Colonel Kyd probably, as was the fashion of the day, had a town house in Calcutta. But he appears to have passed a good deal of his time at Shalimar; and in his will he directed that he should be buried in his garden there. The part of the Botanic Garden nearest to Colonel Kyd's house was devoted to the planting of teak trees, in accordance with the Company's earnest desire to supply themselves with timber for ship-building. The experience of thirty-four years having shown that good teak timber cannot be successfully raised on the muddy soil of the Gangetic delta, this part of the garden (extending to about forty acres) was in the year 1820 given up by Government to the Lord Bishop of Calcutta (Dr. Middleton) as the site for a Christian college. The Garden was thus reduced to its present area of 270 acres."

SCIENTIFIC SERIALS.

Bulletin of the New York Mathematical Society, vol. iii. No. 9, June 1894. (New York: Macmillan.)—Prof. E. W. Brown, under the heading "The Lunar Theory" (pp. 207-215). gives an admirable abstract of vol. iii. of Tisserand's "Théorie de Mécanique Céleste, Perturbations des Planètes d'après la Méthode de Hansen; Théorie de la Lune." Herein he opens with the remark: "It is somewhat strange that a subject like the lunar theory, which has received so much attention since its first principles were given by Newton, should be allowed to pass its second centenary before the appearance of a treatise like the present one." His opinion is that, notwithstanding a few defects, the book will take a high rank amongst the many classic treatises on celestial mechanics.—Students of the Theory of Numbers have recently been gratified by the publication (1892) of Bachmann's "Die Elemente der Zahlentheorie." An analysis of its contents, with a brief consideration of the parts which call for special remark, is given by Dr. J. W. A. Young (pp. 215-222).—Prof. Conant (pp. 223-224) calls attention to a work which occupies a unique place among translations, viz. "Memoirs on Infinite Series." These are classic memoirs by Lejeune-Dirichlet (2), Abel, Gauss, and Kummer. The book is brought out, under the auspices of the Tokio Mathematical and Physical Society, by Japanese professors.

IN the numbers of the *Journal of Botany* for June and July, Mr. A. B. Rendle describes new species of Asclepiadeæ and Convolvulaceæ from Tropical Africa, including a new genus of the former order *Odontostelma*, which is also figured.—A new British *Rubus*, *R. Rogersii*, n. sp., is described by Mr. E. F. Linton.—Mr. F. J. Hanbury contributes "A Tentative List of British *Hieracia*," numbering upwards of 100 species.

IN Nos. 5-7 of the *Bullettino della Societa Botanica Italiana* are two papers on fungus diseases of cultivated trees, by Sig. P. Baccarini. The "petecchia" or "vaiolo" (pock) of the orange has been ascribed to various causes. It is always accompanied by a number of fungi, but these are apparently saprophytic, and not pathogenic. The true cause appears to be a bacillus. The "mal nero" of the vine is also attributed to a microbe, *Bacillus vitivorus*, n. sp.—Sig. S. Sommier has two papers on the little-known flora of the Island of Giglio, near to Elba.—Sig. A. Jatta completes his paper on the lichens of Italy, of which he enumerates 1407 species.

THE number of the *Nuovo Giornale Botanico Italiano* for July is occupied by three papers:—"On the Roman Flora," by Sig. A. Terracciano; "On the Flora of Sicily," by Sig. L. Nicotra; and "On the Disease of the Strawberry caused by *Sphærella Fragariæ*," by Sigg. E. Baroni and G. Del Guergio.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 24.—"On the Influence of certain Natural Agents on the Virulence of the Tubercle-Bacillus." By Dr. Arthur Ransome, F.R.S., and Sheridan Delépine.

June 7.—"The Influence of Intra-Venous Injection of Sugar on the Gases of the Blood." By Dr. Vaughan Harley.

In a previous paper (*Roy. Soc. Proc.* 1893), he showed that the intra-venous injection of grape sugar caused an increase in the lactic acid in the circulation. It appeared probable that the lactic acid had combined with the bases of the carbonates in the blood, having driven out the carbonic acid.

Experiments were made on dogs to see what changes were produced in the gases of the blood after intra-venous injections of sugar.

