alcohol, ether, chloroform, glacial acetic acid, benzol, aniline, and carbon disulphide. The best solvent is chloroform. A minute quantity of the substance imparts an intense colour to any one of these solvents. It is only on diluting largely that the solutions lose their opacity. They then appear of a dull green or olive colour, and show the well-known and often described spectrum of so-called "acid chlorophyll," consisting of five bands, three of which are very dark, one of moderate intensity, and the fifth very faint.

By oxidising agents, such as nitric or chromic acid, phyllocyanin is easily decomposed, yielding yellow amorphous products, the solutions of which show no absorption bands. It shows a remarkable degree of permanence as compared with chlorophyll, when exposed to the combined action of air and light. A chloroformic solution contained in a loosely-stoppered bottle may be exposed for weeks, or even months, to alternate sunlight and diffused daylight before its peculiar colour and all trace of absorption bands have disappeared. When the process is complete a yellow liquid results, which contains several products, all of them amorphous, one being easily soluble in water, and exceedingly bitter to the taste. The decoloration of a chlorophyll solution under the same circumstances would take place in a day or two.

Phyllocyanin dissolves easily in concentrated sulphuric, hydrochloric, and hydrobromic acids, yielding dark blue solutions, which show spectra differing from that of phyllocyanin, and no doubt contain compounds of the latter with acids. These compounds, however, are unstable; for, on the addition of water to the solutions, phyllocyanin is precipitated unchanged. Phyllocyanin shows no tendency to combine with weaker acids, such as phosphoric, oxalic, tartaric, or citric acid.

Phyllocyanin dissolves easily in dilute caustic potash or soda lye. The solution gives precipitates of various shades of green with earthy and metallic salts, such as barium chloride, calcium chloride, lead acetate, and cupric acetate, and these might be called phyllocyanates. It seems, however, that by mere solution in alkali, phyllocyanin undergoes some change, for if acetic acid in excess be added to the solution, and it be then shaken up with ether, the precipitate dissolves in the ether, giving a solution which shows the bands of phyllocyanin; but if the whole be left to stand some time, the colour of the ethereal solution changes from green to brown, and it now shows a distinct and peculiar spectrum, characterised by two bands in the red and two fine but well-marked bands in the green, the third and fourth bands of phyllocyanin having disappeared, while the fifth still remains. The body yielding this spectrum has been prepared and found to yield microscopic crystals like phyllocyanin. A different product is formed when hot alkaline lye, or, what is better, boiling alcoholic potash or soda, is employed. It crystallises in small rosettes, which are green by transmitted, of a fine purple by reflected, light. Its solutions have a dull purple colour, and exhibit a distinct spectrum characterised by a broad, very dark band in the green. It may be identical with one of the products obtained by Hoppe-Seyler from his chlorophyllan with alkalis.

The concluding part of the paper treats of what may be called double compounds of phyllocyanin, into which metals and acids, especially organic acids, enter as constituents. Phyllocyanin seems to act the part of a weak base, uniting with strong acids and forming unstable compounds. In acetic acid it merely dissolves without yielding any compound. In like manner, when freshly precipitated cupric oxide or zinc oxide is added to a solution of phyllocyanin in boiling alcohol no combination takes place. A very different effect is observed when either of the two oxides is employed along with acetic acid. When cupric oxide is added to a solution of phyllocyanin in boiling acetic acid the solution acquires at once a deep greenish blue colour, and it no longer contains uncombined phyllocyanin, for its spectrum is different, and, on standing, it deposits lustrous crystals, which doubtless consist of a compound containing phyllocyanin, acetic acid, and copper. If zinc oxide be employed, a similar effect is observed: the liquid acquires an intense green colour like that of a chlorophyll solution, and now contains the corresponding acetate of phyllocyanin and zinc. The same phenomenon is seen when ferrous oxide, manganese oxide, or silver oxide is taken, liquids of various shades of green being obtained which contain phyllocyanin compounds; but no similar compounds are formed when potassium, sodium, barium, calcium, magnesium, or lead acetate is employed. Acetic acid is, however, not the only acid which yields the reaction. If palmitic, stearic, oleic, tartaric, citric, malic, or phosphoric acid be employed, it takes place just as with acetic acid, but in some cases time is required for its completion. Oxalic acid, however, seems to be without effect, and tartaric acid fails in some cases.

