

in the optional science course prescribed by the Code of the Education Department, except that the Queen's Scholarship examination is to be limited to the elementary stage of physiology prescribed in the syllabus of the Science and Art Department. With regard to the college course the recommendation is singularly weak, science being placed as an optional subject, without any definite course of study prescribed. For the first two years it is laid down that of the optional subjects not more than two must be taken out of a list of four or six respectively, some of which from their very nature are almost sure to be taken in preference.

An important letter has been addressed to the Right Hon. Sir John Gorst by Sir Philip Magnus, the Chairman of the Joint Scholarship Board, in conjunction with the Chairmen of its four educational committees. They point out the necessity of securing the proper training of those who will be teachers of scientific subjects, and that the instruction of pupil teachers in science is now often carried on, under great pressure, by a system of cram, and even by persons who have not themselves any satisfactory knowledge of modern scientific methods. They suggest as a remedy that the first part only of the elementary stage, physiography, be compulsory; that the teaching of this subject be recognised only where it is given with proper accessories, all pupils performing the experiments in a series of at least twenty-four lessons of two hours' duration; and that inspectors should be required particularly to report whether proper apparatus and accessories are provided.

In last year's report your Committee referred to what Mr. Heller was doing in respect of the teaching of science in the schools of the London School Board. He has since obtained a better appointment at Birmingham, but the syllabus of lessons which he prepared is still employed in the schools. This of course requires that the masters and mistresses should be qualified for carrying it out, and for this purpose classes of twenty-four hours are conducted for their benefit by the science demonstrators. These gentlemen have lately agreed upon two separate syllabuses for masters and mistresses, which follow in general the scheme they are expected to teach to their scholars. The classes of a similar kind that have been carried on hitherto have been appreciated by the teachers, and the Board are increasing their laboratory and other accommodation for the purpose. It is recognised that it will be necessary to continue these teachers' courses for some years, in order to overcome the difficulty which now exists in consequence of the general want of practical experiment in such instruction in science as has been given in the course of training of most class teachers.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The 194th meeting of the Junior Scientific Club was held in the Physiological Lecture Room of the Museum at 8 p.m. on Wednesday, November 16. After the election of new members, Mr. A. F. Walden (New College) brought forward his motion respecting the appointment of a Committee to act with the Treasurer of the Robert Boyle Lecture Fund. The motion was carried, and the Club elected Mr. A. E. Boycott (Oriol) and Mr. A. S. Elford (St. John's) to serve on the Committee. Mr. A. D. Darbishire (Balliol) read a paper on natural selection among Lepidoptera. His remarks were illustrated by several cases of butterflies. Mr. J. E. Marsh (Balliol) followed with a paper on the constitution of camphor, in which he attempted to survey all the recent work on the subject.

MR. ERNEST WILSON has been appointed professor of electrical engineering at King's College, London, in succession to the late Dr. John Hopkinson.

DR. GIUSEPPE SANARELLI, of the Uruguayan Medical School and Director of the Hygienic Institute at Montevideo, whose discovery of the microbe of yellow fever has brought him much distinction, has, the *Lancet* states, been offered by Dr. Baccelli (Minister of Public Instruction) the chair of Hygiene in the University of Bologna, left vacant by Prof. Roncati.

THE two first formal steps towards the establishment of a Midland University, to be called the University of Birmingham, were taken on Friday last, at a meeting of the Court of Governors of Mason University College. In reference to the

scheme, the Management Committee reported that, in their opinion, the University to be established in Birmingham should be a teaching University, as distinguished from a University which only examines students for degrees. The University should therefore have the control and direction of all the teaching as well as the examining of students. With this end in view the Committee recommend that, if an agreement can be made with the governors of Mason University College, the University should be allowed to absorb the college. In this case the college would cease to exist as a separate institution, and its endowments, buildings, equipment, and staff would be transferred to the University. The Committee have had under consideration the financial position of the University. They are of opinion that, in order to completely carry out the above scheme, an endowment of not less than 200,000*l.* is required beyond that already held by Mason University College. Such an endowment would just double the present endowment of the college. The Committee expressed their opinion that every effort should be used to at once increase the endowment fund in order that an endowment of not less than 200,000*l.* may be obtained to enable the University to start under favourable conditions.

Mr. Chamberlain moved the two resolutions, one recommending that steps be taken to absorb and include Mason College in the new University; and the second, authorising the Council of Mason College to take the necessary measures to obtain a Royal Charter for the establishment of the University. In presenting these resolutions Mr. Chamberlain remarked: "I think our ideal may be stated in a few words to be the creation in Birmingham of a great centre of universal learning, of an institution which should provide for the intellectual cultivation of mind in the broadest possible sense, and which shall maintain for ever in the city the highest standard of intellectual eminence. We desire that in this school all acquired knowledge should be taught and explained, and we further desire that knowledge should be advanced by original research, and by the willing co-operation of those who are engaged as professors and teachers. The enormous development of science requires undoubtedly an extended application of the means of instruction. Of course, there is special reason why science should take a very prominent place in connection with a University which is situated in the centre of a manufacturing and commercial district, and it would, in my opinion, be pedantry were we to pretend that we did not attach the highest importance to this branch of our work, and did not intend that it should be distinctly carried out and should give to the University a special position of its own."

