and 1888, they would indeed have changed places with no one. After giving further details of the expedition, the lecturer said that on October 30 they sorrowfully bade farewell to Kilima-Njaro, the most beautiful and interesting, as well as the grandest, region in the dark continent. At the conclusion of the paper a series of photographs illustrative of some features of the expedition was exhibited by lime-light, and explained by Mr. Ravenstein. A vote of thanks to Dr. Meyer was proposed by Mr. Joseph Thomson. seconded by Mr. Douglas Freshfield, and heartily accorded.

A NEW GREEN VEGETABLE COLOURING MATTER.[1]

THE seeds of the *Trichosanthes palmata* are inclosed in a rounded scarlet fruit and embedded in a green bitter pulp. The bitter principle has been shown by Mr. D. Hooper to be a glucoside differing from colocynthin, and he has named it trichosanthin. The green colouring matter, when freed from the trichosanthin and fatty matter, yields a solution closely resembling a solution of cholorophyll. It is green in thin and red in thick layers, and has a red fluorescence. The spectrum, however, is very different. Taking the thickness and strength yielding the most characteristic spectrum, it may be described thus :—The first band begins (penumbra) at W.L. 654 and ends about W.L. 615 ; from this there is a small amount of absorption till the second band begins at W.L. 593·4, and continues to W.L. 566·8, with the maximum absorption near the less refrangible end ; from this there is no perceptible absorption till the third band, which extends from W.L. 548·4 to 534·8 ; there is a fourth band, very faint, with its centre about W.L. 510·6, and a fifth extending from about W.L. 485 to W.L. 473·4. Comparing this with the chlorophyll spectrum, it will be seen that the first band has its centre almost midway between the two chief chlorophyll bands, but that bands III., IV., and V. are probably coincident with chlorophyll bands. When the trichosanthes colouring matter is treated with ammonia sulphide the spectrum is completely changed. The first and most prominent band slowly decreases in strength and finally disappears, two new bands appear in the space between bands I. and II. of the original spectrum ; band II. is apparently displaced towards the violet end and intensified ; and band IV. is greatly widened. Chlorophyll under the same treatment behaves in a totally different manner, and the two spectra become almost complementary. When, however, the trichosanthes colouring matter and chlorophyll are both treated with hydrochloric acid the result is very different, for the two spectra have now three bands in common. The first band in the trichosanthes spectrum has disappeared, and the spectrum is practically reduced to one of three bands corresponding in position with bands II., III., and IV. of the altered chlorophyll spectrum. Band I. of the chlorophyll spectrum has no representative in the trichosanthes spectrum. The conclusions to be derived from a study of these spectra seem to be that we have in the trichosanthes colouring matter a substance in which the "blue chlorophyll" of Sorby or the "green chlorophyll" of Stokes is replaced by some other substance easily decomposed by reducing agents and acids. Farther, if we assume with Schunck that the product obtained by acting on chlorophyll with hydrochloric acid is the same as Frémy's phyllocyanin, this, too, must be a mixture, one constituent of which is obtained by acting on the trichosanthes colouring matter with acid, while the other is, apparently, the unaltered substance yielding band I. in the chlorophyll spectrum.

SOCIETIES AND ACADEMIES

LONDON.

Royal Society, March 13.—"On the Organization of the Fossil Plants of the Coal-measures. Part XVII." By William Crawford Williamson, LL.D., F.R.S., Professor of Botany in the Owens College, Manchester.