It was found the quantity of carbonic acid was diminished, it being most markedly so during the first hour after the sugar injection, and still somewhat so three to five hours later. These results support the view that the lactic acid drives the carbonic acid from the sodium salts and replaces it.

In the next place, the changes met with in the quantity of oxygen in the blood were investigated. It was found the oxygen was markedly diminished during the first hour after the sugar injection. During the third and fifth hours the quantity in arterial was that usually found in venous blood. The explanation of this cannot up to the present be explained.

June 21.—"Researches on Explosives. Preliminary Note." By Captain Sir A. Noble, K.C.B., F.R.S.

The researches on which I, in conjunction with Sir F. Abel, have been engaged for very many years, have had their scope so altered and extended by the rapid advances which have been made in the science of explosives, that we have been unable to lay before the Society the results of the many hundreds of experiments under varied conditions which I have carried out. We are desirous also of clearing up some difficulties which have presented themselves with certain modern explosives when dealing with high densities and pressures, but the necessary investigations have occupied so much time that I am induced to lay a few of our results before the Society, trusting, however, that before long we may be able to submit a more complete memoir.

A portion of our researches includes investigations into the transformation and ballistic properties of powders varying greatly in composition, but of which potassium nitrate is the chief constituent. In this preliminary note I propose to refer to powders of this description chiefly for purposes of comparison, and shall devote my attention principally to gun-cotton and to those modern explosives of which gun-cotton forms a principal ingredient.

In determining the transformation experienced during explosion, the same arrangements for firing the explosive and collecting the gases was followed as are described in our earlier researches,[1] and the gases themselves were, after being sealed, analysed either under the personal superintendence of Sir. F. Abel, or of Prof. Dewar, and to Prof. Dewar's advice and assistance I am indebted, I can hardly say to what extent.

The heat developed by explosion, and the quantity of permanent gases generated were also determined as described in our researches, but the amount of water formed plays so important a part in the transformation that special means were adopted in order to obtain this product with exactness.

Numerous experiments were made to ascertain the relation of the tension of the various explosives employed, to the gravimetric density of the charge when fired in a close vessel, but I do not propose here to pursue this part of our inquiry, both because the subject is too large to be treated of in a preliminary note and because approximate values have already been published[2] for several of the explosives with which we have experimented.

With certain explosives, the possibility or probability of detonation was very carefully investigated. In some cases the explosive was merely placed in the explosion vessel in close proximity to a charge of mercuric fulminate by which it was fired, but I found that the most satisfactory method of experiment was to place the charge to be experimented with in a small shell packed as tightly as possible, the shell then being placed in a large explosion vessel and fired by means of mercuric fulminate. The tension in the small shell at the moment of fracture and the tension in the large explosion vessel were in each experiment carefully measured.

It may be desirable here to explain that I do not consider the presence of a high pressure with any explosive as necessarily denoting detonation. With both cordite and gun-cotton I have developed enormous pressures, close upon 100 tons per square inch (about 15,000 atmospheres), but the former explosive I have not succeeded in detonating, while gun-cotton can be detonated with the utmost ease. It is obvious that if we suppose a small charge fired in a vessel impervious to heat, the rapidity

[1] *Phil. Trans.* vol. clxv. p. 61.
[2] Noble, "Internal Ballistics," 1892, p. 33; *Roy Soc. Proc.* vol. lii. p. 128.

or slowness of combustion will make no difference in the developed pressure, and that pressure will be the highest of which the explosive is capable, regard being of course had to the density of the charge. I say a small charge, because, if a large charge were in question and explosion took place with extreme rapidity, the nascent gases may give rise to such whirlwinds of pressure, if I may use the term, that any means we may have of registering the tension will show pressures very much higher than would be registered were the gases, at the same temperature, in a state of quiescence. I have had innumerable proofs of this action, but it is evident that in a very small charge the nascent gases will have much less energy than in the case of a large charge occupying a considerable space.

The great increase in the magnitude of the charges fired from modern guns has rendered the question of erosion one of great importance. Few, who have not had actual experience, have any idea how rapidly with very large charges the surface of the bore is removed. Great attention has therefore been paid to this point, both in regard to the erosive power of different explosives and in regard to the capacity of different materials (chiefly different natures of steel) to resist the erosive action.