The behaviour of phyllocyanin towards zinc oxide in the presence of acids may serve to explain a peculiar phenomenon first observed by Prof. Church, and subsequently described by Tschirch. The former took chlorophyll that had become brown on standing, and, acting on it with zinc powder, obtained a body yielding green solutions, which he took to be regenerated chlorophyll. Tschirch acted on Hoppe-Seyler's chlorophyllan with zinc powder and observed the same phenomena, the conclusion at which he arrived being the same, viz. that chlorophyll

is reproduced from chlorophyllan by reduction. It is probable, however, that what they obtained was in reality a zinc compound of phyllocyanin, and would have been formed just as well by using zinc oxide. Chlorophyllan is probably an impure substance containing some fatty acid along with phyllocyanin, so that by the action of zinc oxide it may yield a compound similar to those above mentioned. The experiment was tried with the crude product obtained by passing hydrochloric acid gas into a solution of chlorophyll. Some of this was dissolved in alcohol, and the solution was boiled with zinc oxide, when it gradually became of a bright green like a solution of chlorophyll, but its spectrum differed, being identical with that of the zinc compounds obtained directly from phyllocyanin.

May 21.—"Contributions to the History of the Pleiocene and Pleistocene Deer. Part I. *Cervus verticornis, Cervus savini.*" By W. Boyd Dawkins, M.A., F.R.S., F.G.S., Professor of Geology and Palæontology in the Victoria University.

The numerous cervine remains which occur in the various collections in Britain and on the Continent have been studied by the author for the last twenty-five years, and in this communication two species, the one hitherto ill-defined, and the other new to science, have been described.

The first, or *Cervus verticornis*, Dawkins, remarkable for the singular forward and downward curvature of the first tine, is represented by a large series of skulls and antlers, which enable the author to define the changes in antler-form from youth to old age, as well as to relegate it to the division of deer with palmated antlers, and to establish its geological age to be Pleiocene and early Pleistocene in Norfolk and Suffolk.

The second, or *Cervus savini*, is represented by several skulls and many antlers, which present considerable modifications in form at varying ages. It also belongs to the section of deer with palmated antlers, and is probably the ancestral form of the extinct (*Cervus browni*, Dawkins) and living (*C. dama*) types of fallow deer. It has hitherto only been met with in the early Pleistocene forest-bed series of Norfolk and Suffolk.

Mathematical Society, May 14.—J. W. L. Glaisher, F.R.S., President, in the chair.—B. Hanumanta Rau, Madras, was elected a member.—Papers were read by Rev. T. C. Simmons, on an application of determinants to the solution of certain types of simultaneous equations; and by H. M. Jeffery, F.R.S., on binodal quartics, on the latter of which the President, S. Roberts, F.R.S., and the author made further remarks.—Mr. Tucker read part of a paper by Prof. J. Larmon on the flow of electricity in a system of linear conductors.

