A. C. Abbott to succeed Dr. Billings in the chair of Hygiene in the University of Pennsylvania; Dr. Franz Hofmeister to succeed the late Prof. Hoppe-Seyler as Professor of Physiological Chemistry in Strassburg University; Prof. P. Jacobsohn to be General Secretary of the German Chemical Society; Drs. Josse and Kämmerer to be Professors of Engineering in the Technical High School of Berlin; Prof. Schmidt, of Stuttgart, to be Director of the Weather Bureau at Würtemburg.

THE Technical Education Committee, in their report to the recent meeting of the Nottinghamshire County Council, called attention to rather an unlooked-for difficulty which had presented itself in connection with their Dairy Institute. It appears that the butter made there is in such request that they had a demand for 1000 lbs. per week, and were actually producing as much as 500 lbs. in this period. The temptation is to convert the institute into a butter-factory, and so into a money-making concern; but the Council supported the Committee in their recommendation that it would be altogether inadvisable to sacrifice the educational interests of the institution to such pecuniary considerations, and that, as in the past, the first aim of the staff must be the instruction of the students.

IT may be thought that the experimental stage in the administration of the Customs and Excise grants to education has been passed, but recent reports seem to negative this idea. The Lancashire committee report that they have been able to allot only eight out of ten science scholarships, the candidates showing a greater preference for the study of art. The Organising Secretary for the Lindsey division of Lincolnshire tells of 868 candidates for technical examinations this year as compared with 1012 last year. We hope that this does not mean that the novelty is wearing off, and that the serious demand for instruction of this kind is really less than had been anticipated. However this may be, there can be no doubt of the wisdom of the grant of £150 by this Council to the Nottingham University College for the year 1896-7.

AT the recent general meeting of the Association of Directors and Organising Secretaries for Technical and Secondary Education the following resolutions were adopted: (1) "That, in the opinion of this Association, it is desirable to ask the Government to receive a deputation to urge upon them the importance of bringing in a Bill early next session dealing with the subject of Secondary Education." (2) "That it is inexpedient to give grants to any non-county borough for building or equipment except upon the terms that such grants shall be returned in the event of such borough becoming a separate educational authority." (3) "That this Association protests against the action of the Science and Art Department in making changes in its grants and regulations for the conduct of its classes without giving due notice to or consulting the local authorities who are so vitally interested in the efficiency of these classes, and particularly urges that the regulations contained in Form 306 be postponed until the issue of the Directory for 1897-98."

THE Organising Secretary for Technical Instruction in the county of Shropshire, in reporting a diminution in the amount of work done in different parts of the county during the past session, observed that it "is ascribable to the vote of the Council in May 1894, by which the fund for technical instruction was reduced to the extent of £3000." This lessening of the grant has been more particularly felt in the towns where the best work was being done by science and art committees. The interruption of a systematic course of training is not, he finds, so serious in rural districts. The diminution complained of is the more to be deplored since already it has been found that the work of the Committee has been productive of practical results, particularly in the ornamental iron and tile manufactories and in the china works of the county. We notice that this Council has provided for the training at suitable institutions of six women as certificated midwives, and that the women have been selected with the view to their being able to follow the calling in parts of the county where there is most need for the services of such skilled nurses.

THE County Committees in charge of technical instruction will do well to take notice of the letter received from the Science and Art Department by the Clerk of the Cornwall County Council, which decides a point of some interest. The letter, which is in reply to a query from the Clerk, runs as follows:—"I am directed to acquaint you that the Department, having already consulted the Local Government Board on the question of the provision of prizes by local authorities, is of opinion that the Cornwall County Council cannot properly apply funds placed at their disposal for the purposes of technical education to awarding prizes (through the medium of local committees) at competitions in agricultural processes to persons other than those who have been taught in classes under the control of, or aided by, the County Council." This decision will prove very salutary, we should think, in view of some of the claims which have been made; for instance, from some districts payments for luncheons, refreshments, ale, spirits, &c., have been demanded—things we should have thought nobody would have supposed connected with technical education.

SCIENTIFIC SERIAL.

