

isolation, or to lack of opportunity, but to native inability and to the mating of defective with defective. (c) Individual immigrants of high potentiality tend to marry with the better native stocks, while those of low potentiality gravitate towards inferior native stocks. The whole history emphasises the usefulness (a) of segregating the markedly defective, (b) of some colonisation scheme, together with sterilisation, for certain types of the socially unfit, and (c) of some expert board of control with authority to prohibit marriages of a cogenic sort. There is danger in ameliorative methods which allow the markedly unfit to multiply and counteract natural agencies for the selection of fit strains. More positively, public opinion requires to be educated towards a keener realisation of the possibilities of establishing strong strains of efficient citizens.

University and Educational Intelligence.

CAMBRIDGE.—Mr. R. A. Fisher and Mr. A. R. MacLeod have been elected to fellowships at Gonville and Caius College, and Mr. R. O. Street, Mr. W. H. Bruford, and Mr. G. E. Briggs to fellowships at St. John's College.

LONDON.—A course of nine lectures on "A Historical Review of Meteorological Theory" will be given at the Meteorological Office, South Kensington, S.W.7, by Sir Napier Shaw, reader in meteorology in the University, on Fridays at 3 p.m., beginning on January 21 next. The course is intended for advanced students of the University and others interested in the subject. Admission is free by ticket, to be obtained on application to the Meteorological Office, South Kensington, S.W.7.

The informal meetings at the Meteorological Office for the discussion of important current contributions to meteorology, chiefly in Colonial or foreign journals, began on Monday, November 1, and will be continued on alternate Mondays, with the exception of December 27, until March 21, 1921.

DR. A. FULTON, hitherto lecturer on engineering in Dundee University College, has been appointed to the chair of engineering in the same institution.

THE Cambridge University Calendar for 1920-21 has been published by the University Press, price 20s. The volume contains lists of University officials, professors, lecturers, etc., and the regulations for prescribed courses, degrees, and prizes. The Tripos lists from 1911-20 are given, and also the list of degrees conferred during the year 1919-20. Some three hundred pages are devoted to notes on the individual colleges, which give all the essential information about the constitution of these bodies, the regulations for admission, scholarships, etc., together with the lists of fellows, graduates, and undergraduates attached to them. The volume is supplied with a general index, and also with a complete index to members of the University.

THE Calendar for the session 1920-21 of University College, University of London, has been received. In it will be found complete details of all the faculties of which it is composed, together with time-tables for all the courses provided and lists of the scholarships, prizes, etc., available. There is also an account of the assembly held on July 2, when the American Ambassador, Mr. John W. Davis, took the chair. The Provost of the college made his report for the session 1919-20, and mentioned that during that period the college had been the recipient of two gifts from the United States: one of 1,250,000l. from the

Rockefeller Foundation for the promotion of medical research, and another, a collection of books on American literature, history, and institutions, from the Carnegie Endowment for International Peace. Other benefactions which were mentioned included a gift of 10,000l. from Lord Cowdray for the extension of the engineering school, and a grant from the Carnegie United Kingdom Trust which had made it possible to institute a school of librarianship.

DETAILS of the French Budget for 1920 are given in the *Fortnightly Survey of French Economic Conditions* of September 1. For the Ministry of Public Instruction and Fine Arts a sum of 1,067,328,770 francs is provided which will be allotted in the following way: For public instruction, 994,335,476 francs; for the fine arts, 44,008,800 francs; and for technical instruction, scholarships, etc., 28,984,494 francs. Of a total of 3,280,247,620 francs provided for the Ministry of Public Works, 128,650,830 francs is devoted to section 11, which deals with aeronautics and aerial transportation. In the section of the Budget dealing with extraordinary expenditure which is not provided for by taxation the Ministry of Public Instruction and Fine Arts is credited with a further sum of 109,175,400 francs. The Ministry also receives 129,762,000 francs for the reconstruction of schools, etc., which will be recovered under various peace treaties which have been signed; while the Ministry of Agriculture will be credited with 5,812,000 francs from similar sources for the purposes of reforestation and the reconstruction of fences protecting State forests.

