At Carlton College, Northfield, Minn., it was estimated that four observers might have counted about 1600 meteors per hour. There was a marked falling off in numbers on the morning of November 16. Yet at two stations, according to newspaper reports, the shower was quite striking on the latter morning, for at Los Angeles one observer is said to have counted 385 meteors in the hour between 4h. and 5h. a.m., while at Phœnix 200 were seen in half an hour. It is highly probable, however, judging from the character of the shower as recorded at other stations, that in the two latter cases the observations were really made on the morning of the 15th and not on the 16th as stated in the newspaper accounts, which are often erroneous in such matters.

The maximum of the display must have occurred at about 11h. 30m. a.m. G.M.T. November 15, according to some of the best American descriptions. Possibly it may have been attained even later than this, for the morning twilight must have affected the observations to some extent. If the time of greatest frequency was after that stated, the phenomenon at its best could only have been observed from the Pacific Ocean, and it is not probable that we shall get any satisfactory reports from this region.

Though the shower was pretty active, it does not appear that photography has afforded any material assistance in recording its features. Plates were exposed at many observatories, but trails were absent upon them except in one or two isolated instances.

In England a number of meteors were doubly observed during the Leonid epoch, and their real paths have been calculated. In the following table are given the heights, &c., of 8 Leonids, of 1 Leo Minorid, of 1 δ Leonid, and of a remarkably slow-moving meteor from Cetus :—

Date. 1901.	G.M.T. h. m.	Mag.	Height at beginning. Miles	Height at ending. Miles.	Path. Miles.	Velocity per second. Miles.	Radiant point. α	δ
							°	°
Nov. 14	13 32	1→>1	85	52	66	Rapid	156	+32
	13 37½	2 — 1	77	57	38	Rapid	152	+30
	13 42	2½ — 9	81	67	67	55	174	+20
	14 24	4 — 2	82	57	44	Rapid	152	+25
	14 38	2 — 2	67	54	22	37	152	+23
	15 7	3 — 1	95	55	60	Rapid	152	+23
	15 23	>1 — 2½	72	47	36	72	151	+25
	16 0	1→>1	91	61	41	54	149	+20
	16 7	1	86	60	35	Rapid	151	+23
Nov. 15	13 8	1½— 1	43	37	28½	7¾	38	−21
	13 48	2 — 2½	76	59	37	37	151	+21

The mean height of 8 true Leonids was 81 to 56 miles and the mean radiant-position 151°·2 + 23°·7.

The place of the radiant found by Mr. Winslow Upton at the Ladd Observatory, Providence, was on November 15 a.m. 150¾° + 21½°, and on November 16 a.m. 151° + 21¼°.

The next return of the Leonids will be regarded in an interesting light, for 1902 will afford the 1000th anniversary of the first record of the shower (902). The moon will be full at the middle of November, but as the meteors of this swarm are often brilliant, some of them are likely to be distinguished in spite of the illuminated sky. There were showers of Leonids in 902, 1002, 1202 and 1602, and the revival of the display in 1901 encourages the hope that something may be seen of it in 1902, though the parent comet will be about three and a half years past its perihelion. W. F. DENNING.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The 231st meeting of the Junior Scientific Club was held on January 31. Two papers were read, one by Prof. H. A. Miers, F.R.S., Magdalen, on gold-mining in Klondike, and the other, by Mr. H. L. Tidy, New College, on some curious sounds. The officers of the Club for this term are :—President, Mr. H. H. Cooke, New College ; biological secretary, Mr. E. Burstal, Trinity ; chemical secretary, Mr. S. P. Grundy, Balliol ; treasurer, Mr. E. L. Kennaway, New College ; editor, Mr. H. D. Davis, Balliol.

IN reply to a question in the House of Commons on Monday as to the approximate date of the introduction of the Education Bill promised in the King's Speech, Mr. Balfour said he was unable to give a date, but he hoped the Bill would be introduced before Whitsuntide.

CORRESPONDENCE classes in various branches of engineering have been successfully carried on in the United States for several years. Prof. Andrew Jamieson, late professor of electrical engineering at the Glasgow Technical College, has now established similar classes in Glasgow for students of electrical and machanical engineering. We are glad to notice that all students are advised to take a course of practical mathematics before devoting themselves to other subjects.