Ciel et Terre of July 16 contains an article by M. A. Lancaster, of the Royal Observatory of Brussels, on the intensity of tropical rainfall. There are many points in that zone where the yearly rainfall exceeds 120 inches; such amounts clearly indicate more or less continuous falls of great intensity. The author quotes various excessive amounts observed in periods of twenty-four hours and less, but we extract only a few of the principal falls, reduced to a period of one minute and expressed in inches:—Hong Kong, ·047; Buitenzorg, ·049; Newcastle (New South Wales), ·071; Lahore, ·095; Brussels, ·114; London (Camden Square), ·167. These figures show that the falls of rain in the tropics are not more intense than the extraordinary falls in our own parts, but the former generally exceed the latter in duration; hence the much greater absolute quantity recorded in equatorial regions.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, August 3.—M. A. Chatin in the chair.—Study of the diamond-bearing sands of Brazil, by M. H. Moissan. From 4·5 kilos. of sand, only 2 gr. of material free from silica was obtained, and this was found to contain a small quantity of gold, platinum and graphite, together with a minute amount of diamond, partly black and partly transparent.—On the oxidation of the organic material of the soil, by MM. P. P. Dehérain and E. Demoussy. At temperatures slightly above 100° the organic material of soil is rapidly burnt by the oxygen of the air. This oxidation still goes on, without any organisms being present, at 40° to 60° C., and hence in hot climates the soil would become sterile from this cause.—On a hybrid from *Ovis tragelaphus*, by M. A. Milne-Edwards.—An extension of the application of the law of equivalence of energy in biology, by M. A. Chauveau.—Remarks on a note of M. A. Lœwy on definite quadratic forms, by M. L. Fuchs. The theorem in question is a special case of a theorem given in a memoir published in the *Sitzungsberichte* of the Berlin Academy.—The conditions under which the deposits of phosphate of lime have taken place in Picardy, by M. Gosselet. It is regarded as established that these phosphatic deposits were formed at very slight depths.—On the integration of simultaneous partial differential equations, by M. E. von Weber.—On a class of isothermal surfaces depending on two arbitrary functions, by M. A. Thybaut.—On the error of refraction in geometric levelling, by M. Ch. Lallemand. The formulæ given in a preceding paper are for practical purposes given in a graphical form.—On the non-refractibility of the X-rays by potassium, by M. F. Beaulard. A prism of potassium gave no appreciable deviation of Röntgen rays, the index of refraction differing from unity by a quantity less than 1/10,000.—Nitrogen and argon in fire-damp and in gas from Rochebelle, by M. Th. Schlœsing, jun. The gas left after removal of methane and carbon dioxide, consisting of argon and nitrogen, on absorbing the latter gave amounts of argon varying from 1·09 per cent. to 3·27 per cent. of the mixture. These figures show that this argon does not come directly from the air, but it is still possible that it may have come indirectly by solution in water, in which argon is the more soluble.—On the specific heat of sulphur in the viscous state, by M. J. Dussy. The specific heat of viscous sulphur is distinctly higher in the viscous than in the liquid state. If the total quantity of heat lost by 1 gr. of sulphur in passing from a temperature T to 0° C. is plotted against the temperature, there is a distinct change of curvature at about 230° C.—Contributions

to the analytical characters of the compounds of tungsten, by M. E. Defacoz. The tungsten compound is converted into a tungstate, heated with some $KHSO_4$ and a little sulphuric acid, and a drop of this, added to such reagents as phenol, naphthol, morphine, &c., when characteristic colour reactions occur. Of these the red coloration with phenol, and the violet with hydroquinol, are the most sensitive and distinctive.—On the action of aluminium chloride upon benzene containing thiophene, by M. Eyvind Boedtker. Hydrogen sulphide is evolved, and the bulk of the thiophene is destroyed.—On some new mixed trimethylene compounds, by M. L. Henry. The new substances described are α-iodo-ω-chloro-propane, $CH_2Cl.CH_2.CH_2I$; and the corresponding nitro-derivative, $CH_2Cl—CH_2.CH_2.(NO_2)$.—The rapid estimation of the constituents of a mixture of primary, secondary, and tertiary amines, having the same fatty alkyl group, by M. Ch. Gassmann. The mixture is titrated with hydrochloric acid, and then with sodium nitrite in acid solution; the solution of the resulting simultaneous equations gives results of sufficient accuracy for industrial purposes.—On the compounds oxidisable under the influence of the oxidising ferment of mushrooms, by M. Em. Bourquelot.—On the hybernation of the *Clavelina lepadiformis* (Müller), by MM. A. Giard and M. Caullery.—Treatment of experimental infections by intravenous injection of a solution of common salt (0·7 per cent.), and their mode of action, by MM. F. J. Bosc and V. Vedel.—On the nature of the "Chabins," by M. Ch. Cornevin. The Chabin (so-called by Gay) of Chili is not a hybrid, but a species of sheep.—Chemical study of low-class flour used in baking, by M. Balland.—On the proximate composition of the gluten of cereals, by M. E. Fleurent.

