by the opponents of the statute was so artfully worded as to rouse theological suspicions. Reference was made to the undesirability of the comparative study of religions, and it was obvious that a considerable proportion of those who attended to vote against the measure, had come in obedience to a summons to resist the enemy, and were in no way qualified to form a judgment on educational matters. The larger proportion, however, consisted of those classical teachers whose belief it is that science may safely be ignored in a nineteenth century education and that a "good general education" means only a training in the Greek and Latin languages, with a smattering of ancient history and philosophy. The result of the vote was a great disappointment to those who had hoped that the work of Prof. Tylor, Prof. Arthur Thomson, and Mr. H. Balfour, would find its fruition in a small but earnest school of anthropologists in Oxford.

THE National Association for the Promotion of Technical and Secondary Education has made arrangements for a Conference of the representatives of Technical Education Committees to be held at the Royal United Service Institution, on July 11, when the Duke of Devonshire, President of the Association, will take the chair. The object of this Conference is to discuss means whereby the various authorities charged with the provision of technical education may be brought into closer relationship, and may be enabled to avail themselves of the results of the experience of others as regards many important details of their work. Among the subjects which it is proposed to deal with are (*a*) scholarships (local conditions and uniformity in respect to award and tenure), (*b*) evening continuation schools (the co-ordination of their work with that of evening science, art, and technical classes), (*c*) trade and technology classes and their relation to the various trades.

THE chemical and engineering societies formed by the members of many of our polytechnic institutes might emulate, with advantage, the Engineering Society of the School of Practical Science, Toronto. We have lately received a volume of 253 pages containing the papers read before the Society during the session 1894-95. The papers refer to both the theoretical and practical sides of engineering, and their publication cannot but encourage investigation among the students. A plan adopted by this Society, and by a number of American societies of a similar kind, is worth noting. Before a paper is read, 150 proofs of it are distributed among engineers and specialists interested in the subject with which it deals, and their opinions upon any particular point are invited. The replies received are read after the paper, and help to make the discussion more general and of greater value than it otherwise would be.

THE Corporation of the Massachusetts Institute of Technology, Boston, have a good understanding of what technical education means. The following paragraph, from the *Calendar* of the Institute received a few days ago, should be borne in mind by the organisers of technical education in this country:—"The foundation of all sound technological education requires not only thorough theoretical training, but also prolonged, well-directed laboratory drill which shall first give the student the power of close and accurate observation, and then bring him into direct contact with the material problems of his future profession." It is by acting upon this educational principle that the Massachusetts Institute has gained such a large measure of success.

TABLES showing the number and proportion of pupils attending secondary schools in London are given in the *Technical Education Gazette*. The returns obtained show that the number of pupils receiving education in 84 public endowed and public proprietary schools is 19,072, and the number receiving education ni 126 private or semi-private schools is 7107. The proportion which pupils attending secondary schools bear to those attending public elementary schools, may be gathered from the fact that the number per 100,000 of the population attending secondary schools is 623, while the number per 100,000 of the population attending public elementary schools is 16,904.

SCIENTIFIC SERIALS.

Bulletin of the American Mathematical Society, vol. i. No. 8 (May 1895).—Kinetic stability of central orbits, by Prof. Woolsey Johnson, contains an investigation, of an elementary character, of a problem not discussed in the fourth edition (p. 125) of Tait and Steel's "Dynamics of a Particle." It is a satisfactory discussion of the problem so far as it relates to central orbits. The note was read before the Society at its April meeting.—Dr. J. Pierpont, in a short paper, read before the Yale Mathematical Club, entitled "Lagrange's place in the Theory of Substitution," though he cannot vindicate Lagrange's right to the title of creator of the theory of substitutions, presents a few examples of his methods in order to show the importance of considering him from this point of view. "Lagrange was led to the study of this theory by his attempts to solve equations of degree higher than the fourth."—Gauss's third proof of the fundamental theorem of algebra, by Prof. Bôcher, indicates the connection between Gauss's third proof that every algebraic equation has a root and those branches of mathematics which have since been developed under the names of the theory of functions and the theory of the potential. The notes, among other details, give the different courses of lectures in mathematics at American and European colleges.—There is the usual long list of new publications.