The method I adopted for this purpose consisted in allowing large charges to escape through a small vent. The amount of the metal removed by the passage of the products of explosion, which amount was determined by calibration, was taken as a measure of the erosive power of the explosive.

Experiments have also been made to determine the rate at which the products of explosion part with their heat to the surrounding envelope, the products of explosion being altogether confined. I shall only briefly allude to these experiments, as, although highly interesting, they have not been carried far enough to entitle me to speak with confidence as to final conclusions.

Turning now to ballistic results. The energies which the new explosives are capable of developing, and the high pressures at which the resulting gases are discharged from the muzzle of the gun, render length of bore of increased importance. With the object of ascertaining with more precision the advantages to be gained by length, the firm to which I belong has experimented with a 6-inch gun of 100 calibres in length. In the particular experiments to which I refer, the velocity and energy generated has not only been measured at the muzzle, but the velocity, and the pressure producing this velocity, have been obtained for every point of the bore, consequently the loss of velocity and energy due to any particular shortening of the bore can be at once deduced.

These results have been obtained by measuring the velocities every round at sixteen points in the bore and at the muzzle. These data enable a velocity curve to be laid down, while from this curve the corresponding pressure curve can be calculated. The maximum chamber pressure obtained by these means is corroborated by simultaneous observations taken with crusher gauges, and the internal ballistics of various explosives have thus been completely determined.

Commencing with gun-cotton, with which a very large number of analyses were made, with the view of determining whether there was any material difference in the decomposition dependent upon the pressure under which it was exploded, two descriptions were employed: one in the form of hank or strand, and the other in the form of compressed pellets. Both natures were approximately of the same composition, of Waltham Abbey manufacture, containing in a dried sample about 4·4 per cent. of soluble cotton and 95·6 per cent. of insoluble. As used, it contained about 2·25 per cent. of moisture.

[Tables were given showing the results of the analyses of the permanent gases.]

From my very numerous experiments on erosion I have arrived at the conclusion that the principal factors determining its amount are: (1) the actual temperature of the products of combustion; (2) the motion of these products. But little erosive effect is produced, even by the most erosive powders, in close vessels, or in those portions of the chambers of guns where the motion of the gas is feeble or *nil*; but the case is widely different where there is rapid motion of the gases at high densities. It is not difficult absolutely to retain without leakage the products of explosions at very high pressures, but if there be any appreciable escape before the gases are cooled they instantly cut a way for themselves with astonishing rapidity, totally destroying the surfaces over or through which they pass. Among all the explosives with which I have experimented I have found that where the heat developed is low the erosive effect is also low.

With ordinary powders, the most erosive with which I am acquainted is that which, on account of other properties, is used for the battering charges of heavy guns: I refer to brown prismatic powder. The erosive effect of cordite, if considered in relation to the energy generated by the two explosives, is very slightly greater than that of brown prismatic, but very much higher effects can, if it be so desired, be obtained with cordite, and, if the highest energy be demanded, the erosion will be proportionally greater. There is, however, one curious and satisfactory peculiarity connected with erosion by cordite. Erosion produced by ordinary gunpowder has the most singular effect on the metal of the gun, eating out large holes and forming long rough grooves, resembling a ploughed field in miniature, and these grooves have, moreover, the unpleasant habit of being very apt to develop into cracks; but with cordite, so far as my experience goes, the erosion is of a very different character. The eddy holes and long grooves are absent, and the erosion appears to consist in a simple washing away of the surface of the steel barrel.

Cordite does not detonate; at least, although I have made far more experiments on detonation with this explosive than with any other, I have never succeeded in detonating it. With an explosive like cordite, capable of developing enormous pressures, it is, of course, easy, if the cordite be finely comminuted, to develop very high tensions, but, as I have already explained, a high pressure does not necessarily imply detonation.

[The velocities and energies developed by the new explosive were shown by the aid of diagrams.]

"The Rotation of the Electric Arc." By Alexander Pelham Trotter.