In 1873 the author described in the Phil. Trans. an interesting stem of a plant from the Lower Carboniferous beds of Lancashire, under the name of *Lyginodendron Oldhamium*. He also called attention to some petioles of ferns, more fully described in 1874, under the name of *Rachiopteris aspera*. The former of these plants possessed a highly organized, exogenously developed xylem zone, whilst the *Rachiopteris* was only supplied with what looked like closed bundles. Since the dates referred to, a large amount of additional information has been obtained respecting both these plants. Structures, either not seen, or at least ill-preserved, have now been discovered, throwing fresh light on their affinities ; but most important of all is the proof that the *Rachiopteris aspera* is now completely identified as the foliar rachis or petiole of the *Lyginodendron* : hence there is no longer room for doubting that, notwithstanding its indisputable possession of an exogenous vascular zone, the bundles of which exhibit both xylem and phloëm elements along with medullary and phloëm rays, it has been a true Fern. Though such exogenous developments have now been long known to exist amongst the Calamitean and Lycopodiaceous stems, as well as in other plants of the Carboniferous strata, we have had no evidence until now that the same mode of growth ever occurred amongst the Ferns. Now, however, this Cryptogamic family is shown to be no longer an exceptional one in this respect. All the three great divisions of the Vascular Cryptogams—the Equisetaceæ, the Lycopodiaceæ, and the Homosporous Filices of the primæval world—exhibited the mode of growth which is confined, at the present day, to the Angiospermous plants. A further interesting feature of the life of this *Lyginodendron* is seen in the history of the development of its conspicuous medulla. In several of his previous memoirs, notably in his Part IV., the author has demonstrated a peculiarity in the origin of the medulla of the Sigillarian and Lepidodendroid plants. Instead of being a conspicuous structure in the youngest state of the stems and branches of these plants, as it is in the recent Ferns, and as in most of the living Angiosperms, few or no traces of it are observable in these fossil Lycopodiaceæ. In them it develops itself in the interior of an apparently solid bundle of tracheæ (within which doubtless some obscure cellular germs must be hidden), but ultimately it becomes a large and conspicuous organ. The author has now ascertained that a similar medulla is developed, in precisely the same way, within a large vascular bundle occupying the centre of the very young twigs of the *Lyginodendron*. But in this latter plant other phenomena associated with this development make its history even yet more clear and indisputable than in the case of the Lycopods. The entire history of these anomalous developments adds a new chapter to our records of the physiology of the vegetable kingdom.

Further light is also thrown upon the structure of the *Heterangium Grievii*, originally described in the author's memoir, Part IV. This plant presents many features in its structure suggesting that it too will ultimately prove to be a Fern. The specimens described in the above memoir, published in 1873, all possessed a more or less developed exogenous xylem zone. But the author has now obtained other, apparently younger examples in which no such zone exists.

He has discovered the stem of a genus of plants (*Bowmanites*), hitherto known only by some fruits, the detailed organization of which was originally described by him in the Transactions of the Literary and Philosophical Society of Manchester, in 1871. The structure of this new stem corresponds closely with what is seen in *Sphenophyllum* and in some forms of *Asterophyllites* (Memoir V., Phil. Trans., 1874, p. 41, *et seq.*). This discovery makes an addition to our knowledge of the great Calamarian family, to which the plant obviously belongs.

Further demonstrations are also given by the author, illustrating some features in the history of the true Calamites. Attention is called to the fact that, whilst the large, longitudinally-grooved and furrowed inorganic casts of the central medullary cavities of these plants are extremely common, we never find similar casts of the smaller branches. The cause of this is demonstrated in the memoir. In these young twigs the centre of the branch is at first occupied by a parenchymatous medulla. The centre of this medulla becomes absorbed at a very early age, leaving the beginnings of a small fistular cavity in its place ; but, if any plastic mud or sand entered this cavity when the plant was submerged, the surface of such a cast would exhibit no longitudinal groovings, because there would be nothing in the remaining medullary cells surrounding the cast to produce such an effect. It was only when the further growth of the branch was accompanied by a more complete absorption of the remaining medullary cells, causing the cavity thus produced to

[1] Abstracted from a paper by C. Michie Smith, "On the Absorption Spectra of Certain Vegetable Colouring Matters," read before the Royal Society of Edinburgh, March 17, 1890, and communicated by permission of the Council.

be bounded by the inner wedge-shaped angles of the longitudinal vascular bundles constituting the xylem zone, that such an effect could be produced. After that change any inorganic substance finding its way into the interior of this cavity had its surface so moulded by the wedges as to produce the superficial ridges and furrows so characteristic of these inorganic casts.

March 27.—"The Rupture of Steel by Longitudinal Stress." By Chas. A. Carus-Wilson. Communicated by Prof. G. H. Darwin, F.R.S.

This paper gives an account of experiments made with a view to determining the nature of the resistance that has to be overcome in order to produce rupture in a steel bar by longitudinal stress.

The stress required to produce rupture is in every case computed by dividing the load on the specimen at the moment of breaking by the contracted area at the fracture measured after rupture; this stress is called the "true tensile strength" of the material.