Wiedemann's Annalen der Physik und Chemie, No. 5.—Wave-lengths of ultra-violet aluminium lines, by C. Runge. The lines of the spark spectrum near 186 μ wave-length are of great intensity, and may be used as standards of reference. They were therefore carefully determined by means of a Rowland concave grating and sensitive plates prepared by Schumann's method. They were compared with the spectrum of iron, and referred to Rowland's standard wave-lengths for that substance. The figures for the four lines at 760 mm. pressure and 20° C. were 1854·09, 1862·20, 1935·29, and 1989·90. The wave-lengths reduced to a vacuum would be about 0·6 units greater.—On the dichroism of calcspar, quartz, and tourmaline for infra-red rays, by Ernest Merritt. The absorption of the infra-red rays in these substances depends upon the plane of polarisation. Especially in calcspar and in tourmaline the two curves representing the transmittency for the ordinary and the extraordinary ray, respectively, are quite different, so that they appear to be independent of each other. The following absorption bands were observed in these curves: Calcspar, at 2·44 μ and 2·74 μ for the ordinary ray. These are very sharp. Some broad bands also appear at 3·4 μ, 4 μ, and 4·6 μ. The extraordinary ray is absorbed at wave-lengths of 3·28, 3·75, and 4·66 μ. Quartz shows an absorption band for the ordinary ray at 2·9 μ. When the wave-length exceeds 4·75 μ the substance is practically opaque for both rays. Tourmaline absorbs the ordinary ray of wave-length 2·82 μ. The two curves intersect at 2·30 μ and again at 3·84 μ, so that between these two points the dichroism of tourmaline is reversed. —On the transmittency of solid bodies for the luminiferous ether, by L. Zehnder (see p. 153).—On the measurement of high temperatures with the thermo-element and the melting-points of some inorganic salts, by John McCrae. The melting-points of a number of salts, chiefly alkaline haloids, were determined by means of a platinum and platinum-rhodium couple, whose E.M.F. is proportional to the temperature between 300° and 1400°. The temperature of the alcohol flame, as shown by the same couple, was 1488°, and that of the Bunsen flame at its hottest part, 1725° C.—On electric resonance, by V. Bjerknes. This is an important contribution to the theory of Hertzian oscillations. The author considers the effect of the periods of the oscillator and the resonator, and their logarithmic decrements, together with a constant measuring the intensity of the oscillations. He thus arrives at several fundamental laws, such as: The secondary spark potential is proportional to the square of the period of the resonator, the magnetic or thermal integral effect to its cube, and the electric integral effect to its fifth power.

SOCIETIES AND ACADEMIES.

LONDON.

Physical Society, June 14.—Captain W. de W. Abney, President, in the chair.—Mr. Burstall continued the reading of his paper on the measurement of a syclically varying temperature. Three sizes of platinum wire have been employed for the thermometers in order that some idea might be formed as to the magnitude of the error caused by the lag of the temperature of the wire behind that of the gases. The constants of the platinum thermometers were determined either by comparison with a standard Callendar platinum thermometer or by means of