In the course of experiments made with the view of realising as a practical standard of light, the method of using one square millimetre or other definite area of the crater of the positive carbon of an electric arc,[1] the author has found that the effective luminosity is not as theory would predict,[2] either constant or uniform. By the use of a double Rumford photometer, giving alternating fields, as in a Vernon Harcourt photometer, his attention was called to a bright spot at or near the middle of the crater. The use of rotating sectors accidentally revealed that a periodic phenomenon accompanied the appearance of this bright spot, and although it is more marked with a short humming arc, the author believes that it is always present.

An image of the crater was thrown on a screen by a photographic lens; and a disc having 60 arms and 60 openings of 3°, and rotating at from 100 to 400 revolutions per minute, was placed near the screen. Curious stroboscopic images were observed, indicating a continually varying periodicity seldom higher than 450 per second, most frequently about 100, difficult to distinguish below 50 per second, and becoming with a long arc a mere flicker. The period seemed to correspond with the musical hum of the arc, which generally breaks into a hiss at a note a little beyond 450 per second. The hum is audible in a telephone in the circuit, or in shunt to it. The current was taken from the mains of the Kensington and Knightsbridge Electric Light Company, often late at night, after all the dynamos had been shut down. The carbons were, of course, not cored; six kinds were used.

A rotating disc was arranged near the lens, to allow the beam to pass for about 1/1000th of a second, and to be cut off for about 1/100th of a second. It was then found that a bright patch, occupying about one quarter of the crater, appeared to be rapidly revolving. Examination of the shape of this patch showed that it consisted of the bright spot already mentioned, and of a curved appendage which swept round, sometimes changing the direction of its rotation. This appendage seemed to be approximately equivalent to a quadrant sheared concentrically through 90°. Distinct variations in the luminosity of the crater are probably due to the fact that this is only an approximation.

The *à priori* theory of the constant temperature of the crater is so attractive, that the author is inclined to attribute this phenomenon, not to any actual change of the luminosity of the

[1] J. Swinburne and S. P. Thompson, discussion on paper by the author, "Inst. Electrical Eng.," vol. 21, pp. 384 and 403.

[2] Abney and Festing, *Phil. Trans.* 1881, p. 890; S. P. Thompson, *Soc. Arts. Journ.* vol. 37, p. 332.

crater, or to any wandering of the luminous area, as is seen with a long, unsteady arc, but to the refraction of the light by heated vapour. All experiments, such as enclosing the arc in a small chamber of transparent mica, or the use of magnets, or an air blast, have failed to produce any effect. A distortion of the image of the crater while the patch revolves, has been looked for, but nothing distinguishable from changes of luminosity has been seen.

An unexpected difficulty is thus introduced in the use of the arc as a standard of light, and one which may interfere with its use under some circumstances as a steady and continuous source of light. The author is further examining this phenomenon, with the view of ascertaining its nature, and of finding practical conditions under which it is absent or negligable.

"On the Viscosity of Water as determined by Mr. J. B. Hannay, by means of his Microrheometer." By Robert E. Barnett.

In a paper entitled "On the Microrheometer," published in the *Phil. Trans.* for 1879, Mr. Hannay described an apparatus which he devised for measuring the rate of flow of liquids through a capillary tube, and gave the times of flow of water at various temperatures, and of certain aqueous salt-solutions which he had observed by its means. The capillary was 21 mm. long, and 0·0938 mm. in diameter; the bulb had a capacity of 4·053 c.c., and the pressure employed was that of 1 metre of water at 20°. In order to compare the results with those of other observers, the author has converted the measurements of time of flow recorded by Mr. Hannay for water into viscosity-coefficients by means of the formula :—

$$\eta = \frac{\pi r^4 p t}{8Vl} - \frac{Vp}{8\pi l t}.$$

The figures thus obtained are given in tabular form, and on comparison with the results given by Poiseuille, Slotte, Sprung, and Thorpe and Rodger, are seen to yield discordant values for the viscosity of water. Not only is the value at 0° far below that of any known liquid, but it diminishes so rapidly that at 6° and above it is a *minus* quantity. This paradoxical result is due to the fact that Mr. Hannay's experimental figures are inconsistent. It is physically impossible to pass such a volume of water under the stated pressure through a capillary tube of the dimensions given, in the times recorded. At 20°, for instance, the time of flow required under these conditions would be about 4600 seconds, instead of 131·3 seconds, as stated. The author has attempted in several ways to account for the discrepancy, but without success.