Zoological Society, May 19.—F. Du Cane Godman, F.R.S., in the chair.—A letter was read from the Rev. G. H. R. Fisk, C.M.Z.S., respecting the capture of a Sea-snake among the rocks at the entrance to Table Bay, which he believed to be referable to *Pelamis bicolor*.—A letter was read from Mr. B. Crowther, stating that he was about to send the Society a pair of Duckbills (*Ornithorhynchus paradoxus*), and giving some instructions as to the treatment of these animals in captivity.—Mr. F. Day exhibited and made remarks on a curious specimen illustrative of an extensive injury to the intestines of a Trout and its subsequent recovery therefrom. Mr. Day also exhibited a piece of the sifting-apparatus of the Basking-Shark, together with specimens of the food upon which it lives; and an example of the Vendace taken in Derwentwater Lake.—Mr. Osbert H. Howarth exhibited a specimen of coral of the genus *Dendrophyllia* attached to a brown stoneware bottle, which had been dredged up in the Atlantic, off Madeira, at a depth of about fifteen fathoms.—A communication was read from Prof. J. von Haast, C.M.Z.S., on *Dinornis oweni*, in which the author gave a detailed description of the bones of this recently-discovered new species of the extinct wingless birds of New Zealand, which was remarkable for its small size.—A communication was read from Dr. St. George Mivart, F.R.S., containing notes on the genetic affinities of the group of Pinnipeds.—Dr. F. H. H. Guillemard read the third part of his report on the collection of birds formed during the voyage of the yacht *Marchesa*. The paper dealt with the birds obtained on the island of Sumbawa, a locality hitherto almost unknown to ornithologists. During the *Marchesa's* short visit examples of thirty-nine species were collected. Of these, two (*Turnix powelli* and *Zosterops sumbavensis*) were new to science. The remaining species had been previously recorded from islands to the eastward or westward in the same group.—A communication was read from Dr. Hubrecht, C.M.Z.S., containing a description of a Pennatulid obtained by Capt. St. John in the Japanese Sea at a depth of seventy-one fathoms. A careful examination of the specimen in question induced the author to assign it to a new genus and species, which he proposed to name *Echinoptilum mackintoshii*.—Mr. Herbert Druce, F.Z.S., read a paper on some new species of Lepidoptera-Heterocera, founded on specimens obtained by the late Mr. C. Buckley in Ecuador, to which were added descriptions of some recent acquisitions of the same group from various other localities.—Mr. F. D. Godman, F.R.S., read descriptions of the Lepidoptera collected by Mr. H. H. Johnstone on Kilimanjaro. The collection contained examples of twenty-one species of the Rhopalocera and six of Heterocera. Of the Rhopalocera the author described three species as new.

Geological Society, May 13.—Prof. T. G. Bonney, D.Sc., LL.D., F.R.S., President, in the chair.—William Horton Ellis and Prof. J. Hoyes Panton, M.A., were elected Fellows; and Prof. J. Gosselet, of Lille, a Foregn Member of the Society.—The following communications were read:—On the Ostracoda of the Purbeck formation, with notes on the Wealden species, by Prof. T. Rupert Jones, F.R.S., F.G.S.—Evidence of the action of land-ice at Great Crosby, Lancashire, by T. Mellard Reade, F.R.S.—The North Wales and Shrewsbury coal-fields, by D. C. Davies, F.G.S. After discussing the origin of coal-beds, and the causes of their variation in structure and quality, the author proceeded to describe the North Wales and Shrewsbury coal-field, which consists of three parts: (1) The Shrewsbury field south of the Severn, exclusively composed of Upper Coal-measures; (2) the tracts north of the Severn, extending from near Oswestry to north of Wrexham; and (3) the Flintshire coal-field. The first and second are separated from each other by the alluvial plain of the Severn and Vyrmoy, and the second and third by the Great Bala and Yule faults. Some remarks on the scenery of the Welsh border-land followed, and then a general section of the Carboniferous system, as developed in the country described, was given, the Permian beds being included, as the author considered them the upper portion of one great division of Palæozoic time. The section was as follows, with the maximum thickness of each subdivision:—

	Thickness in yards	
1. Dark red Sandstone	210	Permian, 590 yards.
2. Ifton or St. Martin's Coal-measures	75	
3. Red marls with calcareous matter...	180	
4. Green rocks and Conglomerates ...	125	
5. Upper Coal-measures	80	Coal-measures, 665 yards.
6. Cefn rock to Cefn coal	100	
7. Cefn coal to Lower yard-coal... ...	270	
8. Lower yard-coal to Chwarcle coal...	80	
9. Chwarcle coal to Millstone Grit ...	135	
	1255 yards	

