

crease of schools for technical education may help or hinder the development of the Central Technical College remains to be seen. If to some extent it increases the competition for students, on the other hand it may, in the long run, more than compensate for this by increasing the public appreciation of the value of technical education. It is also suggested that probably the falling off in the number of candidates for admission is chiefly due to the continued commercial depression, and happily this is a disadvantageous condition which may be expected to pass away.

A copy of the programme of the College, received at the same time as the report, shows that the College is far and away in advance of similar institutions in London, and is in the highest degree competent to provide "for the higher technical education, in which advanced instruction shall be provided in those kinds of knowledge which bear upon the different branches of productive industry, whether manufactures or arts."

### SCIENTIFIC SERIALS

*American Journal of Science*, February.—On the relation of gravity to continental elevation, by T. C. Mendenhall. Determinations of the intensity of gravitation made by the Coast and Geodetic Survey, and by Commander Defforges, and extending across the North American continent, bring out the fact that the deviations from the values of gravitation as deduced from the theoretical shape of the earth's spheroid, are in a direct relation to the elevation of the observing station above sea-level. An explanation based upon differences in the density of the surface layers is difficult to find, but the fact is undoubted.—Glacial phenomena of Newfoundland, Labrador, and Southern Greenland, by G. F. Wright. The ice-sheet of Southern Greenland formerly sent glaciers down through all the fiords, filling them to a height of about 2000 feet, and pushing even to the very margin of the continent. Greenland, therefore, like the rest of the world, has had its ice age, which has already partially passed away. During the maximum of the ice extension, the mountains bordering the sea in Southern Greenland formed innumerable "nunataks." The ice was not thick enough to cover them in solid mass, and there is no probability that the ice extended far out into Davis Straits. In Labrador and Newfoundland, on the other hand, all the mountains were completely covered with glacial ice, which extended far out over the bordering continental plateau. The facts point to considerable preglacial elevations of land, followed in Labrador, at least, by a period of extensive depression below the present level, and subsequent gradual elevation. There is evidence of the recent date of the glacial period, while the indications of recent changes of level point to terrestrial rather than astronomical causes to account for the vicissitudes of the glacial period.—The *Pithecanthropus erectus*, Dubois, from Java, by O. C. Marsh (see pp. 428-29).

*Bulletin of the American Mathematical Society*, vol. i. 4 (New York, January 1895)—A pathetic interest is attached to the second article, "Note on a memoir in Smith's collected papers," as it must have been amongst the last pieces of work done by Prof. Cayley. The memoir is that on the Theta and Omega Functions (Smith papers, vol. ii. pp. 415-623). The notice is a very slight one, and gives an abstract of the contents of the memoir.—The opening paper is a presidential address, delivered before the American Mathematical Society at its annual meeting, December 28, 1894, of which the title is, "The Past and Future of the Society." Dr. McClintock traces the growth of the Society from its origin in 1888 as a small mathematical club, meeting at Columbia College, whose first meeting was called by a circular signed by three young men, up to its present membership of 251. A paragraph points out that the pioneer of all these mathematical societies which have subsequently sprung up was the London Mathematical Society. "There had been no previous example of a similar organisation, and fears were felt and expressed that its management might naturally drift into the hands of a few having time and energy to give to its affairs, and that there might thus be serious danger of its falling into the control of a clique. The lapse of time has developed the fact that the leading members of that Society have been men of broad views, unusually free from personal prejudice, and quick to recognise talent wherever displayed. We may almost

conclude from the history of that Society that proficiency in the science of mathematics is distinct evidence of a well-balanced mind." We repeat the wish we have previously expressed for the continued success of this flourishing young branch. In the Notes the new officers and Council are given, the new President being Dr. George W. Hill.—A long list of new publications closes the number.†

In the numbers of the *Journal of Botany* for January and February, new plants are described by Mr. A. Fryer from Scotland (a new hybrid *Potamogeton*); by Mr. R. P. Murray, from Teneriffe; by Mr. W. Fawcett, from Jamaica; and by Mr. H. N. Ridley, from the Malay Peninsula. Mr. A. Bennett discusses the claims of *Juncus tenuis* to rank as a British species.