ice, boiling water and boiling sulphur. In most cases the thermometer constants were determined after the wire had been exposed to the action of the hot gases for about half an hour. One wire, however was calibrated before being used, and an unusually high value was obtained for the coefficient δ. After this wire had been exposed to the hot gases, the value of δ fell, however, to the normal. The author thinks the abnormal value may have been due to the formation of a gold platinum alloy during the process of attaching the wire to the leads, and that this alloy was subsequently swept off by the hot gases. The paper includes a number of tables and curves which embody the numerical results, and show that concordant results can be obtained on different days and with different thermometers. Prof. Perry said that an instrument for quickly recording varying temperatures was greatly required by engineers. The temperature just inside the cylinder walls was, however, the most important to determine, and a knowledge of how the temperature from 1 to 2 m.m. inside the walls varied would be of the greatest importance. He would like to ask the author if the observed temperatures agreed with the values calculated on the assumption that the gases in the cylinder behaved as a perfect gas, and that $\frac{PV}{T}$ was constant during the whole stroke. Differences between the observed and calculated values might be due to dissociation, and not entirely to lag in the thermometers. It was astonishing that even the fine wires employed were able to follow the rapidly varying temperature, and he would like to see some special experiments made to test this point. Prof. Capper showed a diagram giving the values calculated on the assumption that $\frac{PV}{T}$ = constant. In such a calculation it was necessary to assume some temperature as a starting-point, and in general this temperature was obtained from an analysis of the exhaust gases, so that the calculated curve is most likely to depart from the truth at the commencement of the stroke. He, Prof. Capper, hoped that the author would be able to accurately determine the temperature of some one point of the stroke, and he suggested that the point where the observed curve crossed the theoretical curve would be the most suitable one for this purpose. Such a point must exist, since at the commencement of the stroke the lag causes the observed temperature to be too low, while at the end of the stroke the observed temperatures are too high. Mr. Burstall finds a curious bump in his curves, and it is curious that a similar bump exists in the calculated curves. From the constancy with which this bump appears, it would seem that it must have some physical meaning. It was important to remember that the expansion in the gas-engine cylinder is not adiabatic, for heat is both abstracted and generated during the stroke. Mr. Blakesley suggested that since the temperatures dealt with were sufficient to make the wire red-hot, the question arose whether lag might be investigated by the wire being examined by means of Becquerel's phosphoroscope, at a known interval after the removal of the source of heat. Mr. Griffiths said he considered an important source of error was the large thermal capacity of the leads when the working wire was so very short. He thought it would be possible to standardise the thermometers under conditions similar to those which occur in the engine cylinder. Thus perhaps alternate gushes of air at 0° and 100° C. might be used. The use of gold to attach the fine wire to the leads was objectionable, since the gold must permeate the platinum for quite an appreciable fraction of the whole length of the wire. He would like to know whether the change in δ alluded to by the author occurred with the first explosion, or whether it was a gradual one. Mr. Enright pointed out that the nature of the working substance in a gas engine varied during the stroke. Prof. Perry said that the change in the specific volume of the gases before and after combustion did not amount to more than 1·25 per cent. Mr. E. Wilson said he thought it was most important to shorten the time of contact, since at present the galvanometer readings corresponded to the mean temperature over a range of about 5 per cent. of the whole stroke. It might be possible to make use of a condenser to get over this difficulty. Prof. Rücker said that the Kew Observatory were making arrangements to undertake the testing of platinum thermometers. Mr. Enright suggested that with a very short contact induced currents might cause errors. Mr. Rhodes said that he had found that the method of determining the zero point of thermometers, by means of melting ice, was far from satisfactory, and that the results obtained could not be depended upon to within 0°·1 C. The author, in his reply, said the only chemical action on the wires he thought probable was the formation of a carbide. After several hours use, however, the wires appear quite bright and clean.—Mr. N. F. Deerr read a paper on the thermal constants of the elements. The object of the paper is to establish the following laws: If T denote the melting-point on the absolute scale, C the mean coefficient of expansion between zero and the melting-point, S the mean specific heat, and L the latent heat of fusion, then, for any family in Mendeléef's periodic classification, the following relations will hold between metals and metals, and between non-metals and non-metals:

$$\left(T + \frac{L}{S}\right) C = \text{const.}$$

$$TC = \text{const.}$$

$$\frac{LC}{S} = \text{const.}$$

In the absence of other data, the mean values of C and S between 0° and 100° have been taken. Anomalous values are obtained in the case of gold and mercury, if these metals are included in their usual positions. The author considers that the thermal constants indicate that gold ought to be placed among the transition elements. He further proposes to place mercury in a new group to come before the lithium group. Such a group, he suggests, would contain hydrogen, argon and mercury. The paper concludes with an attempt to justify the expression

$$\left(T + \frac{L}{S}\right) C = \text{const.}$$

on theoretical grounds. Dr. Gladstone considered that the paper contained valuable numerical relationship, and that the second and third formulæ were much more strongly supported by the data given than the first formula. He, the speaker, had previously noticed that the elements of the transition group might be subdivided into sub-groups, and that the elements of each of these sub-groups were particularly closely related. He agreed with the author that gold ought not to be included in the first group. Mr. F. H. Neville said that since the author did not give the source of the data he had employed, most of the results given were rather indefinite. For example, while the author gives 870° as the melting-point of aluminium, Mr. Haycock and himself had found the value 927°. The value of the latent heat of aluminium given was 29·3, while Pionchon, in a recent paper in the *Comptes rendus*, gives the value 80. Theoretical considerations appear to indicate that 80 is the minimum value possible. The author assumes that when you heat a substance from the absolute zero to its melting point, all the energy supplied is expended in the work of expansion. Some of the heat, however, must be employed in changing the kinetic energy of the molecules, even in the case of a solid. Prof. Worthington said that in some cases the amount of work done against cohesive forces between 0° and 100° was much less than one ten-thousandth of the whole amount of energy supplied. Mr. Griffiths said he did not believe in any generalisation which depended on the values of the specific heats determined between 0° and 100°, the rate of change with temperature of specific heat being so great. The author in his reply said he had made every endeavour to obtain the most accurate data for his calculations. The value 29·3 for the latent heat of aluminium was obtained from a paper by J. G. Richards.—A paper on an electromagnetic effect, by Mr. F. W. Bowden, was postponed till the next meeting.