THE annual general meeting of the Association of Technical Institutions was held on Friday last in London. Lord Avebury, the president for the ensuing year, delivered an address in which he showed that the system of technical and higher education in Germany had been to the industrial advantage of the nation. If Britannia is to rule the waves she must be able to rule the steam engine and dynamo as well. Resolutions were adopted to the following effect :—(*a*) That this Association strongly approves the general principles on which the Government Education Bill of 1901 was based, and trusts that the Government will carry a Bill embodying these principles, with such amendments as may prove necessary, in the next session of Parliament. (*b*) That the Bill should prescribe that the residue under section 1 of the Local Taxation Account (Customs and Excise) Act, 1890, including any balance thereof which may remain unexpended at the end of the financial year, shall be applied for the purposes of education, and shall be administered by the education authority. (*c*) That an extension of the rating power by only 1d. in the pound, as was proposed in the Bill of 1901, would be wholly inadequate—especially in the case of the county boroughs—to defray the necessary additional charges in respect of secondary education which would fall upon the local authorities. (*d*) That it should be made a condition of the application of the residue under section 1 of the Local Taxation (Customs and Excise) Act, 1890, to the purposes of secondary education in general, that adequate provision shall first have been made for technical instruction, as was done in clauses one (1) and two (1) of the Duke of Devonshire's Education Bill of 1900. (*e*) That the Government should at once introduce and pass a Bill placing primary, secondary and technological education under the supervision of one local authority appointed as a rule for an area not less than that of a county or a county borough.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 23.—"On the Causation of the so-called 'Peripheral Reflex Secretion' of the Pancreas. (Preliminary Communication.)" By W. M. Bayliss, D.Sc. and Ernest H. Starling, M.D., F.R.S.

Introduction.—It has long been known that the introduction of acid into the duodenum causes a flow of pancreatic juice, and it has been shown recently by Popielski, and by Wertheimer and Le Page, that this flow still occurs after nervous isolation of duodenum and pancreas. Wertheimer also mentions that the flow can be excited by injection of acid into the jejunum, but not by introduction of acid into the lower part of the ileum. These authors conclude that the secretion is a local reflex, the centres being situated in the scattered ganglia of the pancreas, or, in the case of the jejunum, in the ganglia of the solar plexus (Wertheimer).

Results.—The secretion excited by introduction of acid into the jejunum cannot be reflex, since it occurs after extirpation of the solar plexus and destruction of all the nervous filaments passing to the isolated loop of jejunum. It also occurs after intravenous injection of 0·01 gramme atropin sulphate. It must therefore be due to direct excitation of the gland cells be a substance or substances conveyed to the gland from the bowel by the blood stream.

The exciting substance is not acid. Wertheimer has shown that injection of 0·4 per cent. HCl into the blood stream has no excitatory influence on the pancreas.

The secretion must therefore be due to some substance produced in the intestinal mucous membrane under the influence of the acid, and carried thence by the blood stream to the gland. This conclusion was at once confirmed by experiment.

When the mucous membrane of the jejunum or duodenum is exposed to the action of 0·4 per cent. HCl a body is produced which, when injected in minimal doses into the blood stream,

produces a copious secretion of pancreatic juice. This body, which for the present is termed *secretin*, is associated with another body with a pronounced lowering effect on the blood pressure. The two bodies are not identical, since acid extracts of the lower end of the ileum produce the pressure-lowering effect, but have no excitatory influence on the pancreas.

Observations indicate that *secretin* is probably a body of very definite composition, and of small molecular weight. Dr. Osborne is at present engaged in an investigation of its chemical characters and identity.

"On the Excretory Organs of Amphioxus." By Edwin S. Goodrich, M.A., Fellow of Merton College, Oxford. Communicated by E. Ray Lankester, F.R.S.