AMSTERDAM.

Royal Academy of Sciences, June 27.—Prof. van de Sande Bakhuyzen in the chair.—Mr. C. Eykman presented for publication in the Academy's *Transactions* a paper on the respiratory gas interchange of the inhabitants of the tropics. The principal result of the experiments made at Batavia with Geppert and Zuntz's apparatus, on persons in a state of rest was, that both the European and the Malayan inhabitant of the tropics, the weight of their bodies being reduced to the same standard, use the same quantity of oxygen, and consequently produce the same amount of heat, as the inhabitant of the temperate zones, to whom the same test has been applied. Moreover, the ratio of the quantity of carbonic acid exhaled to that of oxygen inhaled by Europeans, is pretty much the same in India as in Europe; with Malayans the amount of carbonic acid exhaled is comparatively a little greater, which is accounted for by the food of the latter being richer in carbohydrates.—Prof. van Bemmelen communicated the result of an investigation into the proportion of fluorine in the fossil bones from the Pliocene formation in Middle-Java (Dubois' collection), which proportion was determined by the author in co-operation with Mr. Klobbie. He also treated of the coefficient of distribution in the absorption of dissolved substances by colloids.—Prof. van de Sande Bakhuyzen dealt with the determination of the error of projection in the case of Repsold's instrument for measuring photographs of stars.—Prof. Kamerlingh Onnes presented a continuation of his observations on the measurement of low temperatures.—Mr. Verschaffelt described measurements of capillary ascents of liquid carbon near the critical temperature. In his thermodynamic theory of capillarity, Prof. van der Waals has calculated, on theoretical grounds, the surface energy of a liquid near the critical temperature. He arrives at the conclusion that, at least if the temperature is very nearly critical, it must be possible to represent the surface energy by the formula, $\sigma = A(1-m)\,3/2$, in which A is a constant, and m the reduced temperature. The values of σ, deduced from experiments made by de Vries, and by Ramsay and Shields, may now be represented by a formula $\sigma = A(1-m)^B$, in which B is generally constant and smaller than 3/2, though in a few cases it gradually increases, in proportion as the critical point is approached. It was, therefore, desirable to measure some ascents, when the temperature was still nearer the critical point; and liquid carbonic acid was selected for this investigation. Up to 30° the change of the height of ascent is pretty nearly linear; for a capillary of a radius $r = 0{\cdot}0441\ m$M, it was found that

$$Hm\text{M} = 26{\cdot}04 - 0{\cdot}825\ t.$$

As this line cuts the temperature axis at 31°·6, and as the critical point, where H must be = 0, was found to be 31°·0, the "height-of-ascent" curve must incline a little towards the temperature axis between 30° and 31°, which was actually observed. For the calculation of the surface energy the liquid and gas densities determined by Amagat were used. Cailletet and Mathias have constructed parabolic formulæ for those densities, from which follows, it would seem, $\int v - \int d = k\sqrt{1-m}$. According to van der Waals this relation must be theoretically satisfied, at least near the critical temperature. When the quotient

$$\Delta \log \left(\int v - \int d\right) / \Delta \log (1-m)$$

is now deduced from the densities, given by Amagat, then it appears that up to about 30° it remains pretty nearly constant, the mean being 0·367, consequently smaller than the value derived from Cailletet's and Mathias's formulæ; above 30° it rises and reaches the value 0·521, in accordance with the theory. As regards $\Delta \log \sigma / \Delta \log (1-m)$, which, according to van der Waals, must become equal to 1·5 in the immediate proximity of the critical temperature, the calculation shows that this quotient becomes smaller up to 29°, but then it increases again, the maximum found being 1·512.—Prof. Engelmann communicated the result of investigations into the origin of the normal movement of the heart, from which it appears that very probably it is not of a neurogenic, but of a purely myogenic nature.—Prof. Franchimont presented, on behalf of Dr. P. van Romburgh, of Buitenzorg, a paper on the action of iodine upon potassium cyanide, and of iodine cyanide upon caustic potash, in which it is proved that the opinion that iodine cyanide behaves differently from potassium, from bromine- and chlorine-cyanide, is founded on an error, which has probably originated in not awaiting the end of the reaction, on making the experiments. After twenty-five minutes the final products are: at 25°, potassium isocyanate and potassium iodide; they are also obtained by adding iodine to an alkaline potassium cyanide solution, when for a moment the smell of iodine cyanide is observed. The concentration seems not to have any influence upon the result, but it has upon the rapidity of the reaction.

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