REFERRING to the address delivered by Mr. Chamberlain on the subject of a University of Birmingham, and referred to above, the *Times* remarked on Monday: "Those who carefully study German commercial methods are well aware that the chief cause of German success at the present time is the German manufacturers' respect for science. There is at the present moment at Düsseldorf a chemical company which employs thirty-three trained chemists, picked University men, who are paid good salaries with a share of the profits due to any invention which they may make; this company pays very high dividends, and its business has increased by leaps and bounds. It would be interesting, but not encouraging, to learn what has been the parallel history of the chemical works on the Tyne. This points to one way in which a Birmingham University, properly equipped, worked and encouraged, may affect the commercial prosperity of the city."

SCIENTIFIC SERIALS.

Wiedemann's Annalen der Physik und Chemie, No 10.—Gravitational constant and mean density of the earth, by F. Richarz and O. Krigar-Menzel. The gravitational constant, *i.e.* the constant which has to be inserted in the equation for determining the attraction from the product of the masses and the inverse square of their distance apart, when C.G.S. units are chosen, was found by the method of weighing a mass at two different altitudes above the earth's surface. The result arrived at was 6.685×10^{-8} . The value for the mean density of the earth was 5.505 ± 0.009 .—Surface tension in narrow capillary tubes, by P. Volkmann. When measurements are made on freshly-drawn capillary tubes, the results are well in accordance with the known laws, whatever the substance and diameter of the tubes. In old and wide tubes the surface tension is higher

by 0.02 mgr./mm., probably owing to the absence of solubility of the substance of the older specimens of glass.—A method for determining the thermal conductivity of solids, by F. A. Schulze. A rod of the material examined is at the temperature of the room. At a short distance from one end a thermo-couple is inserted. From a given instant, the end surface is exposed to a stream of water at a different temperature. Knowing the specific heat of the body, the author works out in detail an equation for finding the thermal conductivity, and illustrates it by examples which show a maximum error of 4 per cent.—Specific heats of metals at low temperatures, by U. Behn. If the decrease of the specific heat with the temperature is represented graphically, it appears probable that all the curves intersect at the temperature of absolute zero. At that temperature it is also possible that the specific heats themselves are zero. In any case, Dulong and Petit's law does not hold for low temperatures.—Cohesors, by E. Aschkinass. The theory of the coherer according to which the decrease of resistance is accounted for by sparks which weld the particles temporarily together, does not suffice for the case of peroxide of lead, where the resistance increases under the influence of electric waves. The coherer action pure and simple is only observed under feeble electric radiation. When the latter is strong, disturbing influences supervene.—Electrical and thermal measurements made on discharge tubes, by E. Wiedemann and G. C. Schmidt. When the appearance of discharge tubes is similar, whether they are fed by an influence machine or a continuous current, it is safe to assume that the potential gradients are the same. The values of the potential gradient as derived from probes and from calorimetric measurements respectively are the same, but the latter method is more suitable when the discharge is discontinuous.

Bollettino della Società Seismologica Italiana, vol. iv., 1898, Nos. 2, 3.—Echo in Europe of the Indian earthquake of June 12, 1897, by G. Agamennone.—Seismoscope with multiple effect, by A. Cancani.—The earthquake of Grandson [February 22, 1898], by F. A. Forel, a paper (in French) describing a series of short waves, about half a metre in height, which were observed on the lake of Neuchâtel at the time of this earthquake.—On the various systems of registration in seismology, by A. Cancani.—On the Rieti earthquake of June 28, 1898, by G. Brucchiotti. An account of the damage caused by this earthquake at Rieti and elsewhere.—Notices of earthquakes recorded in Italy (July 27–September 17, 1897), by G. Agamennone, the most important being the earthquakes of Japan on August 4–5, Turkestan on August 15 and September 17, and Tuscany on September 6, and earthquakes of unknown, but distant, origin on August 6, 13, 16, 20 and 26.

SOCIETIES AND ACADEMIES.

LONDON.