TEACHERS' Leaflet No. 9 of the Bureau of Education, Washington, illustrates the earnest endeavours now being made in the United States to place instruction in civic rights and duties upon a firm foundation. The leaflet, prepared under the direction of the Bureau's specialist in civic education, describes a series of lessons in civics for the three primary grades of city schools. Each lesson is based upon some situation of civic significance in which the child is normally to be found. The typical situations include: Riding in public conveyances; visiting public places; an accident; a fire drill; arrival of a new pupil or visitor to the school; the walk to school; the arrival of the mail; and contact with a sick person. In conversation style the children are led to give their observations and experiences, and through the teacher's interpretation and enlargements the civic significance is induced. The syllabus is replete with suggestions, dramatisation without material being especially recommended. Similar situations are dealt with in each grade, the instruction being cumulative and concentric. The proposed enlargement of the syllabus and its adaptation to the requirements of the intermediate higher grade will constitute an interesting and important experiment in civic training.

THE Department of Aeronautics in the Imperial College of Science and Technology announces an extensive series of lectures for the year 1920-21. Two full-time courses have been arranged: (1) Design and Engineering and (2) Meteorology and Navigation. The former course includes lectures on aerodynamics by Prof. Bairstow, with practical class-work under his direction; a special course of mathematics for students of aerodynamics; design lectures and drawing-office work under Prof. Bairstow and Mr. F. T. Hill; and lectures on the construction and strength of aircraft by Mr. A. J. Sutton Pippard. Engine design is dealt with by Mr. A. T. Evans, the theory of the internal-combustion engine forming the subject of a series of lectures by the director of the department, Sir Richard Glazebrook. A special

course of meteorology and navigation for students principally concerned with aerodynamics is being given by Sir Napier Shaw, while in the latter half of the session Wing-Comdr. Cave-Brown-Cave will lecture on airships. The full-time course on meteorology and navigation comprises a very detailed study of meteorology with special attention to its bearing on aeronautics. The work is under the control of Sir Napier Shaw, the late director of the Meteorological Office, with the assistance of Squadron-Leader Wimperis as lecturer on navigation. The whole programme for both courses is very well arranged, and as the services of such excellent lecturers have been obtained it is to be hoped that a sufficient number of students will be forthcoming to make the courses a success and to establish firmly this new department of the Imperial College.

Societies and Academies.

LONDON.

Royal Society, November 4.—Sir J. J. Thomson, president, in the chair.—Prof. **H. Lamb**: The vibrations of an elastic plate in contact with water. The chief problem considered is that of determining the gravest frequency of a thin elastic diaphragm filling an aperture in a plane rigid wall which is in contact on one side with an unlimited mass of water. This had an interest in connection with submarine signalling. An exact solution is not attempted, but a sufficient approximation for practical purposes is obtained by Rayleigh's method of an assumed type, which gives good results if the type be suitably chosen.—Prof. **H. M. Macdonald**: The transmission of electric waves around the earth's surface.—Lord **Rayleigh**: A re-examination of the light scattered by gases in respect of polarisation. II.: Experiments on helium and argon. The light scattered by helium and by argon is investigated. It is found in the case of helium that the total light scattered is in accordance with what would be expected from its refractivity. The polarisation in helium, contrary to what was found in 1918, is approximately complete. No intensity was detected in twenty-four hours of exposure in the component vibrating parallel to the exciting beam, and certainly this component was less than 6.5 per cent. of the other. Argon polarises much more completely than any other gas examined (with the possible exception of helium), the weak component being only 0.4 per cent. of the other.—Prof. **C. F. Jenkin**: Dilatation and compressibility of liquid carbonic acid. The paper describes the measurement of the dilatation and compressibility of carbonic acid between temperatures of -37° C. and $+30^{\circ}$ C. and up to pressures of 1400 lb. per square inch. The measurements were made to supply accurate data for determining the starting point for drawing the $\theta\phi$ and $I\phi$ diagrams and to replace the approximate results (known to be inaccurate) given in a former paper (Phil. Trans., A, vol. ccxiii., p. 76).—W. T. **David**: Radiation in explosions of hydrogen and air. This paper contains a record of the results of experiments on the emission of radiation during the explosion and later cooling of mixtures of hydrogen and air contained in a closed vessel. The results of experiments on the transparency of the exploded mixtures are also recorded. Some of the main conclusions arrived at are as follows: (1) The rate of emission is approximately proportional to the fourth power of the absolute mean gas temperature. (2) The maximum rate of emission occurs at the point of maximum temperature. (3) The exploded mixtures are very transparent throughout cooling to radiation of the same kind as