"On the Singular Solutions of Simultaneous Ordinary Differential Equations and the Theory of Congruencies." By Prof. A. C. Dixon.

PARIS.

Academy of Sciences, July 16.—M. Lœwy in the chair.—New researches on chromium, by M. Henri Moissan. Chromium has been prepared in large quantity by means of the electric furnace. Pure chromium has the density 6·92 at 20° C. It is more infusible than platinum, and has, apparently, no action on a magnetic needle. It is practically unacted on in moist air, but burns at 2000° C. in oxygen. It readily combines with silicon and carbon, to form very hard compounds; the silicide scratches the ruby. The pure metal is not nearly so hard, and readily takes a fine polish. It is hardly attacked by acids, resisting aqua regia, and is not acted on by fused potash, though oxidised by fused potassium nitrate or chlorate.—On the two ourang-outangs which have recently died at Paris, by M. A. Milne-Edwards.—On the mechanism of the murmurings caused by the passage of air in tubes; determination of the moment when a soundless flow, transformed instantaneously into a murmuring flow, becomes sonorous in the different points of the tube, by M. A. Chauveau.—On the necessity for ostriches, and most birds, to swallow hard bodies which remain in the pyloric region of the stomach, and which play the part, as regards foods, of masticatory organs, by M. C. Sappey.—On dimethylamidobenzoylbenzoic acid, diethylamidobenzoylbenzoic acid, and dimethylanilinephthalein, by MM. A. Haller and A. Guyot.—Note on some biological variations of *Pneumobacillus liquefaciens bovis*, the microbe of contagious peripneumonia of cattle, by M. S. Arloing. The author describes a non-liquefying variety of this microbe, and shows that it is not an independent species.—Studies on central actions: general laws relative to the effect of media, by M. F. P. Le Roux.—On interferences due to mean difference of path, by M. Georges Meslin.—Direct autographic record of the form of periodic currents by means of the electrochemical method, by M. P. Janet. A battery of fifteen steel styles, connected with fifteen points of the circuit taken, so that the difference of potential between consecutive points was about four volts, gave traces on prepared paper which indicated the characteristics of the discharge through the circuit.—Coefficient of self-induction of n equal and equidistant parallel threads of which the sections are distributed on a circumference, by M. Ch. Eug. Guye. The coefficients calculated for two selected definite systems by means of a formula quoted agree with the experimental values within about one per cent.—On the equation of discharges, by M. R. Swyngedauw.—Separation and estimation of tin and antimony in an alloy, by M. Mengin. The oxides are obtained as usual by means of nitric acid acting on the alloy of tin and antimony, and the metal antimony is reduced therefrom by means of a plate of pure tin and hydrochloric acid, and weighed separately.—On rotatory powers variable with the temperature; a reply to M. Colson, by M. A. Le Bel.—Synthesis of mesoxalic acid and bismuth mesoxalate, by M. H. Causse. The acid has been obtained by oxidation of glycerine by means of nitric acid in presence of bismuth nitrate. Insoluble bismuth mesoxalate is formed and, by virtue of its insolubility, the mesoxalic acid is removed from the field of action and escapes further oxidation.—Contribution to the study of some amido-acids obtained by the condensation of vegetable proteid substances, by M. E. Fleurent. On some derivatives of the propylamines, by M. F. Chancel. The preparation and properties are described of the compounds (1) propylpropylideneamine, (2) monopropylacetamide, (3) dipropylacetamide, and (4) tetrapropylurea.—On some points in the anatomy of the ourang-outang, by MM. J. Deniker and R. Boulart.—On the male genital apparatus of the ourang-outang (*Simia satyrus*, L.), by M. E. de Pousargues.—On the osteology of the ourang-outang, by M. P. Delisle.—Researches on the excitability of rigid muscles and on the causes of the disappearance of cadaveric rigidity, by M. J. Tissot. The author shows that the relaxation of the cadaveric rigidity of muscles is not due to putrefaction, which only sets in after the rigidity disappears.—Physiological mechanism of egg-laying among Orthopterous insects of the family of the Acridii. The *rôle* of the air as a mechanical agent, and multiple functions of the genital apparatus, by M. J. Kunckel d'Herculais.—Conditions of the development of *Rougeot* (*Exobasidium vitis*) on the leaves of the vine, by M. Albert Renault.—On a parasite of the vine, *Aureobasidium vitis*, by MM. P. Viala and G. Boyer.—On the carved ivories from the Quaternary station of Brassempouy (Landes), by MM. Ed. Piette and J. de Laporterie. An account of five statuettes or parts of statuettes of human figures, found among cinders and numerous bones of the rhinoceros, mammoth, aurochs, horse, and hyæna.—On the Constantinople earthquake. An extract from a letter from M. Moureaux to M. Mascart.