A detailed description of the strata was next given, beginning with the lowest, together with details of each coal-seam as worked in various parts of the field. After describing the beds from the Millstone Grit to the Cefn rock in the North Wales coal-field, the author proceeded to notice the Upper Coal-measures and Permian strata in the Shrewsbury area, and showed that no break exists between the two, the former passing gradually into the latter. He then discussed the probability of Lower Coal-measures existing beneath the upper beds near Shrewsbury, and showed from sections that the existence of the lower measures might be anticipated. A similar inquiry as to the presence of the Coal-measures beneath the New Red Sandstone of the Vale of Clwyd should also, in the author's opinion, be answered in the affirmative. The organic remains found in the different beds were briefly noticed, and then the faults of the district were discussed at some length. The principal faults run north and south, with an upthrow to the east, but are crossed by lines of fracture running east and west. In conclusion, the correlation of the strata in the North Wales and Shrewsbury coal-fields, and especially of the coal-seams, with the beds found in other parts of Great Britain, was discussed, and a section was given to show the representation of the different measures in various coal-basins. The author was disposed to adopt four subdivisions rather than three only, as usually accepted, and pointed out some of the characteristics of each subdivision.

Royal Meteorological Society, May 20.—Mr. R. H. Scott, F.R.S., President, in the chair.—Dr. H. Dobell and Mr. J. N. Longden were elected Fellows of the Society.—The following papers were read:—The temperature zones of the earth considered in relation to the duration of the hot, temperate

and cold period, and to the effect of temperature upon the organic world, by Dr. W. Koppen, Hon.Mem.R.Met.Soc.—Velocities of winds and their measurement, by Lieut.-Col. H. S. Knight, F.R.Met.Soc. The author, after describing the various ways of ascertaining the direction and velocity of the wind, makes several suggestions for the improvement of Robinson's anemometer.—On the equivalent of Beaufort's scale in absolute velocity of wind, by Dr. W. Koppen, Hon.Mem.R.Met.Soc. The author refers to Mr. C. Harding's paper read before the Society in December last on the anomalies in the various wind velocities given by different authors as equivalents for the numbers in Beaufort's scale, and, as illustrating the point, calls special attention to the want of agreement between the velocities obtained by Mr. Scott and those subsequently obtained by Dr. Sprung, and confirmed by himself.—Note on a peculiar form of auroral cloud seen in Northamptonshire, March 1, 1885, by the Rev. James Davis.

EDINBURGH

Royal Physical Society, May 20.—Prof. Duns, D.D., F.R.S.E., President, in the chair.—The following communications were read, viz. :—On new Selachian remains from the Calciferous Sandstone series, by Ramsay H. Traquair, M.D., F.R.S., L. and E.—Observations on living Cephalopoda, and note on *Loligo forbesii* (Steenstrup), by W. E. Hoyle, M.A., F.R.S.E.—Note on ulceration of the skin of a fish, by G. Sims Woodhead, M.D., F.R.C.P.E.—Note on the presence of a double dorsal vessel in certain earthworms, by Frank E. Beddard, M.A., F.R.S.E.; F.Z.S.—The north-west coasts of Sutherland and their bird-life, by John A. Harvie-Brown, F.Z.S., F.R.S.E.—Note on the contents of two bits of clay from the elephant bed at Kilmaurs in 1817, by James Bennie, H.M. Geological Survey. The Secretary (Mr. Robert Gray, V.P.R.S.E.) drew attention to several interesting birds that had been taken during the present month on the Island of May by Mr. Agnew, light-house-keeper, and forwarded to Mr. J. A. Harvie Brown, in whose collection they had since been placed. These were two specimens of the Ortolan bunting (*Emberiza hortulana*) and others of the pied flycatcher (*Muscicapa atricapilla*), red-backed shrike (*Lanius collurio*). The Secretary remarked that these birds had occurred during their spring migration, and that in the case of the Ortolan bunting the captures proved that any Scottish specimens of the bird that had been recorded could not be said to be escaped birds, seeing that they had been in company with well-known migratory species, and were in all likelihood on their way to Scandinavia, where they were known to breed.