they emit. (4) The intrinsic radiance increases both with the lateral dimensions and with the thickness of the radiating layer of gas. (5) The 2.8μ band of steam ceases to be emitted when the gas temperature has fallen to about 700° C.—Dr. **R. E. Slade** and **G. I. Higson**: Photochemical investigations of the photographic plate. (1) It has been shown that the silver halide grain is the photochemical unit in the photographic plate. (2) A method has been devised whereby the law of photochemical behaviour of these grains can be investigated free from the disturbing effects of development, etc., which occur in the photographic plate itself. (3) From experimental results obtained a formula has been deduced which shows the relation between the behaviour of the silver halide grains, the light intensity to which they have been exposed, and the time of exposure. (4) The results show that it is impossible for the mechanism of the process to be the absorption of light in discrete quanta, and that a given amount of light energy has a greater effect photographically when concentrated into a short range of wave-lengths than when it is distributed over a large range.—Dr. **E. H. Chapman**: The relationship between pressure and temperature at the same level in the free atmosphere. The paper deals with the exceptionally high values contained in the table of coefficients of correlation between changes of pressure and changes of temperature at different levels in the atmosphere included in Geophysical Memoir 13 of the Meteorological Office, by W. H. Dines. The coefficients are computed for observations taken at random, and arranged in four groups for the year of three months each. For the layers between 4 km. and 8 km. these coefficients range from 0.75 to 0.92. It is assumed that if the observations were freed entirely from errors of measurement the coefficients would be still higher. A method is therefore worked out for correction of coefficients of correlation for probable errors of observation in measurement.—Prof. **J. C. McLennan**: Note on vacuum grating spectroscopy.

PARIS.

Academy of Sciences, October 18.—M. Henri Deslandres in the chair.—M. **Mesnager**: The applications of the Pitot tube. Remarks on the note in the last issue of the *Comptes rendus* by the late Yves Delage. It is pointed out that the three problems stated by him—transmission to a distance, independence of the experimental indications and of the support, and registration of the velocities—have already been solved, and the first two in a simpler manner. An account is given of the methods hitherto proposed, all of which would be difficult to use at sea.—M. **Hamy**: The photography of stars in full daylight. An account of some experiments carried out at the Observatoire des Bosses (altitude 4350 metres) on Mont Blanc.—H. and F. **Le Chatelier**: The mechanical properties of plastic bodies: the importance of reactivity. From a study of the torsion of glass kept at 550° C. and of steel at 825° C., it is shown that there are three kinds of deformation: an instantaneous elastic strain, which disappears on removal of the stress; a sub-permanent deformation, produced slowly and disappearing equally slowly; and, finally, a viscous deformation, produced with a constant velocity and not vanishing after release from stress.—M. **Le Prieur**: A route corrector: a new method of aerial navigation by estimation.—J. L. **de Olivar**: Correction of the lunar co-ordinates deduced from observations made at Montevideo of the annular eclipse of the sun of December 3, 1918.—E. **Belot**: The law of distribution of masses in the solar system, and the origin of the smaller planets.—A. **Véronnet**: Time and temperature