Linnean Society, January 16.—Prof. S. H. Vines, F.R.S., president, in the chair.—Mr. Alfred O. Walker exhibited some branches of cherry affected with a fungus disease caused by *Gnomonia erythrostoma*.—Mr. J. E. Harting exhibited some heads of wild sheep, together with photographs and lantern-slides, to illustrate a recent suggestion as to the use and value of spiral horns in feral species. Dr. George Wherry, of Cambridge, who originated the discussion and was present as a visitor, selected *Ovis nivicola* of Kamtschatka as a typical species to support his theory, and pointed out that while the horns were enormous, the ear was remarkably short, situated exactly in the axis of the spiral, and, as it were, at the apex of a hollow cone formed by the great spiral horn. This he regarded as a provision of Nature to enable the animal to hear better and to determine the direction of sounds when there is a mist or fog, the horn acting like an Admiralty megaphone when used as an ear-trumpet. Mr. Harting pointed out that the remarkably large spiral horns were peculiar to the male sex, and that if they were to be regarded as of use for the preservation of the species, the ewes, which required the most protection, would be in that respect defenceless. This would be especially the case with *Ovis nivicola*, the sexes of which, according to Dr. Guillemard ("Voyage of the *Marchesa*," vol. i. p. 214), lived apart in small herds for some portion of the year. It was a significant fact, also, that wild sheep, like other wild animals, posted sentries whilst feeding to prevent being surprised by their enemies, and it was the experience of those who hunted them that when approached the alarm was generally given by a ewe. He thought that wild sheep and goats, like deer, relied more upon their sense of sight and smell than upon their hearing, and that the large horns, like those of other ruminants, were simply weapons of defence against wild carnivora, and of offence against rivals during the breeding-season, as in the case of deer. Dr. Wherry, in reply, thought it would be found, in the case of ewes in which the horns were either absent or rudimentary, that the ears, by way of compensation, were much larger than those of the rams; but he had been unable to find anywhere a head of a female *Ovis nivicola* for examination.—Messrs. H. and J. Groves read a paper on the use of Linnean specific names. They showed that great diversity of practice existed in dealing with these names, and pointed out the necessity of arriving at some agreement as to their use as a first step towards uniformity in nomenclature. They grouped the Linnean specific names under the following heads:—(1) Those applied to distinct species fairly well understood in Linnæus's time, and still generally accepted. (2) Those which are now considered to include two or more species, combined by Linnæus owing to either (*a*) the imperfect knowledge of the plants at the time, or (*b*) the different ideas then and now as to the extent of species. (3) Those about which there is more or less doubt as to their proper application, owing to (*a*) the descriptions being imperfect, (*b*) the synonymy (often the most important part of the description) being contradictory, or (*c*) confusion due to changes made by Linnæus himself after publication. After discussing the various methods adopted and the difficulties connected with each, Messrs. Groves recommended that in doubtful cases, so far as possible, the description in conjunction with the reference to earlier authors should be relied on, always construing the species liberally, and that when the specimens in the Linnean herbarium or amendments in the second edition of "Species Plantarum" are at variance with this conception of the species, they should be disregarded. As regards group 2, they recommended that the name should be retained for the type if specified, or if not to the species which may be most fairly regarded as the type, and in the absence of such to the residuary species after others had been cut off; and as regards group 3, that unless the evidence is hopelessly vague, or contradictory, the names should be retained for the species for which the weight of evidence points to their having been intended. Specimens were exhibited of the plants which, following the practice advocated, would stand as *Hypericum quadrangulum*, L., *Epilobium alpinum* and *E. tetragonum*, L., and *Sparganium erectum*, L., also of the allied species in each case bearing on the question.

CAMBRIDGE.

Philosophical Society, January 20.—Prof. Macalister, president, in the chair.—On the question of "predisposition" and "immunity" in plants, by Prof. H. Marshall Ward, F.R.S. The author directed attention to previous work by himself and others which indicates that plants are not merely passive to the attacks of parasites, and especially referred to experiments with the rust fungi (Uredineæ) which clearly show that not only do these parasites vary and differ in their powers of adaptation to different hosts of the same species or genus, but the hosts exert definite reactions on the fungi. In particular, the results of a large series of infection experiments made by the author with the uredo of *Puccinia dispersa*, the brown rust of the bromes, were summarised. During the past summer more than 1800 such experimental infections were made on twenty-two varieties and species of Bromus, belonging to four out of the five subgenera. The infecting spores were derived from three different species of Bromus. The results show distinctly that not only does the power of the fungus to attack a given species of the flowering plant depend on the specific nature of the latter, but it also depends on the specific nature of the previous host on which the spores were produced. The conclusion is arrived at that specific predisposition and immunity in plants depend on similar internal mechanisms and conditions to those which determine the possibility or otherwise of cross-fertilisation, and just as this possibility varies and may be increased or diminished by inheritance in breeding, so may the capacity of resistance to infection vary and be increased or diminished in different races. It is probable that secretions of enzymes, chemotactic substances, toxins and antitoxins in the cell play a part in all such processes.—On the genito-urinary organs of dipnoan fishes, by Mr. Graham Kerr.—Further observations on the biological test for blood, by Mr. George H. F. Nuttall. The paper refers to studies of what the author terms "blood-relationship" amongst animals by means of test-tube reactions with various anti-sera. The results of the investigation of some 440 species of blood go to show that the biological test for blood may possess considerable value in relation to zoological study.

