

July, 47 mm. (1.9 in.); and here also the winter, as a whole, is considerably rainier than the summer.

The other paper, "La Variazione Diurna della Temperatura a Catania e a Messina" (*Bollettino dell'Accademia Gioenia di Scienze Naturali in Catania*, fascicolo xlv., Luglio, 1918), shows that, excepting the months of June, July, and August, which have practically identical mean temperatures at Messina and Catania, ranging between 22° and 26° C. (72° to 79° F. *circ.*), the latter place is distinctly colder. The greatest difference is in January, when the mean for Catania is 9.5° C. (49.1° F.), and for Messina 11.6° C. (52.8° F.). The difference is attributed to the fact that for the major portion of the year Mount Etna, being snow-clad, exerts a chilling effect upon the air at Catania, rendered the more marked from the circumstance that the prevailing wind direction is N.W. at both places. Thus the wind at Messina blows straight in from the warm sea surface, but blows down on Catania from the snows of Etna. The mean diurnal range of temperature is greater at Catania in every month of the year except August, the greatest difference occurring in November. In this month the daily range is 5.1° C. at one place and 2.9° C. at the other, or a difference of 2.1°. The regulating action of the sea is thus more marked at Messina. At both places the diurnal range of temperature is small, but, as is very generally the case, greater in summer than in winter.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Lord Moulton, of Christ's College, honorary fellow of St. John's College, has been appointed Rede lecturer for the present year.

Mr. A. Hopkinson, of Emmanuel College, has been appointed additional demonstrator of human anatomy for five years.

Capt. J. T. Saunders, formerly junior fellow of Christ's College, has been elected to a senior fellowship, and Capt. C. G. Darwin, lecturer in mathematics at the college, to a junior fellowship. Capt. Saunders is University demonstrator of animal morphology, and Capt. Darwin was bracketed Fourth Wrangler in 1909.

OXFORD.—By the death of the late Provost of Oriel, Dr. C. L. Shadwell, the University has lost a well-known and characteristic figure. Though but slightly in sympathy with many of the movements and aspirations of present-day Oxford, Dr. Shadwell gained universal respect by the acutely legal turn of his mind, by his remarkable business ability, and by the devotion with which he threw himself into the public affairs of both University and city. A life-long advocate of education on a wide and general basis, he yet found time and opportunity to become a master in many departments of curious and specialised learning, often surprising his hearers by the sudden display of some unusual piece of erudition. These *dicta* were delivered with a characteristic incisiveness, and not without a suggestion of latent and kindly humour. Amongst his accomplishments was a wide and thorough knowledge of botany, which he turned to account as a curator of the botanic garden. For the last four years he had been living in retirement, but his loss will be deeply felt by his own college and by the University at large.

On February 18 a decree was introduced by the Warden of Wadham providing for the acceptance by Convocation of an offer by the trustees of the Christopher Welch benefaction to provide 450*l.* a year each for five years for a lecturer in clinical physiology and in economic zoology respectively. Mr. H. C. Bazett, fellow of Magdalen College, and Mr. N.

Cunliffe, Trinity College, Cambridge, were appointed lecturers, these being the first appointments made under the Welch bequest.

At the same meeting of Convocation the report for 1918 of the Committee for Rural Economy was presented, recording, amongst other items, that a farm of 355 acres at Sandford-on-Thames had been secured on lease for the purpose of providing facilities for experiments and demonstrations in connection with the work of the School of Agriculture and Forestry.

THE Regional Association—an organisation for the promotion of regional research—is arranging for a vacation meeting at Malvern from April 9 to April 16. All further particulars can be obtained from the hon. secretary, Mr. Geo. Morris, 7 West Road, Saffron Walden.

WE learn from the *Times* that at a meeting of the Edinburgh University Court, on February 18, a letter was read from the Treasury intimating that an advance of 7000*l.* by way of a grant from the Development Fund would be made to the University in aid of the endowment of a chair of forestry on the condition already accepted by the University—that the remaining 7000*l.* required was provided by the University from other sources. The Court resolved to institute a chair.