Entomological Society, June 5.—The Right Hon. Lord Walsingham, F.R.S., Vice-President, in the chair.—Dr. Sharp, F.R.S., exhibited, on behalf of Dr. G. D. Haviland, two species of *Calotermes* from Borneo, the individuals being alive and apparently in good health; one of the two small communities (which were contained in glass tubes) consisted of a few individuals of the immature sexual forms and of a neoteinic queen; this latter had increased somewhat in size during the eight months it had been in Dr. Haviland's possession, but no eggs had been deposited, neither had any of the immature individuals developed into winged forms. The second community exhibited consisted entirely of the immature sexual forms, and this community had produced numerous winged adults while it had been in Dr. Haviland's possession. Specimens were also exhibited to illustrate the neoteinic forms that were produced in Borneo after a community had been artificially orphaned. As regards these, Dr. Sharp expressed

the hope that Dr. Haviland would shortly publish the very valuable observations he had made. In the case of a species of fungus Termite, Dr. Haviland had found that the community had replaced a king and queen by normal, not by neoteinic forms.—Mr. McLachlan, F.R.S., exhibited examples of the female of *Pyrrhosoma minium*, Harris, having the abdomen incrusted with whitish mud through ovipositing in a ditch in which the water was nearly all dried up. He had noticed the same thing in other species of Agrionidæ.—Mr. Roland Trimen, F.R.S., exhibited some specimens of "Honey" Ants, discovered at Estcourt, in Natal, about a year ago, by Mr. J. M. Hutchinson. The species has not been identified, but is quite different from *Myrmecocystus* and *Camponotus*—the genera which have long been distinguished as containing species, some of whose workers are employed as living honey-pots for the benefit of the community. The specimens exhibited included six "globulars"—to use Mr. McCook's term in regard to the American species, *Myrmecocystus hortus-deorum*—all with the abdomen enormously distended with nectar; but other examples presented to the South African Museum by Mr. Hutchinson comprised various individuals exhibiting different gradations of distension, thus indicating that the condition of absolute repletion is arrived at gradually, and may possibly be reached by some few only of those individuals who feed, or are fed, up for the purpose. Certainly, in the nests examined by Mr. Hutchinson, in Natal, the number of "globulars" was very small in proportion to the population of ordinary workers; and it is somewhat difficult to understand of what particular value as a food reserve so very small a quantity of nectar so exceptionally stored can be. Mr. Trimen added that while the occurrence of "Honey" Ants in Southern, North America, South Australia, and he believed also in India, was well known, the Natal species now exhibited was the first African one that had come under his notice.—Dr. Sharp exhibited a series of Coleoptera, to illustrate variation in size.—Herr Brunner von Wattenwyl made a communication informing the Society that a most unfortunate error had crept into the table of genera in his Monograph of *Pseudophyllides*; on page 9, line 1, and on page 13, line 37, instead of "mesonotum" should be read "mesosternum."