It is well known that any want of uniformity in the distribution of the stress over the ruptured section causes the bar to break at a lower stress than it would if the stress was uniformly distributed. Hence anything that causes want of uniformity is prejudicial; for instance, a groove turned in a cylindrical steel bar will produce want of uniformity, and will consequently be prejudicial, the stress at rupture being lower according as the angle of the groove is more acute. The most favourable condition of test might appear to be that in which a bar of uniform section throughout its length was allowed to draw out freely before breaking, since in this case the stress must be most uniformly distributed.

Experiment, however, shows that the plain bar is not always the strongest. So long as the want of uniformity of stress is considerable, owing to the groove being cut with a very sharp angle, the plain bar is stronger than the grooved bar; but, if the groove be semicircular instead of angular, the grooved bar is considerably stronger than the plain, in spite of the fact that the stress is more uniformly distributed in the latter.

It would seem, then, that we can strengthen a bar over any given section by adding material above and below it, the change in section being gradual; but such an addition of material cannot strengthen the bar if rupture is caused by a certain intensity of tensile stress over the ruptured section; the added material cannot increase the resistance of the ruptured section to direct tensile stress, but it can increase the resistance to the shearing stress.

The resistance of a given section of a steel bar does not, then, depend on its section at right angles to the axis, but on its section at 45° to the axis, for in that direction the shearing stress is a maximum. From this it would seem that the resistance overcome at rupture is the resistance of the steel to shear.

Experiments were made to see whether the resistance of steel to direct shearing bore to its resistance to direct tension the ratio required by the above theory; since the greatest shearing stress is equal to one-half the longitudinal stress, we should expect to find the resistance to direct shearing equal to one-half of the resistance to direct tension.

A series of experiments were made, with the result that the ultimate resistance to direct shearing was within, on the average, 3 per cent. of the half of that to direct tension.

The appearance of the fracture of steel bars is next discussed. It would appear that when the stress is uniformly disturbed in the neighbourhood of the ruptured section, the fracture is at 45° to the axis, the bar having sheared along that plane which is a plane of least resistance to shear. The tendency to rupture along a plane of shear may be masked by a non uniform distribution of stress.

Two plates of photographs are added, showing examples of steel bars broken by shearing under longitudinal stress.