### SOCIETIES AND ACADEMIES.

#### LONDON

**Chemical Society**, February 7.—Dr. H. E. Armstrong, President, in the chair.—The following papers were read: The action of heat on ethylic  $\beta$ -amidocrotonate; Part ii., by J. N. Collie. During the destructive distillation of this salt,  $\alpha$ , $\gamma$ -dimethyl  $\alpha^1$ -ethoxyppyridine, a dimethylpyrrol and a pyridine derivative,  $C_6H_8N_2O$ , are produced together with ethylic lutidonemonocarboxylate.—The acidimetry of hydrogen fluoride, by T. Haga and Y. Osaka. Phenolphthalein is the best indicator to use in the titration of hydrofluoric acid. The authors' experiments with litmus suggest that the molecular composition of hydrogen fluoride is  $H_3F_3$  or  $H_4F_4$ .—Composition of ancient silver ornaments from Peru, by Miss C. Walker.—Molecular change in a silver amalgam, by Miss F. T. Littleton.—On heating silver amalgam, preferably of the composition  $Ag Hg_4$ , considerable swelling occurs; this can only be attributed to molecular change, inasmuch as gas is not evolved.—Sulphocamphylic acid II., by W. H. Perkin, jun. Further evidence has been obtained indicating that this acid has the composition  $C_8H_{12}(SO_3H).COOH$ ; the acid yields two isomeric acids  $C_8H_{11}.COOH$  on fusion with potash. Other new derivatives have been obtained.—Derivatives of ethylorthotoluidine, by W. MacCallum, jun.—Acetyl derivatives of benzaconine and aconitine, by W. R. Dunstan and F. H. Carr. A number of unsuccessful attempts have been made to convert benzaconine into aconitine by introducing an acetyl group; two isomeric triacetylbenzaconines and a tetracetylbenzaconine are obtained on acetylation. The authors have also prepared di- and tri-acetylaconitine and triacetylpyraconitine.—Aconitine aurichlorides, by W. R. Dunstan and H. A. D. Jowett. A new examination of the three modifications of aconitine aurichloride confirms the authors' previous assertions as to the existence and nature of these compounds. The alcoholate of aconitine aurichloride described by Freund and Beck is the  $\beta$ -aurichloride containing a little alcohol.

**Entomological Society**, February 6.—Prof. Raphael Meldola, F.R.S., President, in the chair.—The President announced that he had nominated the Right Hon. Lord Walsingham, F.R.S., Mr. Henry John Elwes, and Prof. Edward B. Poulton, F.R.S., Vice-Presidents of the Society for the Session 1895-96.—Mr. W. F. H. Blandford made some remarks regarding Mons. Brongniart's donation to the library, of his monograph entitled "Recherches pour servir à l'histoire des Insectes Fossiles des Temps Primaires." Mr. Blandford also called attention to figures of pupæ of species of *Spalgis* (Lycenidæ), in the *Journal of the Bombay Natural History Society*. A discussion followed, in which Mr. Hampson and Mr. McLachlan took part.—Canon Fowler exhibited, on behalf of Mr. C. A. Myers, an unusually fine specimen of *Sphæria robertsi*, growing from the prothorax of an underground larva of a *Hepialus*, supposed to be *H. virescens*, from New Zealand. Mr. McLachlan said that there was a doubt whether the caterpillar should be referred to this species. Mr. Blandford stated that the French Government had set aside a section of the Pasteur Institute at Paris for the study of entomophagous fungi.—Prof. L. C. Miall, F.R.S., and Mr. N. Walker, communicated a paper entitled "On the Life History of *Pricoma canescens* (Psychodidæ)," with an Appendix by Baron Osten-Sacken.—Herr Jacoby read a paper entitled "Contributions to our knowledge of African Phytophagous Coleoptera." Dr. D. Sharp, F.R.S., remarked that Erichsen began the "In-

sekten Deutschlands" some sixteen years ago, and as he was engaged on a classification of the Coleoptera of the world, he included a considerable number of these exotic species in his work.—Mr. G. F. Hampson read a paper entitled "Descriptions of New Heterocera from India."