SYDNEY

Linnean Society of New South Wales, March 25.—Prof. W. J. Stephens, M.A., F.G.S., President, in the chair.—The following papers were read :—On a Devonian fossil, allied to *Worthenia* (de Koninck), from New South Wales, by F. Ratte.—On the Phoriaspongiæ (Marshall), by Dr. R. von Lendenfeld. Both species described by Marshall have been found by the author, who considers them, together with some new species discovered by himself, to be Ceraospongiæ, with fleshspicules, and not, as Marshall had supposed, Desmacidanidæ, or Cianidæ, living in sand. There exist many sponges on the Australian shores with a skeleton consisting of arenaceous fibres, which form an irregular network, thus connecting the Phoriaspongiæ with the ordinary horny sponges. Eleven species of horny sponges, with fleshspicules, have been found in Australian waters. Their spicules are described and their relative position to other sponges discussed. The author upholds his previously published views on the relationship between Ceraospongia and Monactinellidæ, and discusses the hypothesis recently put forward by Vosmaer.—Synonymy of, and remarks upon, four species of shells, originally described by Dr. J. E. Gray, by John Brazier, C.M.Z.S.,'&c.—Notes on the Australian Amphipoda, by William A. Haswell, M.A., B.Sc., &c.—On the Toxoglossate Mollusca of New Zealand, by Capt. F. W. Hutton, F.G.S.—Notes descriptive of some rare Port Jackson fishes, by J. Douglas Ogilby, Assistant in Zoology, Australian Museum, Sydney.

PARIS

Academy of Sciences, May 25.—M. Bouley, President, in the chair.—After the formal proceedings, the President referred in the following terms to the late Victor Hugo :—"France is to-day widowed of one of her great writers, a man by whose works of genius the glory of our land has been spread furthest and widest during the present century. Victor Hugo is about to descend into the grave, but by the greatness of his writings he is himself saved from death. Years may henceforth roll on until they are reckoned by hundreds and thousands ; but in the series of future ages there never will be a time when André Chénier's lines on Homer will not also be applicable to our great poet :—

"Trois mille ans ont passé sur la cendre d'Homère,
Et depuis trois mille ans Homère respecté
Est jeune encor de gloire et d'immortalité."

For the work of Victor Hugo belongs to that class which defies years and for everlasting ages secures the youth of glory and immortality to those by whom it has been accomplished. And now the five Academies of the French Institute must consider it a sacred duty to render like homage to this great memory. Our Bureau has the honour of asking you, in sign of mourning, to suspend your proceedings for to-day." The proposal having received general assent, the public meeting of the Academy was adjourned.—Account of an elliptical halo of unusual brilliancy, and evidently connected with the halo of 22° so frequently noticed for some weeks past, observed during the afternoon of Tuesday, May 19, by M. A. Cornu.—A contribution to the history of sulphur and quicksilver, by M. Berthelot.—Note on the algebraic integers of linear equations, by M. E. Goursat.—Demonstration of a particular property of geometrical curves of double curvature, by M. V. Jamet.—On the verification of the laws of vibration of circular plaques, second note, by M. E. Mercadier.—Remarks on the peculiar properties of the electric current generated by the rheostatic machine, by M. Gaston Planté.—On a method of determining and recording the charge of electric accumulators, by MM. A. Crova and P. Garbe. The authors claim to have discovered a means of determining and automatically recording the exact amount of energy stored in accumulators, and so regulating the discharge as to be able to ascertain the quantity still held in reserve at any given moment. The machines used in their experiments were of the Planté type modified by Faure.—Note on the phenomenon of crystalline superfusion of sulphur, and on the velocity of transformation from prismatic to octahedric sulphur, by M. D. Gernez.—Remarks on the composition of the persulphuret of hydrogen, and on the nacreous variety of sulphur, by M. P. Sabatier.—Note on the product of addition $PhFl^2Br^2$ obtained by the action of bromine on the trifluoride of phosphorus, by M. H. Moissan.—A synthesis of some specimens of anorthite recently obtained from the gas-works of Vaugirard, by M. Stanislaus Meunier.—Note on the microscopic anatomy of *Dentalium entale* from the Roscoff coast, by M. H. Fol.—On the Penian formations (red sandstones associated with clay-stone and felspar grit) prevalent in the secondary ranges of the Vosges Mountains, by M. Ch. Vélain.—The election of M. Laguerre as member of the section for geometry in the place of the late M. Serret was confirmed by the President of the Republic.