MANCHESTER.

Literary and Philosophical Society, January 21.—Mr. Charles Bailey, president, in the chair.—Mr. W. E. Hoyle made some remarks on a case of failure of concrete flooring strengthened by steel bands.—A paper, entitled "On *Xenophyton radiculosum* (Hick), and on a stigmarian rootlet probably related to *Lepidophloios fuliginosus* (Williamson)," was read by Prof. F. E. Weiss. He gave his reasons for regarding the fossil Xenophyton, described by the late Thomas Hick in 1891, as a stigmarian "root" or rhizome, which, on account of the peculiar structure of its vascular cylinder and of its massive and well-preserved middle cortex, he considered to be closely allied to the lepidodendroid stem known as *Lepidophloios fuliginosus*. He also described a stigmarian rootlet, which he considered to be related to Lepidophloios. This rootlet was further remarkable on account of the presence, in its well-preserved cortex, of a vascular branch similar to that described for stigmarian rootlets of a different type by Renault. Prof. Weiss stated that he had been able to confirm the occurrence of such branches from the central cylinder in several other stigmarian rootlets, in the collection of the Manchester Museum.

EDINBURGH.

Royal Society, December 16, 1901.—Prof. Geikie in the chair.—Dr. T. J. Jehu read a paper on a bathymetrical and geological study of the lakes of Snowdonia and eastern Carnarvonshire. It was clearly demonstrated that ice action had been an important factor in the formation of many of the valleys and lakes of the district, although at the same time it was also evident that other geological agents had been at work. The comparatively great depth of certain of the lakes, of which

sixteen had been studied in detail, left no doubt as to their glacial origin.

January 6.—Sir W. Turner in the chair.—A paper by Mr. F. Fraser, on a theoretical representation leading to general suggestions on the ultimate constitution of matter and ether, was communicated by Prof. Chrystal. The fundamental novelty was the conception of an atom of matter as a kind of ether bubble. The ether was supposed to be an assemblage of rapidly moving corpuscles rebounding after collision without loss of energy, and in this a spherical vacuity was produced forming the atom, the corpuscles in the spherical surface being kept circulating in the surface by the impacts of the corpuscles from outside, which on their part were unable to penetrate within the sphere because of the barrier of swiftly moving corpuscles in the surface. The author believed that this hypothesis gave the gravitation law of attraction between two neighbouring bubbles. The paper also contained speculations relating to valency in chemistry.—A paper was read by Dr. D. H. Scott on the primary structure of certain Palæozoic stems with the dadoxylon type of wood. The principal result of the investigation, as a whole, was to show that in a number of stems of Palæozoic age with secondary wood of the well-known dadoxylon type there were around the pith distinct usually mesarch strands of primary xylem, forming the downward continuation of the leaf-trace bundles. Hence, the anatomical structure typically represented by *Lyginodendron Oldhamii* proves to have been widely distributed among Palæozoic plants, and to have been common to stems which on other grounds would be reasonably referred to Cordaiteæ. Thus new links have been found connecting this gymnospermous family with the Cycadofilices, and through them with some primæval group of ferns.—Dr. Thomas Muir communicated a paper on a continuant resolvable into rational factors, and a note on selected combinations.—Dr. Hugh Marshall read a note on a suggested modification of the sign of equality in chemical notation, in which he proposed that in chemical equations representing actions which actually occur the sign of equality should be composed of singly barbed arrows arranged so as to differentiate the most important varieties of chemical action. The symbols suggested were : $\rightleftharpoons$, $\rightleftharpoons$, $\rightleftharpoons$, $\rightleftharpoons$, the first for irreversible actions, the second for reversible actions, such as dissociation, &c., the third for reversible actions with definite transition point (in which case the temperature might be stated above the symbol), and the fourth for reversible actions which, under the conditions of the experiment, are practically completed in the direction indicated, so that the reversible character of the action is not of immediate importance. It might also be used in doubtful cases.