**Mineralogical Society, February 5.**—Dr. Hugo Müller, F.R.S., in the chair.—Prof. Judd read a paper on some simple crystalline rocks (massive minerals) from India and Australia. From specimens supplied by Mr. T. H. Holland, of the Geological Survey of India, Mr. P. Bosworth Smith, late Government Mineralogist at Madras, and Mr. C. Barrington Brown, the author was able to make known some new types of rocks. Two remarkable forms of corundum-rock were noticed, one from Pipra, S. Rewah, first brought to the knowledge of mineralogists by Mr. F. R. Mallet, and the other from Hunsür Talug, in the Mysore State. A fibrolite-rock, derived from the same district as the last, was also noticed. A new variety of tourmaline (schorl)-rock with a fibrous texture, having a wide distribution in India, was likewise described, and an analysis, together with a description of the optical properties of the mineral, was given. From the Bingera district in New South Wales, two dykes were described as traversing masses of serpentine, one being composed of a green garnet-rock (grossularite?) yielding gold, and the other of picotite, the chrome-spinel.—The Earl of Berkeley read a paper on an accurate method of determining the densities of solids, in the course of which it was shown that by taking suitable precautions with a pycnometer having a thermometer stopper and a capillary at the side, results accurate to 0.03 per cent. could be obtained. The actual values for different crops of rubidium alum were 1.8884, 1.8885, 1.8885 and 1.8889. The chief point of the communication was that the evaporation of the liquid used in the observations ( $\text{CCl}_4$ ) from the film formed between the stopper and the neck of the pycnometer, instead of being a source of error, is utilised to bring the level of the liquid into coincidence with the mark on the capillary.—Prof. Church made a communication on the determination of mineral densities. Three points were specially referred to: The employment of dilute alcohol instead of water was recommended as enabling full advantage to be taken of the sensitiveness of an assay balance; the results quoted for specimens under two grams in weight were probably correct to .003. A method of removing interstitial air by first replacing it with carbon dioxide, and then absorbing this gas by an alkaline solution or by boiled water was described. An account was next given of a method of determining relative densities by means of mercury, the volume of mercury displaced by the mineral being weighed. Although no novelty was claimed for these methods, special precautions in their conduct were named, and illustrations adduced of their application to the determination of mineralogical problems.

## CAMBRIDGE.

**Philosophical Society, February 11.**—Prof. J. J. Thomson, President, in the chair.—On a method of determining the conductivities of badly conducting substances, by Prof. J. J. Thomson. A sphere of the substance the conductivity of which is to be determined is placed inside a coil A through which very rapidly alternating currents are passing. The currents induced on the sphere react on those in the coil. A small coil B placed in series with A contains a highly exhausted bulb in which a ring discharge is produced by the alternating currents. Any change in the intensity of the currents through A produces a change in the brightness of the discharge through the bulb inside B. The effect produced by the sphere inside A is measured by the change in the brightness of the discharge within B, and as the effect produced by the sphere depends on its conductivity, the observation of changes in the brightness of the discharge makes it possible to compare the conductivities of different substances. The paper contains applications of this method to the study of the conductivity of electrolytes under very rapidly alternating currents, of rarefied gases, of gases when entering into chemical combination, of flames, and of the effect of the formation of drops of water from aqueous vapour.—Note on the calibration of the wire of a Wheatstone bridge, by Mr. E. H. Griffiths.

## BERLIN.

**Physiological Society, January 4.**—Prof. du Bois Reymond, President, in the chair.—In the discussion on Prof. Waldeyer's discourse (of December 21, 1894), Dr. Benda and Dr. Rawitz

laid stress on the anatomical difficulties which stand in the way of the generalisations of Golgi's school, and Prof. Gad made his protest from the physiological point of view. Prof. Waldeyer recognised the propriety of the objections made against the newer views as to the minute anatomy of the nervous system, views due to those recent methods of research which have led to a very distinct advance in knowledge. Dr. Ziegenhagen communicated the results of his researches on the development of the blood-vessels in trout-embryos, based on observation of the living object, on injections by Wertheim's method, and on photographs.

January 18.—Prof. du Bois Reymond, President, in the chair.—Dr. Benda explained the preparations he exhibited of nerve-endings in muscles made by Prof. Sihler, of Cleveland.—Dr. Rawitz described a new method of staining cells with aniline dyes, which consists in first mordanting the tissues, hardened in Flemming's fluid, with tannin and tartar emetic, and then treating them with the dye. By this method of "adjective" staining, only the protoplasm of the cell is coloured, not the nucleus. The same speaker next described some results of his method as applied to resting-cells of salamander testis. The nucleus shows the brown-coloured chromatin filaments; the linin network and the distinct nuclear membrane are of a pale red colour. In the middle of the protoplasm, at some distance from the nucleus, is the dark-red attraction sphere with the centrosome in its midst. Close-set meshes of the network of red fibrils, which permeate the protoplasm, and are in other parts less close-set, join on to the periphery of the sphere, and are in direct communication with the nuclear membrane and the linin filaments. Occasionally the attraction spheres of two neighbouring cells are joined together by a dark-red filament.—Dr. Cohnstein described experiments on the action of intravenous injections of sodium chloride on the composition of lymph and blood, and showed that the observed variations of quantity and of the amount of water and salt in the lymph, as also the changes in the amount of salt in, and concentration of the blood, could be adequately explained by the purely physical processes of diffusion and filtration.