Entomological Society, November 2.—Mr. G. H. Verrall, Vice-President, in the chair.—Mr. Merrifield exhibited some *M. aurinia* from Touraine forced and cooled as pupae, the latter being much the darker and more strongly marked, some *E. cardamines* from Sussex, those cooled having the apices of the wings darker and the discal spots smaller than those which have been forced, and some *C. edusa* from eggs laid by two normal females taken in Savoy, two out of the five reared being of the var. *helice*; the marginal border of one male, which had been forced, was very pale and much suffused with long yellow scales. He also showed four *P. machaon*; two of them, forced as pupae, had their dark parts very pale and their tails long and slender, the two which had been cooled having the dark parts much extended in area and darkened in hue, their tails being short and broad. These results, which were to be obtained with winter as well as summer pupae, corresponded with those previously obtained by Dr. Standfuss.—Mr. J. J. Walker exhibited two winter nests of *Porthesia chrysorrhoea* from the Isle of Sheppey, where the species had lately become very common.—Dr. Mason exhibited a Buprestid larva found among Baltic timber at Burton-on-Trent. This had been among wood in a box since the beginning of July last, and there was scarcely a trace of frass. Marsham had recorded the escape of a larva of *Buprestis splendens* from the wood of a desk in the Guildhall, which had stood there for more than twenty years. It is probable that the growth is extraordinarily slow, and consequently that the larva can maintain life for very long periods

in most unfavourable conditions.—Mr. Blandford called attention to similar cases which he had brought before the Society. It appeared likely to him, from what was known about such insects as *Callidium variabile*, which was occasionally bred from dry wood at long intervals, that these species were not abnormally slow-growing under normal conditions, but became so in dry timber, in which they probably sustained life with difficulty, especially when the outside of the wood was varnished.—Mr. Waterhouse exhibited for Mr. G. W. Kirkaldy living examples in various stages of a *Caryoborus* in nuts of *Attulea funifera* from Brazil. Elditt had described the attacks of an allied species upon the seeds of *Cassia fistula*.—Mr. Tutt exhibited for Dr. Chapman a series of Swiss examples of *Zygaena exulans*, and discussed the differences between them and the Scotch form.—Papers were communicated by Mr. W. F. H. Blandford on some Oriental Scolytidae of economic importance with descriptions of five new species, and by Mr. van der Wulp (through Colonel Yerbury) on Asilidae from Aden and its neighbourhood.

Linnean Society, November 3, Dr. A. Günther, F.R.S., President, in the chair.—The President exhibited an abnormal twin tusk of an adult Indian elephant, and made the following remarks. The tusk occupied the right jaw of the animal. The two teeth were developed from separate papillae and remained perfectly separate, without any connecting ossification, although they grew side by side from the same socket, the uneven surface of one closely fitting into that of the other. He was inclined to look upon the smaller tooth as a persistent milk-tooth, which, not being shed, continued to grow from its original papilla; but Mr. Charles Tomes, F.R.S., considered it a case of duplication, such as is sometimes found in man and other mammals, in which the development of two separate papillae gives rise to a twin tooth of the permanent dentition. No such case seems to have been previously observed in the elephant.—Prof. G. B. Howes, F.R.S., exhibited some young and six living eggs of the New Zealand lizard *Sphenodon (Hatteria)*, received from Prof. A. Dendy, of Christchurch, N.Z., part of a full series which had furnished that gentleman with material for a monograph on the general development of the animal, now in course of publication. Briefly referring to the previous attempt of Parker and Thomas to secure material for the study of this subject, he said that the palaeontological discoveries of Credner justified us in regarding the Rhynchocephalia as the most central among terrestrial vertebrata. He remarked that the specimens had been sent him for the express purpose of working out the development of the skeleton. Recapitulating the more salient discoveries recently announced by Prof. Dendy in his preliminary paper in the *Proc. Royal Soc.* and elsewhere he said, in comment upon them, that the plugging of the nostrils by cellular tissue during development is a phenomenon already described by the late T. J. Parker in *Apteryx*, and that it appeared to him akin to that of the occlusion of the oesophagus of the vertebrate embryo first described by Balfour, which De Meuron had sought to associate with the metamorphosis of the branchial diverticula. He pointed out that Dendy's discovery of a third pair of incisors was confirmatory for the upper jaw of the conclusions of the late Dr. G. Baur, and remarked that he had received a letter from Prof. Dendy, dated September 12, stating that he and his colleagues at the Antipodes had secured a Government order protecting the eggs as well as the young of *Hatteria*.—Mr. A. F. Crossman exhibited some photographs illustrating the case of a chicken hatched and reared by a common buzzard. The buzzard had laid an egg in captivity, and manifesting a desire to incubate, a hen's egg was substituted, which in due course was hatched and the chicken reared, the foster-parent feeding it upon morsels of flesh. It thus appeared that in a conflict of instinct, under altered conditions of life, the maternal instinct had proved stronger than the natural impulse to kill and devour weaker prey. Mr. J. E. Harting remarked that the case was not an isolated one, instances of buzzards rearing chickens having been previously recorded (*Zool.*, 1881, p. 103), as well as several cases of eagles hatching goose-eggs and rearing the goslings (*NATURE*, April 1879, and *Field*, February 1896).—Messrs. H. and J. Groves exhibited specimens of *Nitella hyalina*, Agardh, a new British plant, and made some remarks on its affinities and distribution. Mr. W. Carruthers, F.R.S., and the President made some observations by way of comment.—Prof. H. Marshall Ward, F.R.S., read a joint paper by Miss Dale (Pfeiffer student of Girton College) and himself on *Craterostigma pumilum* (Hochst.), a rare plant