Physical Society, March 21.—Prof. W. E. Aryton, F.R.S., President, in the chair.—The following communications were read:—The Villari critical points in nickel and iron, by Herbert Tomlinson, F.R.S. Villari has shown that the permeability of iron is increased by longitudinal traction provided the magnetizing force does not exceed a certain limit, but beyond this limit traction produces a decrease of permeability. The value of the force for which traction produces no change in the permeability is known as the Villari critical point. As far as the author is aware, no previous observer has found a similar critical point for nickel, but by confining his attention to *temporary* magnetization he has detected such a point with comparative ease. He has also examined the variation of the Villari critical points in iron and nickel with change of load, and has investigated the influence of permanent strain on these points. The experiments were made by the ballistic method, using wires about 400 diameters long. In each set of observations the permeability was obtained with various loads, the magnetizing force being kept the same, and with each load the circuit was closed and opened until the swings on make and break were equal; this swing was taken as a measure of the induction under the given load. Several diagrams accompany the paper, in which load and percentage change of permeability are plotted, regard being had to sign. The author finds that for annealed unstrained iron the critical value of the force decreases as the load increases, and that the Villari point is much lower for *temporary* than for *total* magnetization. With a load of 4·7 kilos on a 1 mm. wire, the value of the force giving the temporary point was 2·8 C.G.S. units. He also found that for a given magnetizing force there are generally two loads which have no effect on the temporary magnetization. With unstrained nickel the critical value of the force is much greater than in iron, being about 114 C.G.S. units for a load of 10 kilos on a wire 0·8 mm. diameter, and 67 for a load of 6·6 kilos. For a force of 21 units no critical point exists. Experiments on a permanently strained iron wire show that for magnetizing forces ranging from 0·03 to 0·3 there is no critical point, and all the resulting curves are identical. There is, however, considerable difference in the observations taken during loading and those taken on unloading. For greater magnetizing forces the curves cease to be identical, and the maximum increase of permeability becomes less and less until for a certain force the curves begin to cut the load line. As the force increases beyond this value the point of cutting approaches the origin, and the curves begin to cut the load line in two points. Further increase of force to 3 C.G.S. units causes the first point to disappear, and the second point recedes from the origin. Finally, with sufficiently high magnetizing forces the second point cannot be reached before the wire breaks, and the curve lies entirely below the load line. With nickel the curves for very minute forces, like those of iron, are exactly the same for different values of the force, but they lie below the load line, *i.e.* the permeability is diminished by loading; there is no difference, however, in the loading and unloading curves. Beyond a certain value of the force the identity of the curves ceases, and that part of the curve near the origin bulges towards the load line. For a force a little over 21 C.G.S. units the permeability begins to increase with load, and the curve cuts the line in one point, which point recedes from the origin as the force increases. Mr. Shelford Bidwell said that Prof. J. J. Thomson, reasoning from the change of length by magnetization, had predicted a Villari point in cobalt when compressed, and this was verified experimentally. On applying similar reasoning to nickel he, (the speaker) did not expect to find a Villari point, and both Sir William Thomson and Prof. Ewing had searched in vain for one. In some experiments, not yet completed, he had examined the behaviour of nickel, both loaded and unloaded, when subjected to various magnetizing forces. These show that the metal always contracts when magnetized. For no load the contraction at first increased with the magnetizing force, but attains a maximum. With a moderate load the contraction is less for small forces, but for larger forces becomes equal and then exceeds the contraction of the unloaded wire. For greater loads the contraction is less than when unloaded for all values of the force.—On Bertrand's Idiocyclophanous prism by Prof. S. P. Thompson. This hitherto undescribed prism is a total reflection one made of calc-spar, which shows to the naked eye the rings and crosses such as are seen when a slice of spar is examined by convergent light in a polariscope. The spar is cut so that the light after the first reflection passes along the optic axis, and after a second reflection emerges parallel to the incident light. The rings and brushes are present in pairs, but two pairs may be seen by tilting the prism to one side or the other. This was demonstrated before the Society. Prof. Thompson also exhibited a similar prism cut from quartz. Owing to the feeble double-refracting of the substance, no conspicuous rings could be seen, but when examined by the lantern traces of such rings were visible.—On the shape of the movable coils used in electrical measuring instruments, by Mr. T. Mather. The object of this note is to determine the best shape of the horizontal section of swinging coils such as are used in D'Arsonval galvanometers,

electro-dynamometers, wattmeters, &c. Assuming constant period and constant moment of inertia about the axis of rotation, it is shown that for zero instruments, the best shape of the section is two circles tangential to the direction of the deflecting field at the point about which the coil turns. A table accompanies the paper, in which various forms of section are given, together with their relative deflecting moments per unit moment of inertia; the coils being taken of equal lengths and the current density constant. From this table it appears that ordinary D'Arsonval coils only give about 45 per cent. of the maximum deflecting moment, and ordinary Siemens' dynamometers from 40 to 53 per cent. The various assumptions made in the paper are shown to be justifiable in commercial instruments, and the modifications necessary in special cases are pointed out. Mr. C. V. Boys said he had, when working at his radio-micrometer, arrived at a shape similar to that recommended in the paper. He also noticed a peculiar relation true for all shapes where the length parallel to the axis of rotation is great compared with the breadth. Suppose a coil of any dimensions, then another coil of half the breadth and double the length and cross-section will be dynamically, electrically, and magnetically the same as the original; for the moment of inertia, the electric resistance, and the enclosed magnetic field are equal. The above relation is also true when the breadth is not small, if the cross pieces be thickened near the axis so as to make their moment of inertia proportional to their length. He inquired whether the author had considered the subject of grading movable coils; he himself was of opinion that, unlike fixed galvanometer coils, the wire near the axis should be thicker than that further away. The President remarked that in 1881 Prof. Perry and himself exhibited a wattmeter at the Society of Arts, whose movable coil somewhat resembled one of those in the paper, which gave a deflecting moment of 95 per cent. of the maximum. In designing the instrument they had felt that the ordinary method of using a comparatively large swinging coil was not the best, and this led them to the shape adopted.