AMSTERDAM.

Royal Academy of Sciences, June 30.—Prof. van der Waals in the chair.—Prof. Behrens, Delft, gave some particulars concerning the detection of alkaloids by microchemical methods. A good method must give slides, showing the alkaloids pure or well crystallised combinations, from which the pure alkaloid can be set free by simple and trustworthy reactions. Such slides can be kept any time as documents for comparing with standard slides and further experiments, while the colour-tests in current use generally destroy the alkaloid. Volatile alkaloids are the most easy to isolate. Thus, from 0·3 mgr. of tea, and from 1 mgr. of coffee, by extraction with lime water and with alcohol, and subsequent sublimation, characteristic needles of theine were obtained without any difficulty. Cocoa must be extracted with weak acetic acid. After purifying with acetate of lead and concentrating, the liquid is dried with an excess of sodium carbonate, and sublimed at 300° C. Powdery theobromine is obtained, giving characteristic prisms with silver nitrate, and, later on, needles, resembling theine, more volatile than theobromine and more soluble in water. Their angle of extinction is 0°, and their chloromercurate is easily soluble. For theine, angle of extinction 45°, chloromercurate thrown down as long needles.

Two mgr. of cocoa are sufficient for showing both alkaloids. Among alkaloids that are not volatile, quinine may be cited, treated with success by the author six months ago. As another example, strychnine and brucine may be taken. For tracing strychnine the limit was found by de Vry and van der Burg at 0·001 mgr. With the aid of microchemical methods, well-defined crystals of strychnine can be obtained down to 0·0002 mgr. in the presence of as much brucine; afterwards the latter is made to crystallise as chloroplatinate. The actual limit is found at a fourth of this quantity. A detailed paper will be published next year.—Mr. Bakhuis Roozeboom discussed the graphical representation of heterogeneous equilibrium in systems of one to four substances. For systems of one substance we have only p, t lines which encounter each other in triple points. Systems of two substances may be represented in space between two parallel plans, by points which indicate p, t and the composition. For systems of three components the composition may be expressed in an equilateral triangle, and in a direction perpendicular to this plan, either p, or t. For systems of four substances the composition only can be expressed for one single temperature and pressure by points in a tetrahedron. The author discussed the conditions for a right selection of the components, and demonstrated that, in systems which admit single or double substitution, the number of components is one inferior to that of the apparent components.—Prof. J. A. C. Oudemans presented a note on the geographical position of the Astronomical Observatory at Utrecht, revised by him on a request from the editor of the British Nautical Almanac. The latitude = 52° 5′ 9″·5. Using Leiden-Greenwich, as newly found by telegraph, and Utrecht-Leiden, geodetically determined, he deduced 20m. 31s.·00, practically the same result as given by the old observations of Hennert, van Utenhove, Wagner, van Beeck, Calkoen, and Keyzer, from 1778 to 1820.—Prof. C. A. J. A. Oudemans exhibited two new fungi, viz. *Septoria dictyotæ*, found on *Dictyota obtusangula*, a submerged *Rhodophycee*, detected by Miss Weber in the neighbourhood of Malacca, and *Ustilago Vuyckii*, discovered by Mr. Vuyck, in Leiden, in the ovary of *Luzula campestris*.—Prof. Kamerlingh Onnes commented on (1) the coefficients of viscosity of fluids in corresponding states, calculated by Mr. de Haas. They generally agree with the formula deduced from his theorem that the moving molecular systems in corresponding states are mechanically similar. Great deviations are shown by the fatty acids, and especially the alcohols. (2) The further experiments made by Dr. Kuenen, in the Leiden Laboratory, on the abnormal phenomena observed by Galitzine near the critical point. Dr. Kuenen proved that they are to be ascribed to impurities, and in particular to air. Gas can be originated at one side of the tube by heating a part of it, just as during the process of sealing. The gas being transferred to the opposite side of the tube, the density at this side changes in accordance. By admitting air at one side, anomalies such as were observed by Galitzine are obtained.—Mr. Jan de Vries presented an article on triple equations. He showed that the roots of such equations of degrees 7 and 9 cannot satisfy a symmetrical trilinear relation. This property is also verified for two distinct sorts of triple equations of degree 13; it has not yet been decided whether these are the only possible systems of this degree.