Geological Society, June 5.—W. H. Hudleston, F.R.S., Vice-President, in the chair.—On a well-marked horizon of Radiolarian rocks in the Lower Culm Measures of Devon, Cornwall, and West Somerset, by Dr. G. J. Hinde and Howard Fox. In the Lower Culm Measures the basal *Posidonomya*-beds and the Waddon Barton beds with *Goniatites spiralis* consist of fine shales with thin limestones, and above these are the beds which form the subject of the present paper. The Upper Culm Measures consist of conglomerates, grits, sandstones, and shales, with occasional beds of culm. There is evidence of the partial denudation of the radiolarian rocks during the accumulation of the Upper Culm beds, as indicated by the presence of pebbles of the former in the latter. The radiolarian beds consist of a series of organic siliceous rocks—some of a very hard cherty character, others platy, and yet others of soft incoherent shales. The term "grits," which has been used in connection with these beds, is a misnomer; there are beds which are superficially like fine grits, but they are found to be radiolarian deposits. At present there are not sufficient data for estimating the thickness of the radiolarian deposits; but they are probably some hundreds of feet thick, though the whole does not consist of beds of organic origin. In a quarry in the Launceston district 50 feet of radiolarian cherty rock are seen without admixture of shale. A detailed description of the lithological characters of the rocks of the series was given, and analyses by Mr. J. Hort Player; a marked feature of their composition is the very general absence of carbonate of lime. The microscopic characters of the rocks were also described, and the small amount of detrital matter in the beds of the series was noted. The fossils tend to confirm the view that the Lower Culm Measures are the deep-water equivalents of the carboniferous limestone in other parts of the British Isles, and not shallow-water representatives of deeper beds occurring to the north, as was formerly supposed. In connection with this it was noted that the deep-sea character of the Lower Culm of Germany, which corresponds with our Lower Culm Measures, was maintained by Dr. Holzapfel even before the discovery of radiolaria in the beds of Kieselschiefer furnished such strong evidence in support of this view.—The geology of Mount Ruwenzori and some adjoining regions of Equatorial Africa, by G. F. Scott-Elliot and Dr. J. W. Gregory. Ruwenzori is a mountain between the Albert and Albert Edward Nyanzas. Topographically it is a narrow ridge which extends for about 50 miles in a direction from north-north-east to south-south-west. Its summit attains a height of 16,500 feet. The western slope is at an angle of 22°; the eastern slope at about one of 4°. The authors described sections across the ridge at right angles to its trend. These showed that Ruwenzori is not volcanic, nor is it a simple *massif* of diorite. Epidiorite occurs only as banded sheets in the schists on the flanks of the mountain, and is not the central rock of the ridge. The strike of the flanking schists seems to run concentrically round the ridge as though the central rock were intrusive into them. The highest rock collected, a coarse-grained granite or granitoid gneiss, may be an intrusive igneous rock, but it may be part of the old Archæan series faulted up; there is nothing in its microscopical characters to separate it from the Archæan rocks, and the authors thought it probable that this rock was raised into its present position by faulting. In this case Ruwenzori is simply composed of an orographic block or "scholl," which was at one time probably part of a wide plateau of Archæan rocks. There is abundant evidence of volcanic action around Ruwenzori, for the plains, especially to the east and south-east, are studded with small volcanic cones, arranged on lines which radiate from Ruwenzori. Evidence points to the former occupation of the Nyamwamba, Mubuku, and Batagu valleys by glaciers, *roches moutonnées* of typical character having been noted in the two former valleys. The country round Ruwenzori consists of rocks which may be conveniently grouped into two series—one composed of gneisses and schists, and the other of non-foliated sediments. The former (the Archæn series) are of the type that has an enormous extension in Equatorial Africa, and forms the main plateau on which all the sediments and volcanic rocks have been deposited. The sedimentary rocks are probably Palæozoic, possibly pre-carboniferous, but in the absence of fossils it would be unsafe to go beyond this statement.—On overthrusts of tertiary date in Dorset, by A. Strahan. The results given in this paper were obtained during a re-survey of South Dorset on the 6-inch scale. The disturbances can be divided into two groups—the one being mainly of Miocene date, and the other of intra-cretaceous (between Wealden and Gault) age. The former includes the Isle of Purbeck fold (which is the continuation of the Isle of Wight disturbance), the Ringstead fold, the Chaldon and Ridgeway disturbances, and the Litton Cheney fault. In the latter are placed the anticline of Osmington Mill, the syncline of Upton, and a part of the anticline of Chaldon; farther west the Broadway anticline and Upway syncline, a fault at Abbotsbury, and many other folds come into the same group. These earlier movements led to the well-known unconformity at the base of the Upper Cretaceous rocks.