Entomological Society, April 2.—Mr. Frederick DuCane Godman, F.R.S., Vice-President, in the chair.—Mr. Godman announced the death of Dr. J. S. Baly, of Warwick, the well-known Coleopterist, who had been a member of the Society for the last forty years.—Dr. Sharp exhibited and made remarks on a female specimen of *Temnochila quadricollis*, Reitt., which was the subject of a very unusual malformation of the nature termed "ectromélie" by Lacordaire.—Mr. R. W. Lloyd exhibited three specimens of *Elater pomonæ*, taken at Brockenhurst about the middle of March last.—Colonel Swinhoe exhibited, and read notes on, a number of butterflies of the genus *Euthalia*. He pointed out that the specimens described as a species by the name of *Euthalia sedeva* were only the females of *E. balarama*.—Mr. T. R. Billups exhibited male and female specimens of *Cecidomyia salicis-siliqua*, Walsh, which had just emerged from galls received from Mr. Cockerell, who had collected them on a species of sallow in Colorado. He also exhibited three species of Ichneumonidæ new to Britain, viz. *Ichneumon haglundi*, Holmgr.; *Phygadeuon rufo-niger*, Bridg.; and *Phygadeuon sodalis*, Tasch.—Mr. C. G. Barrett exhibited specimens of *Bryotropha obscurella*, Hein, and *Doryphora elongella*, Hein, two species of Micro-Lepidoptera new to Britain.—Dr. Thallwitz, of Dresden, contributed a paper entitled "Notes on some species of the genus *Hilipus*." These notes had reference to a paper on the genus *Hilipus*, by Mr. F. P. Pascoe, published in the Transactions of the Society for 1889.—Mr. E. Meyrick read a paper entitled "The Classification of the Pyralidina of the European Fauna."—Prof. Westwood communicated a paper entitled "Notes on certain species of Cetoniidæ."—Mynheer P. C. T. Snellen, of Rotterdam, contributed a paper entitled "A Catalogue of the Pyralidæ of Sikkim collected by H. J. Elwes and the late Otto Möller," and Captain Elwes read notes on the foregoing paper as an appendix. Mr. W. L. Distant, Colonel Swinhoe, Mr. McLachlan, and Mr. Jacoby took part in the discussion which ensued.

Zoological Society, April 1.—Dr. A. Günther, F.R.S., Vice-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 March 1890; and called special attention to a fine example of a rare Passerine Bird (*Hypocolius amplinus*) from Karachi, presented to the Society by Mr. W. D. Cumming, Curator of the Museum, Karachi; and to two Mantchurian Cranes (*Grus viridirostris*), presented to the Society by Mr. C. W. Campbell, of H.B.M.'s Consular Service, Corea.—Mr. J. H. Gurney, Jun., exhibited and made remarks on a hybrid between the Tree-Sparrow (*Passer montanus*) and the House-Sparrow (*P. domesticus*), bred in captivity at Norwich.—Mr. W. B. Tegetmeier, exhibited a specimen of a Greek Partridge, shot in the Rhone Valley, and of an abnormal Viper.—Mr. A. Smith-Woodward exhibited and made remarks on a specimen of a Mesozoic Palæoniscid Fish from New South Wales, and pointed out that the structure of its pelvic fins seemed to confirm the recent opinion that the Palæoniscidæ are related to the Acipenseridæ and not to the Lepidosteidæ. The author believed the specimen exhibited to be the only one of the kind in existence.—Mr. C. M. Woodford made some remarks on the fauna of the Solomon Islands; and exhibited a large number of photographs in illustration of his remarks and of his recent explorations in these islands.—A communication was read from Dr. R. W. Shufeldt, entitled "Contributions to the Study of *Heloderma suspectum*," containing a complete account of the osteology and anatomy of this venomous Lizard. A list of the literature on the subject was added.—Dr. A. Günther, F.R.S., read the descriptions of new species of Deep-sea Fish from the Cape (*Lophotes fiski*), based on a specimen sent to the British Museum by the Rev. G. H. R. Fisk.—Mr. Edgar A. Smith, read a report on the Marine Molluscan Fauna of the Island of St. Helena, based principally on a large series of specimens collected by Captain Turton, R.E., and presented to the British Museum.—A second paper by Mr. Edgar A. Smith contained a report on the Marine Mollusca of Ascension Island.

Mathematical Society, April 3.—J. J. Walker, F.R.S., President, in the chair.—The following communications were made:—On the properties of some circles connected with a triangle formed by circular arcs, by Mr. Lachlan.—Some properties of numbers, by Mr. Christie.—The modular equations for $n = 17, 29$, by Mr. R. Russell. Communicated by Prof. Greenhill, F.R.S.

EDINBURGH.