**Meteorological Society, January 8.**—Prof. Hellmann, President, in the chair.—Dr. L. A. Bauer discoursed on the secular changes of terrestrial magnetism. From the observations available at an extended series of stations he had determined the declination and dip of a magnetised needle freely suspended at its centre of gravity, and had compared the curves of secular change thus obtained with the corresponding formulæ. Taking older compass-charts additionally into consideration, he found that the curves of secular change must contain loops. If one imagines a magnetised needle, freely suspended at its centre of gravity, to be carried round the earth along a given parallel, one obtains the momentary curve of terrestrial magnetism for that parallel, and this curve corresponds to the curve of secular variation. This curve further shows a distinct loop, as, for example, for the parallel 40° N. In the discussion which followed, the President drew attention to the fact that the statements of the older travellers as to compass bearings cannot well be used for determining the components of terrestrial magnetism, since each compass was specially arranged in order to show the astronomical north-pole, and hence it is necessary, first of all, to know what this special arrangement was before their indications can be used.—Dr. Kassner described a "föhn" wind in the Riesengebirge, which was very marked on November 1 and 2 last, on the north fall of the mountain, and caused by the high temperature and excessive dryness. The dryness and great transparency of the air was observed as far as Breslau, a distance of 100 kilometres.

**Physical Society, January 11.**—Prof. du Bois Reymond, President, in the chair.—Dr. Altschul made communications from the Raoul Pictet Institution, dealing first with the influence of intense cold ( $-70^{\circ}$  to  $-200^{\circ}$  C.) on a long series of chemical processes, and in the next place on physical processes, such as phosphorescence, &c. He then reported upon experiments on the behaviour of bodies at the critical temperature. The disappearance and reappearance of the meniscus was found to take place always at the same temperature as long as the warming of the substance was uniform. It was found that the critical temperature is a better criterion of the chemical purity of a liquid than are its melting point and boiling point, and a number of instances were cited where minute impurities altered the critical temperature by many degrees. Solutions of solids when heated above the critical temperature gave no precipitate,

the solid remaining dissolved in the gaseous vapours. Solutions of colouring matter behaved similarly.

January 25.—Prof. du Bois Reymond, President, in the chair.—Mr. Archenhold discussed the principles and advantages of two recently projected telescopes, of which one with a 44-inch object-glass and short focal length is to be set up in the Berlin Industrial Exhibition in May 1896, while the second, with a 50-inch object-glass, is to be taken in hand later on. The glass for the first of the two is already cast by Dr. Schott, of Jena, and is to be ground according to scientific principles by Dr. Steinheil. The speaker further discussed a series of fundamental novelties in the mounting of the telescopes, by which the cost of the same would be materially reduced. The discussion, which was then opened by Prof. von Bezold, on behalf of Profs. Auwers and Vogel, and continued by Prof. Lummer, was adjourned to the next meeting.

[Notice.—In the report of the meeting of the Physiological Society of December 7, 1894, NATURE, vol. li. p. 288, for "Dr. G. Joachim," read "Dr. G. Joachimstal."]