PARIS.

Academy of Sciences, January 27.—M. Bouquet de la Grye in the chair.—An apparatus for measuring the variations of small zenithal distances, by M. G. Lippmann. The apparatus described makes the zenith visible in the field of observation as a small artificial star, which shows amongst the real stars. It possesses the advantages of requiring no special regulation or stability, and visual observations may be replaced by photography.—On some properties of the radiation from radioactive bodies, by M. Henri Becquerel. It has been shown in earlier papers that radium rays are divided into two groups in a strong magnetic field, one part being not affected and giving a strong impression on a photographic plate, the other being deviated in a manner similar to the kathode rays. No portion of the polonium rays is deviable. An analogous experiment has now been made with uranium. The times of exposure were necessarily very long, twenty and forty-two days in two experiments. The whole of the uranium rays appear to be deviated, the non-deviable portion, if it exists, being of an intensity which is negligibly small compared to the whole radiation. This would appear to show a fundamental difference between uranium and radium. It has been previously found that the dark radiation from radium is capable of transforming white into red phosphorus, and analogous experiments with uranium showed that the uranium rays possess the same property.—On the preparation of tantalum in the electric furnace and on its properties, by M. Henri Moissan. An alloy of niobium and tantalum was first prepared by reducing niobite with sugar charcoal in the electric furnace ; this was then converted into fluotantalate and fluoniobate of potassium, and these salts separated by Marignac's method. The tantalic acid prepared in this way was then reduced with charcoal in the electric furnace in a graphite crucible. Metallic tantalum was thus obtained containing only a small quantity of carbon as impurity, as a brilliant metallic mass, with a crystalline fracture, of density 12·79. Its behaviour towards various chemical reagents is given in detail.—On a class of rational transformations, by M. Ivar Fredholm.—On the resolution of singular points of algebraic surfaces, by M. Beppo Levi.—The experimental definition of the different kinds of X-rays by radiochromometry, by M. L. Benoist. The unequal variations of transparency of two different bodies is utilised, when the quality of the X-rays changes, to define a series of qualities of rays, by a series of relative transparencies, for example, of aluminium with respect to silver. The scale of rays thus constituted is always comparable to itself, when the two bodies and their thicknesses are defined.—On an apparatus for automatically registering discharges in the atmosphere, by M. J. Fényi. A coherer and a bobbin are inserted in the circuit of a Meidinger cell. A magnetised needle is placed in the centre of the bobbin, and this is deviated and closes the registering circuit when the coherer becomes conducting owing to a discharge.—On the vapour pressures of hydrogen selenide and the dissociation of its hydrate, by MM. de Forcrand and Fonzes-Diacon. The vapour pressures were measured at four points, −42°, −30, 0°·2 and 30°·8, and from these a curve was constructed. From this the heat of vaporisation was calculated by means of the Clapyron formula. A similar set of determinations was made for the hydrate.—On lithium antimonide and on the preparation of some alloys of lithium, by M. P. Lebeau. Lithium and antimony readily combine, giving rise to a large development of heat, but the violence of the reaction is so great that a definite compound could not be obtained in this way. But the electrolysis of a mixture of the chlorides of lithium and potassium with a kathode of antimony readily gives a definite crystallised antimonide of the formula $SbLi_3$. The same method can be applied to the preparation of a certain number of other alloys of lithium.—The action of copper hydrate on aqueous solutions of metallic salts, by M. A. Mailhe.—Contribution to the study of the aluminium-iron and aluminium-manganese alloys, by M. Léon Guillet.—On glyceroarsenic acid, by M. V. Auger. Arsenic acid and glycerol readily react, producing acid esters with the elimination of one or two molecules of water, but the product obtained is immediately hydrolysed on contact with cold water.—On the assimilation of lactic acid and of glycerol by *Eurotyopsis Gayoni*, by M. P. Mazé.—On the modifications of the segmentary organs of Syllis, and their functions, at the stage of reproduction, by M. G. Pruvot.—On the mechanism of the formation of the purple of molluscs, by M. Raphael Dubois. The production of the colour would appear to be due to two substances, one of which is a macrozymase, to which the name of purpurase is given. The action of light is necessary to the production of the purple.—On the physiological effects of the poison of the filaments and tentacles of the Cœlenterata, by MM. P. Portier and Charles Richet.—The apolar and closed divergent chains in ferns, by MM. C. Eg. Bertrand and F. Cornaille.—On the withering of vines caused by *Coepophagus echinopus*, by MM. L. Mangin and P. Viala.—The study of the daily variations of the meteorological elements in the atmosphere, by M. L. Teisserenc de Bort.—On the origin and age of the spring of Vaucluse, by M. E. A. Martel.