Linnean Society, June 6.—Mr. W. Percy Sladen, Vice-President, in the chair.—The minutes of the last meeting having been read and confirmed, the Chairman, on behalf of the President, declared the following to be Vice-Presidents:—Messrs. J. G. Baker, F. Crisp, A. Lister, and W. P. Sladen. Mr. B. B. Woodward was elected a Fellow.—Mr. M. Buysman, who has laboured for many years to establish a garden at Middleburg for economic plants, exhibited specimens to show the excellence and completeness of his preparations.—On behalf of Mr. T. J. Mann, who had lately returned from Ceylon, Mr. Harting exhibited specimens of a butterfly, *Catophaga galena*, Felder, which had been observed migrating in thousands across the northern part of the island during March and April last, in a direction from north-east to south-west. The movement commenced about 7 a.m. and lasted until noon, when it decreased, and was resumed in the afternoon for another two hours. Mr. Harting referred to the remarks on this subject made by Sir J. Emerson Tennent ("Nat. Hist.," Ceylon, 1861, p. 404, note) to the observations of Darwin on the countless myriads of butterflies met with at sea some miles off the mouth of the Plata, and to a paper by Mr. R. McLachlan on the migratory habits of *Vanessa cardui* (*Entom. Mo. Mag.*, xvi. p. 49). He did not think that the movement was analogous to the migration of birds which migrated in opposite directions in spring and autumn, for the insects moved only in one direction, and did not return, vast numbers perishing *en route*. The phenomenon rather resembled what had been observed in the case of lemmings, locusts, and dragon-flies (Weissenborn, *Mag. Nat. Hist.*, n.s., vol. iii. p. 516), and might be explained as a sudden exodus from the birthplace, leading to a compensating reduction of the species after a season exceptionally favourable to its increase. His

remarks were criticised by Colonel Swinhoe, who was inclined to confirm this view, and by Mr. Kirby, who referred to the particular species which were found to take part in these so-called "migrations."—A new *Distomum* was described by Mr. G. West, whose observations were favourably criticised by Mr. W. P. Sladen and Prof. Howes.—On behalf of Mme. van der Bosse, Mr. George Murray communicated a description of a new genus of Algæ (*Pseudocodium*), the characters of which were minutely pointed out by means of specially-prepared lantern slides.—A paper was then read by Mr. A. Vaughan Jennings on the nature of *Mobiusispongia parasitica*, on which critical remarks were made by Prof. Rupert Jones and Mr. F. Chapman.—A second paper by Mr. Vaughan Jennings contained a description of a new genus of Foraminifera of the family *Astrorhizidæ*.

PARIS.