Royal Society, March 17.—Sir W. Thomson, President, in the chair.—The President read a paper on an accidental illustration of the effective ohmic resistance to a transient electric current through an iron bar.—Prof. C. Michie Smith read a paper on the absorption spectra of certain vegetable colouring matters, the most interesting of which was a green colouring matter extracted from the pulp surrounding the seeds *tricosanthes palmata*. This substance is not chlorophyll, but is allied to it.—Prof. Smith also described a method of determining surface tensions by measurement of ripples. Ripples are set up on the surface of the liquid by means of a tuning-fork and the surface is then photographed along with a suitable scale. The lengths of the ripples can thus be obtained by micrometric measurements of the negative. The results obtained for mercury were very concordant, and agreed with the mean value obtained by Quincke. Strong electrification of the surface was found to reduce the value of the surface tension by more than 20 per cent. A few measurements of the surface tension of water also gave very fair results.—The Hon. Lord M'Laren read a paper on the solution of the three-term numerical equation of the nth degree.—The President read a paper, illustrated by a model, on a mechanism for the constitution of ether.

PARIS.

Academy of Sciences, April 8.—M. Duchartre in the chair.—M. Maurice Lévy, in a note on theories of electricity, shows that the formula given in his communication on March 17, representing the action between two moving electric particles, includes all the theories of electricity yet proposed, and that the values of an arbitrary constant required to satisfy each of the known theories are none of them competent to explain the movement of the perihelion of Mercury, whereas the latter is completely in accordance with the formula when another suitable value is chosen for the constant.—M. R. Lépine, in a note on the normal presence in chyle of a ferment destroying sugar, suggests that in the majority of cases of diabetes the disease is probably due to a defect in the production of this necessary body.—Observations of Brooks's comet (a 1890), made with the great equatorial of Bordeaux Observatory, by MM. Rayet, Picart, and Courty. The comet was observed on March 30 and 31, and

April 2 and 3.—Elements and ephemeris of Brooks's comet, by M. E. Viennet. Elements have been computed from observations at Cambridge, U.S., March 21; Kremsmunster, March 26; and Paris, March 31.—Observations of Brooks's comet, made at Paris Observatory, by Mdlle. D. Klumpke.—Fundamental common property of the two kinds of spectra, lines and bands; distinct characteristics of each of the classes; periodic variations to three parameters, by M. H. Deslandres. The facts relating to the periodic recurrence of doubles and triplets in spectra were previously given by M. Rydberg, and reduced to some simple laws (*Comptes rendus*, February 24). It was noted that the lines corresponding to doubles and triplets are represented by a function of whole numbers of the form $N = A - \frac{\alpha}{(m+p)^2}$; where N is the number of waves; A, α, two constants; p a constant less than one, and m a whole number. This function has for a limit the more simple one $N = A - \frac{\alpha}{m^2}$, which, when A and α have proper values, represents exactly, as was shown by Balmer, the unique series of the simple lines of hydrogen. The author states that the distribution of bands is in general more complex, the complete series of groups being represented by a function of three variable parameters, m, n, p — $N = f(n^2p^2) \times m^2 + Bn^2 + \phi(p^2)$; where m, n, and p, are whole numbers; B, a constant; f and ϕ some simple functions the study of which is not completed. N is a function of three parameters, but in certain spectra it is reduced to two or even one. This distribution depending on three parameters is a distinct characteristic of a band spectrum.—On the suppression of halos in photographic plates, by MM. Paul and Prosper Henry. *A propos* of a communication by M. Cornu (*Comptes rendus*, March 17), the authors note that in order to get rid of halos which occur around bright stars on an ordinary photographic plate they cover the backs of plates with collodion containing a small quantity of chrysoidine in solution.—Discharge of the two electricities by the action of ultra-violet light, by M. Edouard Branly. The author has obtained new results by using the induction spark as his source of light in place of the electric arc used by previous observers.—On phosphotrimetatungstic acid and its derived salts, note by M. E. Péchard.—On a nitrosoplatinichloride, by M. M. Vèzes. By the action of an excess of hydrochloric acid on a concentrated solution of potassium platinonitrite, a body is obtained of the composition $PtCl_3(NO),2KCl$, analogous to but much less stable than the nitrosoruthenichloride, $RuCl_3(NO),2KCl$, described by M. Joly (*Comptes rendus*, t. cvii. p. 994). It is distinguished from the platinichloride under the microscope by its form and by its action on polarized light.—Glycollic nitrile and the direct synthesis of glycollic acid, by M. Louis Henry. The nitrile is formed by the addition of formic aldehyde to hydrocyanic acid, $HCOH + HCN = CN{-}CH_2OH$. The glycollic nitrile obtained is a very mobile, odourless, colourless liquid; its density at 12° is 1·100, it boils at 759 mm. pressure at 183° with partial decomposition. By hydrolysis with fuming hydrochloric acid, it yields glycollic acid, which may be separated as the calcium salt. This, in the opinion of the author, is the best method for the preparation of glycollic acid.