NEW SOUTH WALES.

Royal Society, December 4, 1901.—Prof. T. W. E. David, F.R.S., vice-president, in the chair.—The gums, resins and other vegetable exudations of Australia, by Mr. J. H. Maiden. The author gives a list of natural orders which in Australia yield both gums and resins, classifying them according as the gum or resin is the predominating substance. The paper contains a tentative list of those orders which yield kinos, and a list is given of those exudations which specially merit the attention of the research chemist. Then follows the main portion of the paper, which contains notes on all the exudations known to the author, arranged in botanical sequence.—On the principle of continuity in the generation of geometrical figures in homaloidal space of n-dimensions, by Mr. G. H. Knibbs. The author discussed the philosophical basis of the idea of the continuous generation of geometrical figures, and showed that we are compelled to admit the conceptional existence of a space of different orders, as well as dimensions, of infinity and zero, the interpretation of such being in all cases unambiguous.—Some theorems, concerning geometrical figures in space n dimensions, whose $(n-1)$ dimensional generatrices are n^{ic} functions of their position

on an axis, straight, curved, or tortuous, by Mr. G. H. Knibbs. In this paper the author showed that certain theorems developed in two previous papers might be extended greatly in generality, and were applicable to *quanta* determinations in *n*-dimensional space.—Rock-holes used by the aborigines for warming water, by Mr. R. H. Mathews. The author showed that the natives were in the habit of immersing heated stones in small quantities of water for the purpose of warming it for drinking, and in some cases to assist in cooking their food.—Some aboriginal tribes of Western Australia, by Mr. R. H. Mathews. Mr. Mathews also contributed an article on some aboriginal tribes of Western Australia, describing their divisions into intermarrying sections; lists of totems, comprising animals, plants and other natural objects, attached to each of the sections, were also given. The laws regulating marriage and descent were explained, together with a brief outline of the structure of the language. Mention was made of their legends, knowledge of the cardinal points, and customs of genital mutilation, the whole concluding with a comprehensive vocabulary.—Projects for water conservation, irrigation and drainage in New South Wales, by Mr. H. G. McKinney.

ST. LOUIS.

Academy of Science, January 6.—Mr. Henry W. Eliot, president, in the chair.—On behalf of herself and a considerable number of other persons, Mrs. William Bouton presented to the Academy a collection of 633 butterflies mounted on Denton tablets, on condition that the collection should be made accessible to the public. The following papers were presented by title:—New species of plants from Missouri, by Messrs. K. K. Mackenzie and B. F. Bush.—Revision of the North American species of Triodia, by Mr. B. F. Bush.—Prof. A. S. Chessin exhibited a gyroscope and explained how an accurately constructed and rapidly rotated gyroscope might be made to indicate the position of the meridian plane, the direction of the polar axis of the earth and the latitude of the place of observation, thus serving the purpose of the mariner's compass, but more accurately, because of the fact that the compass indicates the magnetic pole and not the true pole. The following formulæ pertaining to the subject were furnished:—

$$T=\pi\sqrt{\frac{A+C_1+A_2}{C\omega\Omega\cos\lambda}}\qquad T^1=\pi\sqrt{\frac{A+C_1+A_2}{C\omega\Omega}},$$

where T and T^1 are the durations of a complete oscillation of the gyroscope when its axis is made to remain in the horizontal and the meridian planes respectively; ω and Ω the angular velocities of rotation of the earth and the gyroscope respectively; A, A_1, A_2 and C, C_1, C_2 the equatorial and the axial moments of inertia of the gyroscope and the two rings on which it is mounted. From these formulæ the latitude (λ) of the place of observation is derived, namely:—

$$\cos\lambda=\frac{T^{12}}{T^2}.$$

—Prof. F. E. Nipher made a further statement concerning his results in the attempt to produce ether waves by the explosion of dynamite. He had obtained some results which seemed to show that magnetic effects could be thus produced.

DIARY OF SOCIETIES.

THURSDAY, FEBRUARY 6.