BERLIN

Physiological Society, May 1.—Dr. Raudnitz had subjected to examination, by new experiments, a statement advanced by Profs. Eulenberg and Landois, and which was controverted by several investigators, namely, that there was a vasomotor centre having its seat in the cortex of the cerebrum. For the measurement of the peripherical temperature he made use of mercurial thermometers, which he fastened into the paw of the animal. It was found, by preliminary experiments, that subcutaneously inserted thermometers, on stimulation of the nerves or of the central organs, yielded variations of temperature essentially different from, often opposite to, those fixed into the paw—a circumstance referable, no doubt, to the influence of the contraction of the muscles. Thermo-electric piles, again, were not suitable for application, for the reason that it was not possible to find for the second contact a medium that remained constant as far as 0°·04 C. Dr. Raudnitz had investigated a large number of conditions influencing the temperature of the skin, such as motion, the muscular rhythm, paralytic poisons, the situation of the paralysed animal, &c. Of the phenomena observed in the course of such investigation, the fact was specially striking that the difference in the situation of the investigated extremity was able to give rise to differences of temperature as great as 13° C. The results of the whole investigation went to show that it was not possible to demonstrate with certainty the existence of a vaso-motor centre in the cortex of the cerebrum. In the case of each epileptic attack resulting from stimulation of the membrane the change of tem-

perature in the skin was induced in large part by the muscular movement, and in part also otherwise. Whether, however, the influence of the stimulation of the brain on the vaso-motor system was direct or indirect was a question not to be determined either by experiments of stimulation or by extirpation of the part of the cerebral cortex concerned. — Dr. Leo communicated his experiments on the formation of fat and conveyance of fat in the case of phosphorus-poisoning. Seeing that some physiologists ranged themselves on the side of the view that fat, and especially in fatty liver after phosphorus-poisoning, was formed in the body through decomposition of albumen, but others, on the contrary, held that the fat of the internal organs was derived from the alimentary fat, either directly conveyed to these organs, or transported from the skin, where it had been deposited, the speaker instituted the following experiments: two young guinea-pigs of the same litter, of very similar constitution, and of almost the same dry weight, were kept in a state of hunger for a considerable time; then one was poisoned with phosphorus, and after three days both were killed. On determining the fatty contents of each of the animals, it was found that the poisoned animal showed a very considerably larger percentage of fat than the other. It had now to be ascertained what amount of fat an animal experimented on had before, and what amount it had after the phosphorus-poisoning. For this purpose two rats were employed, living under precisely the same conditions. One of them, accordingly, was killed on the same day on which the poisoning of the second begun. After three days the latter was likewise killed, and an essentially smaller quantity of fat was found in the poisoned animal than in the former. Finally, experiments were made with eighteen frogs, of which six were killed before the poisoning, six after the poisoning, and at the same time with these, six control frogs were killed. The result was that the six poisoned frogs contained a larger per cent. of fat than the six killed before the poisoning, and than the six unpoisoned and in other respects similar frogs. In all experiments the fatty contents of the liver after the phosphorus-poisoning were considerably greater than in the case of the unpoisoned animals. The increase per cent. of the liver fat, in comparison with the dry substance, tended to show with great probability that fat was not only formed anew, but was conveyed to the liver from other quarters. According to present views fat was formed in the body of the animal only by decomposition of the albumen, and it was conjectured that the lecithin was an intermediate product of this transformation. The quantitative determination of the lecithin in the animals poisoned with phosphorus, and in the control animals yielded, however in both, like percentages, so that this conjecture was not confirmed by the experiment.