NETHERLANDS.

Entomological Society, June 9.—Mr. A. van den Brandt in the chair.—Mr. Everts exhibited a fine collection of specimens illustrating the biology of the honey-bee; Mr. Leesberg, specimens of the rare *Dorcatoma chrysomelina*, new for the Dutch fauna; Mr. Snellen, both sexes of *Euplœa martinii* de Nicéville, and a bread specimen of *Meliana flammea*, Curt.; Mr. J. C. H. de Meyere, several rare and interesting indigenous Diptera; Mr. F. J. M. Heylaerts, specimens of *Coleophora* and *Psychidæ*; Mr. H. A. de Vos tot Nederveen Cappel, *Agrotis dahlii*, *Boarmia abietaria*, and a very curious variety of *Tæniocampa incerta*; Mr. A. J. F. Fokker, specimens of two rare indigenous Hemiptera, *Eurygaster maura* and *hottentotta*. The latter stated that the name of *Podops horvathi*, a species which was not long ago described by him in the Dutch *Tijdschrift*, had been previously given by Distant to a Japanese species, and was therefore changed by Dr. Bergroth into *P. subalpina*. —Mr. H. J. Veth described the liquids emitted by the coxæ of several Coleoptera (Coccinellidæ and others), and which, according to Leydig, was a secretion of blood. A renewed chemical inquiry into its nature, however, seems to be desirable.—Mr. A. J. van Rossum gave a further account of his breedings of *Cimbex fagi* and *saliceti*.—Mr. J. Th. Oudemans exhibited an apparatus for setting Lepidoptera, and adapted to be used during long journeys.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—Observations and Researches made at the Hongkong Observatory in 1893: W. Doberck (Hongkong).—Twelfth Annual Report of the Fishery Board for Scotland; Part 1, General Report (Edinburgh).—Total Eclipses of the Sun: M. L. Todd (Low).—The First Technical College: Prof. A. H. Sexton (Chapman).—Agricultural Zoology: Dr. J. R. Bos, translated by Prof. J. R. A. Davis (Chapman).—Royal Natural History, Part 9 (Warne).—Primary Geography: A. E. Frye (Boston, Ginn).—Arithmetic for Schools: Rev. J. B. Lock, new edition (Macmillan).—A Laboratory Manual of Physics and Applied Electricity, 2 Vols.; Vol. 1, Junior Course in General Physics: E. Merritt and F. J. Rogers (Macmillan).—Organic Chemistry, Part 1: Prof. Perken and Dr. Kipping (Chambers).—Histoire du Monde son Évolution et sa Civilisation: É. Guyard (Paris, L'Auteur).—Knowledge through the Eye: A. P. Wire and G. Day (Philip).

PAMPHLETS.—Researches in the Nervous System of Myxine Glutinosa: R. Sanders (Williams and Norgate).—Ueber die Geometrischen Eigenschaften homogener starrer Structuren und ihre Anwendung auf Krystalle: W. Barlow (Leipzig, Engelmann).—The Growth of St. Louis Children: W. T. Porter (St. Louis).

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