ROYAL SOCIETY, at 4.30.—The Stratifications of Hydrogen: Sir William Crookes, F.R.S.—The Density and Coefficient of Cubical Expansion of Ice: Dr. J. H. Vincent.—On the Increase of Electrical Resistivity caused by alloying Iron with various Elements, and the Specific Heat of those Elements: Prof. W. F. Barrett, F.R.S.—Continuous Electrical Calorimetry: Prof. H. L. Callendar, F.R.S.

SOCIETY OF ARTS, at 4.30.—The Coal Resources of India: Prof. W. R. Dunstan, F.R.S.

LINNEAN SOCIETY, at 8.—On a Method of Investigating the Gravitational Sensitiveness of the Root-tip: F. Darwin, F.R.S.—An Extinct Family of Ferns: Dr. D. H. Scott, F.R.S.

CHEMICAL SOCIETY, at 8.—An Investigation into the Composition of Brittle Platinum: W. N. Hartley.—Conversion of *l*-Hydroxycamphene into β-Halogen Derivatives of Camphor: M. O. Forster.—Tetrazoline, Part II.: S. Ruhemann and H. E. Stapleton.—(1) The Solubilities of the Calcium Salts of the Acids of the Acetic Acid Series; (2) The Equilibrium between a Solid and its Saturated Solution at various Temperatures: J. S. Lumsden.—The Influence of Temperature on Association in Benzene Solution, and the Value of the Molecular Rise of Boiling Point for Benzene at Different Temperatures: W. R. Innes.—The Magnetic Rotation of Ring Compounds; Camphor, Limonene, Carvene, Pinene, and some of their Derivatives: W. H. Perkin, sen., F.R.S.—Polymerisation Products from Diazoacetic Ester: O. Silberrad.

RÖNTGEN SOCIETY, at 8.30.—A System of Radiography: E. W. H. Shenton.

FRIDAY, FEBRUARY 7.

ROYAL INSTITUTION, at 9.—The New Mammal from Central Africa and other Giraffe-like Animals: Prof. E. Ray Lankester, F.R.S.

GEOLOGISTS' ASSOCIATION, at 7.30.—Annual General Meeting.—Address on a Dozen Years of London Geology (Eocene, Chalk, and Underground): W. Whitaker, F.R.S., President.

MONDAY, FEBRUARY 10.

SOCIETY OF ARTS, at 8.—Personal Jewellery from Prehistoric Times: Cyril Davenport.

IMPERIAL INSTITUTE, at 8.30.—The Coloured Races in Australia: Hon. Sir Horace Tozer, K.C.M.G.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—The Ancient Kingdom of Kongo; Rev. Thomas Lewis.

TUESDAY, FEBRUARY 11.

ROYAL INSTITUTION, at 3.—The Cell: its Means of Offence and Defence: Dr. A. Macfadyen.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Port of Dundee: G. C. Buchanan.

WEDNESDAY, FEBRUARY 12.

SANITARY INSTITUTE, at 8.—Discussion on the Prevention of Small-Pox in the Metropolis: Opened by A. Wynter Blyth.

THURSDAY, FEBRUARY 13.

ROYAL SOCIETY, at 4.30.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Researches on the Electrical Conductivity and Magnetic Properties of upwards of 100 different Alloys of Iron: Prof. W. F. Barrett, F.R.S., and W. Brown.—On some Conclusions deduced from the preceding Paper: Prof. W. F. Barrett, F.R.S.

MATHEMATICAL SOCIETY, at 5.30.—On the Density of Linear Sets of Points: W. H. Young.—On Plane Cubics: Prof. A. C. Dixon.

FRIDAY, FEBRUARY 14.

ROYAL INSTITUTION, at 9.—Magic Squares and other Problems on a Chess Board: Major P. A. MacMahon, F.R.S.

PHYSICAL SOCIETY, at 5.—Annual General Meeting.—Address by the President, Prof. S. P. Thompson, F.R.S.—Mr. T. H. Littlewood will exhibit an Atwood's Machine.

ROYAL ASTRONOMICAL SOCIETY, at 3.—Annual General Meeting.

MALACOLOGICAL SOCIETY, at 8.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Some Public Health Aspects of the Question of Sewage Disposal: C. Johnston.

SATURDAY, FEBRUARY 15.

ROYAL INSTITUTION, at 3.—Some Electrical Developments: Lord Rayleigh, F.R.S.

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