STOCKHOLM.

Royal Academy of Sciences, March 13.—On the International Zoological Congress in Paris in 1889, by Prof. F. A. Smitt.—A continuation of the Report of the Ornithological Committee, by Prof. F. A. Smitt.—On the results of the recent winter expedition for hydrographic researches in Skager Rack, by Prof. S. O. Pettersson.—Analytical deduction of the equations of the surfaces and lines which are invariants to the generalized substitution of Poincaré, and some geometrical properties of such invariant surfaces and lines, by F. de Brun.—On a special class of singular surfaces, by T. Fredholm.—On the solution of a system of linear resemblances between an infinite number of unknown quantities, by H. von Koch.—On a paper by H. Weber, entitled "Ein Beitrag zu Poincaré's Theorie der Fuchs'schen Functionen," by G. Cassel.—On the conform representation of a plane on a prism with some correlated problems, by the same.—Researches on mustard-oil-acetic acid and on thiohydantoin, by Prof. Klason.—Derivates of 1 : 3 dichlornaphthalin, by Prof. Cleve.—On the cyclic system of Ribaucour, by Prof. Bäcklund.—Contribution to the knowledge of the Ascomycetæ of Sweden, by C. Starbäck.—Determination of the optical rotation of some resinous derivates, by A. W. Svensson.—Studies on the influence of the irritation of the spinal chord and the nervus splanchnicus on the pressure of the blood with inductions of different frequency and intensity, by J. E. Johansson.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Evolution, Antiquity of Man, Bacteria, &c.: W. Durham (Edinburgh, Black).—Le Premier Etablissement des Néerlandais a Maurice: Prince Roland Bonaparte (Paris).—Le Glacier de l'Aletsch et le Lac de Märjelen: Prince Roland Bonaparte (Paris).—Pocket Meteorological Tables, 4th edition: G. J. Symons (Stanford).—The School Manual of Geology, 5th edition: A. J. Jukes Browne (Edinburgh, Black).—The Two Kinds of Truth: T. E. S. T. (Unwin).—The Art of Paper-making: A. Watt (Lockwood).—Catalogue of Books in the Library of the Indian Museum: R. L. Chapman (Calcutta).—Ueber die Liasischen Brachiopoden des Hierlatz bei Hallstatt: G. Geyer (Wien, Hölder).—Die Liburnische Stufe und deren Grenz-Horizonte, 1 Heft, Erste Abthg.: G. Stache (Wien, Hölder).—Advanced Physiography: J. Thornton (Longmans)—Ferrel's Convectional Theory of Tornadoes; Davis and Curry.—The Root-Knot Disease of the Peach, Orange, and other Plants in Florida (Washington).—The Fossil Butterflies of Florissant: S. H. Scudder (Washington).—The Photographic Quarterly, April (Hazell).—Journal of the Institution of Electrical Engineers, No. 85, vol. xix. (Spon).—Journal of the Chemical Society, April (Gurney and Jackson).—Société d'Encouragement, Paris, Annuaire 1890 (Paris).—Proceedings of the Academy of Natural Sciences, Philadelphia, Part 3, 1889 (Philadelphia).—Insect Life, vol. 2, Nos. 7, 8, 9 (Washington)—Journal of the Bombay Natural History Society, vol. 4, Nos. 3 and 4 (Bombay).—Ergebnisse der meteorologischen Beobachtungen, Jahrg. xi. (Hamburg).—Journal of Anatomy and Physiology, April (Williams and Norgate).—Jahrbuch der k.k. geologischen Reichsanstalt, Jahrg. 1889, 39 Band, 3 und 4 Heft (Wien, Hölder).

CONTENTS.