Academy of Sciences, June 10.—M. Lœwy in the chair.—On the Meudon Physico-Astronomical Observatory, by M. J. Janssen. An account of the present state of the Observatory and of the difficulties through which it has passed on account of the reductions made in the State grants and appropriations, together with some details of the work done since 1876.—On the necessarily harmonic form of expression, for the displacements of each particle in an ocean roller, as a function of the time, by M. J. Boussinesq.—Note on the photographic surveys executed in 1894 by the Canadian engineers and the United States Coast and Geodetic Survey Service for the delimitation of Alaska and British Columbia, by M. A. Laussedat. This is an account of the spread of the Canadian method into the United States Service, and a review of the general adoption of similar processes in other countries.—Solar observations made at Lyons Observatory during the first quarter of 1895, by M. J. Guillaume.—On algebraical curves of constant twist and on algebraical minima surfaces inscribed in a sphere, by M. E. Cosserat.—New theorems in arithmetic, by P. Pepin.—On an explosive system capable of demonstrating the rotation of the terrestrial globe, by M. Jules Andrade.—Spectroscopic study of carbons from the electric furnace, by M. H. Deslandres. Two carbon poles used in M. Moissan's electric furnace were examined. Those parts of the carbon removed from the arc showed the usual spectra of impurities, whereas the parts in the arc were free from all impurities except calcium. The growths on the negative pole were of greatest purity, and furnished carbon spectra showing wave-lengths (cited) much fewer than those recorded for carbon by Hartley and others. The purification of the carbons by the passage of the current in the arc is due to the volatilisation of the more volatile constituents at the high temperature obtained.—On sensitive flames, by M. E. Bouty.—Physical properties of acetylene; acetylene hydrate, by M. P. Villard. A table of pressures corresponding to certain temperatures is given for acetylene, together with a table of dissociation pressures for the hydrate of acetylene. This hydrate resembles the hydrates of nitrous oxide and carbon dioxide, and is represented as $C_2H_2.6H_2O$. Its heat of combination is 15·4 Cal. per molecule, very near to the value, 15·0 Cal., obtained for carbon dioxide and nitrous oxide.—Synthetical production of nitro-alcohols, by M. Louis Henry.—Condensation of aldehydes and saturated ketones, by MM. Ph. Barbier and L. Bouveault. The researches detailed appear to establish the fact that only ordinary acetone can condense easily with aldehydes; on the other hand, as the molecular weight of the aldehydes increases, the aptitude for condensation with acetone diminishes, and the principal reaction becomes the condensation of the aldehyde itself.—On the causes of the colouration and the coagulation of milk by heat, by MM. P. Cazeneuve and Haddon. The conclusions are drawn: (1) That the yellowing of milk by heat is due to oxidation of lactose in the presence of the alkaline salts of the milk; (2) the oxidation of lactose produces acids, formic among others, and hence causes coagulation of the milk; (3) the coagulated casein is not itself altered, but is merely tinted by the decomposition products of lactose.—Esters of the active α-oxybutyric acids, by MM. Ph. A. Guye and Ch. Jordan.—On the history of the alkaloids of the Fumariaceæ and Papaveraceæ, by M. Battandier.—Contribution to the study of germination, by M. Th. Schlœsing. The germination of lupin seeds or wheat does not entail an appreciable loss of nitrogen in the gaseous state.—On amylase, by M. Effront.—The Cecidomyia of oats (*Cecidomyia avenæ*, nov. sp.), by M. Paul Marchal.—The epidermal cell of insects: its paraplasm and its nucleus, by M. Joannes Chatin.—On the relation of the thermal springs of Néris and Evaux with ancient faults of the Central Plateau, by M. L. de Launay.—On the succession of fauna of the Upper Lias and Lower Bajocien in Poitou, by M. Jules Welsch.—Researches on the modifications of nutrition in persons suffering from cancer, by MM. Simon Duplay and Savoire. The differences observed in amounts of urea and phosphoric acid excreted by cancerous patients, as compared with the normal healthy excretion, are due entirely to defective nutrition, and disappear when a suitable régime is used. These differences cannot be used for purposes of diagnosis.—On the use of chloride of lime and its mode of action against the bite of venomous serpents, by MM. C. Phisalix and G. Bertrand.—Storms of five days from May 20 to May 25, 1895, in Bohemia, by M. Ch. V. Zenger.

BOOKS, PAMPHLETS, SERIALS, &c., RECEIVED.

BOOKS.—A Chapter on Birds. Rare British Visitors: Dr. R. B. Sharpe (S.P.C.K.).—The Metallurgy of Iron and Steel. Vol 1. The Metallurgy of Iron: T. Turner (Griffin).—The Story of the Plants: Grant Allen (Newnes).—England's Treasure by Foreign Trade: T. Mun, 1664 (Macmillan).—Natural History of Aquatic Insects: Prof. L. C. Miall (Macmillan).—Chemistry, Inorganic and Organic: C. L. Bloxam, 8th edition, rewritten and revised by Thomson and Bloxam (Churchill).—The Great Frozen Land: F. G. Jackson (Macmillan).

PAMPHLETS.—Report of the Director of the Observatory to the Marine Committee, Liverpool Observatory, Bidston, 1894 (Liverpool).—Les Variations Périodiques des Glaciers des Alpes, Report, 1894: Prof. Forel (Berne).—White Servitude in the Colony of Virginia: J. C. Ballagh (Baltimore).—Protection from Lightning: A. McAdie (Washington).

SERIALS.—American Naturalist, June (Philadelphia).—Journal of the Franklin Institute, June (Philadelphia).—Abstract of Proceedings of the South London Entomological and Natural History Society, 1894 (London).—Seismological Journal of Japan, Vol. 4 (Yokohama).—Mathematical Gazette, May (Macmillan).—Mémoires de la Société de Physique et D'Histoire Naturelle de Genève, tome xxxii. Première Partie (Genève).—Kew Observatory, Richmond, Report for the Year 1894 (Harrison).—Bulletin of the Geological Institution of the University of Upsala, Vol. 2, Part 1, No. 3 (Upsala).—Massachusetts Institute of Technology, Boston, Annual Catalogue, 1894-95 (Cambridge, Mass.).

Betts's Chromoscope (Philip).

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