Rome

Reale Accademia dei Lincei, March 15.—The unthinkable; a logico-psychological note by Signor Bonatelli. In this note the author proposed to show that what is called the impossibility of thinking a thing is not really an impossibility on the part of the thinking subject to form any given thought, but rather either the absolute impossibility of imagining or the impossibility of the existence of the object. And in this fact there is found a confirmation of that philosophical doctrine which maintains the existence of the ideal. That which is absolutely unthinkable is out of all relation to our thought, and we can say nothing about it.—Concerning a vase found at Metapontum with a Greek alphabet of the Achæan colonies of South Italy. Signor Barnabei exhibited a vase found in a burying-place during the excavations now being carried on at Metapontum, and which may be considered one of the most important discoveries that have been made in recent times. The vase is in perfect preservation and shows by its form that it belongs to about 300 B.C. In the annular space surrounding the raised rim the letters of the entire alphabet are inscribed. Signor Barnabei, after citing the opinions of various authors on the origin of writing, showed that it could not be attributed to the Phœnicians, but that the art of writing was actually introduced into Italy by the Greeks.—On the distribution in latitude of the solar maculæ, faculæ, protuberances, and eruptions observed in 1884 in the Royal Observatory of the College of Rome. In this note Signor Tacchini explained at length the methods by which his observations on the solar maculæ, faculæ, and protuberances were made, and the tables relating to them drawn up, as well as the means taken to insure the accuracy of both. He defended, against the criticisms of Prof. Respighi, the conclusions which he had laid before the last meeting of the Academy on the strength of his own observations and those of other astronomers. —Resumption of the observations of red glows. Prof. Riccò communicated the conclusion of his previous note, in which he gave an account of all the observations made by him on red glows from December, 1883, to April, 1884. As some features of the phenomenon would induce us to admit the presence of an extremely fine dust at a great height in the atmosphere, Prof. Riccò wished to ascertain the fact as to whether fresh dust had fallen during and after the glows. But the examination of the dust collected at those times in rain-water or water long exposed to the air, showed no traces of fresh dust in the atmospheric deposits, and, in particular, no recognisable traces of volcanic dust.—Other communications:—Prof. Millosevich communicated the observations made by him on a new planetoid between Mars and Jupiter (245), discovered by Signor Borelly.—Drs. Ciamician and Silber explained the reactions by means of which they had succeeded in obtaining acetyl-pyrrol in a state of perfect purity without any trace of pyrrol-methyl-ketone. They also stated the result of their experiments with a view to obtain a sulphur acid from pyrrol-methyl-ketone: experiments which show clearly the analogy between pyrrol, pyrridin, and benzol.—Prof. Besso communicated a note by himself on trinomial equations, and in particular on those of the seventh degree. —Dr. Bianchi communicated a note by himself on the triple orthogonal systems of Weingarten.

Christiania

Society of Science, May 4.—The President, Prof. Guldberg, in giving an account of the working of the Society last year, stated that there had been eighteen meetings, and that fifty-two articles and papers had been presented by members.—The number of members is at present 112.—Prof. Lochman gave a lecture on biology in relation to life.

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