## PARIS.

Academy of Sciences, February 18.—M. Marey in the chair.—On Neumann's method and Dirichlet's problem, by M. H. Poincaré.—On the form of the intrados of arches, by M. H. Resal.—On the kinds of chlorophyll; remarks *à propos* of the note by M. Étard, by M. Arm. Gautier. The author claims priority for the proof that several chlorophylls exist, and that chlorophyll contains no iron, but contains organic phosphorus.—On the agricultural value of aluminium phosphates; remarks *à propos* of M. Andouard's note, by M. Arm. Gautier. In 1893 the author showed that amorphous aluminium phosphate was of value in agriculture owing to its solubility in the products of decomposition present in soils. This does not extend to crystallised phosphates of aluminium or of aluminium and calcium.—On the estimation of tannic compounds, by M. Aimé Girard.—Remarks on atomic weights, by M. Lecoq de Boisbaudran. The author mentions a method of classification of the elements which enables him to calculate their atomic weights as well as predict their properties; this system has not yet been published. According to it, argon belongs to a group of elements of which no other members are yet known. They should be octads of atomic weights as follows: 20·0945, 36·40 ± 0·08, 84·01 ± 0·20, 132·71 ± 0·15; (O = 16). They should be metalloids, the first two members relatively abundant, the others rare. Taken in order, they should respectively be more volatile than oxygen, sulphur, selenium, and tellurium.—The scope and method of a work on the "theory of algebraical functions and their integrals," by M. Appell and M. Édouard Goursat, is explained in a short note by the former.—On the astronomical inscription of Kes-kinto, by M. Paul Tannery. The author draws conclusions with regard to the state of knowledge of planetary periods about 150–50 B.C.—On a surface of the sixth order, allied to abelian functions of the third type, by M. G. Humbert.—On the properties of amorphous silicon, by M. Vigouroux. These properties are very fully given. Speaking generally, amorphous silicon prepared by reduction with magnesium somewhat resembles crystalline silicon in properties. Though somewhat inert at lower temperatures, at high temperatures it is chemically very active.—On the oxidation of the tannin of the cider apple, by M. L. Lindet. This oxidation appears to be due to the action of a ferment of the *laccose* type.—On the composition and analysis of eaux-de-vie, by M. X. Rocques.—On the seeds of the Moabi, by MM. H. Lecomte and A. Hébert. An account of a tree found in French Congo, and of a fat produced from its seeds.—On ferrocyanide, ruthenocyanide, and osmiocyanide of potassium, by M. A. Dufet. A crystallographical paper giving measurements of axial ratios, angles, and optical constants of (1)  $K_4FeCy_6 \cdot 3H_2O$ , (2)  $K_4RuCy_6 \cdot 3H_2O$ , (3)  $K_4OsCy_6 \cdot 3H_2O$ . A remarkable similarity is shown by these compounds throughout the extensive series of measurements given.—On modifications of the blood, brought about by the thermal treatment with Bourbon-le-water from the spring Choussy-Perrière, by M. Ph. Lafon. Conclusions from results of many analyses (quoted): (1) In cases of chloro-anæmia there is generally a notable increase of red corpuscles and oxyhæmoglobin in the blood of patients, due to the treatment. (2) In cases of leucocytæmia the treatment produces a diminution of the numbers of white corpuscles.—On the nucleus and nuclear division in the *Benedemia*, by M. Alphonse Labbé.—On egg-deposition of *Vespa*

*crabro*, L.; conservation of heat in the nest, by M. Charles Janet.—Observations on the upper Tongrian or *Stampien* strata in the Chalosse, by M. L. Rey. —Considerations on contact-metamorphism, derived from a study of the contact phenomena of lherzolite in the Pyrenees, by M. A. Lacroix.—Mineralogical composition and structure of the *silex* of the Paris gypsum, by M. L. Cayeux. Conclusions: (1) The siliceous nodules from gypsum, known as *silex*, have an essentially different micro-structure and mineralogical composition from *silex* properly so called. (2) They result from a substitution of silica for gypsum. (3) The silicification of gypsum causes the production of some one of the arrangements of which quartz is capable. (4) The ultimate term of the series of transformations of saccharoidal gypsum, under the action of silica, is the production of wholly quartzose plates, having the same structure as quartzites.—Earthquake recorded at Grenoble, a note by M. Kilian, February 3, 6h. 2m. 40s. morning.

## BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Books.—Introduction to Physiological Psychology: Dr. Th. Ziehen, translated, 2nd edition (Sonnenschein).—An Elementary Text-Book of Anatomy: Prof. H. E. Clark (Blackie).—Report of Observations of Injurious Insects, &c., 1894: E. A. Ormerod (Simpkin).—Economic Classics—David Ricardo (Macmillan).—Economic Classics—Adam Smith (Macmillan).—A Course of Elementary Practical Bacteriology: Drs. Kanthack and Drysdale (Macmillan).—The Pathology of Mind: Dr. H. Maudsley (Macmillan).—Notes on a Journey on the Upper Mekong, Siam: H. W. Smyth (Murray).—Das System der Übergewalt oder das Analytisch-Synthetische Princip der Natur: K. Beyrich (Berlin, Oppenheim).

PAMPHLETS.—Revue de l'Aéronautique, 1893, 3<sup>e</sup> Livr.: Le Travail Intérieur du Vent: S. P. Langley (Paris, Masson).—Tableau Economique: F. Quesnay (Macmillan).—Philosophical Transactions of the Royal Society of London, Vol. 185 (1894) A, pp. 93–121: Propagation of Magnetisation of Iron as affected by the Electric Currents in the Iron: J. Hopkinson and E. Wilson (Dulau).

SERIALS.—Brain, Part 69 (Macmillan).—Royal Natural History, Part 16 (Warne).—English Illustrated Magazine, March (198 Strand).—London Home Monthly, March (Cox).—Journal of the Royal Microscopical Society, February (Williams and Norgate).—Good Words, March (Isbister).—Sunday Magazine, March (Isbister).—Chambers's Journal, March (Chambers).—Longman's Magazine, March (Longmans).—Le Monde Moderne, February (Paris, Quantin).—Century Magazine, March (Unwin).

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