SIR ERNEST CASSEL has placed in the hands of trustees a sum of 500,000*l.* for the following educational purposes:—(1) The promotion of adult education in connection with the Workers' Educational Association or any other association or body approved of by the trustees. (2) The establishment of scholarships for the encouragement of the education of workmen or their sons and daughters. (3) The promotion of the higher education of women by the assistance of colleges for women. (4) The promotion of the study of foreign languages. (5) The establishment of a faculty of commerce in the University of London in such terms as may be approved by the trustees. The trustees are Mr. Asquith, Mr. Balfour, Miss Philippa Fawcett, Mr. H. A. L. Fisher, Lord Haldane, Sir George Murray, and Mr. Sidney Webb; their secretary is Mr. A. E. Twentyman, 6 Stanhope Gardens, Highgate, N.6.

ANNOUNCEMENT is made that the general committee of Lloyd's Register of Shipping will grant the following scholarships for the study of naval architecture and marine engineering:—Three scholarships in naval architecture at Glasgow, Durham, and Liverpool Universities, tenable for three years; three scholarships in marine engineering at the University of Liverpool, tenable for three years; and two scholarships in marine engineering in connection with the Institute of Marine Engineers, tenable for two years. The regulations governing the scholarships have been amended in order that the field of competition may be widened. Before 1915 five scholarships were competed for each year, and were of a value of 50*l.*; the committee has resolved to increase this amount to 100*l.*, and since no scholarships have been awarded during the past three years, and also that probably there will be a larger number of candidates offering themselves than has hitherto been the case, to authorise the grant of more than one scholarship to each institution for the present year, provided the authorities can recommend that such a course can be adopted with advantage. Full particulars of the qualifications and details of the subjects of examination can be obtained from the Secretary, Institute of Marine Engineers, 85-88 The Minories, Tower Hill, London, E.1.

In 1914 the Education Committee of the City of Coventry had made all arrangements for erecting a technical institute, which, with equipment, was estimated to cost 40,000*l.* The war prevented the scheme being carried out, and the expansion of the city during the war has been such that the scheme has had to be entirely rejected as inadequate. The site selected being too small, it was necessary to find another. There is every prospect of a better site being obtained, with the additional advantage that there will be ample provision for extensions when the necessity for these arises. The Education Committee has approached the Chamber of Commerce with the view of obtaining assistance to make the new technical college worthy of the city. The Chamber of Commerce has treated the proposal very sympathetically, and will probably give material help in providing for the cost of the equipment; 50,000*l.* is the sum mentioned. Messrs. Alfred Herbert, Ltd., have given an impetus to the scheme by a very generous gift of 5000*l.* towards the equipment, and it is confidently expected that the other firms in Coventry will be relatively as generous. It is gratifying to note that the manufacturers, as a rule, take a keen interest in the technical education of their employees, and the interest shown by the Chamber of Commerce will probably lead to active co-operation between the Education Committee and the manufacturers. It is estimated that the whole scheme will cost between 100,000*l.* and 120,000*l.*

At a meeting of the Committee for the Furtherance of University Education in South-West England, held at Exeter on January 27, a report was given of the recent deputation to the President of the Board of Education to urge the matter. The deputation sought for the approval of the Government for the scheme of a university for the South-West, which should comprise colleges at Exeter, Plymouth, Newton Abbot, and Camborne, each doing the type of work suitable to its own locality. No fewer than ninety-one publicly elected councils have supported the scheme, and more than 250 Labour organisations are in favour. In reply, Mr. Fisher pointed out that in the university proposed for the South-West it appeared that the several faculties were to be widely separate from one another. Mining would be located at Camborne, agriculture at Newton Abbot, engineering and marine biology, and possibly commerce, at Plymouth, and the humanities and pure science at Exeter. In regard to finance, he felt that it would be difficult to establish a first-rate university of the South-West with the funds which at present seemed likely to be available. The number of university students would depend upon the development of secondary education in the area from which the university would draw. The 10,000 pupils given as the number in the secondary schools of the area concerned might be expected to yield rather fewer than 700 university students, and with some 200 of these probably going to Oxford or Cambridge, there would scarcely be enough left to justify the creation of a South-Western University. He would be very glad to see a really effective university set up in the West of England, but at the present moment, and in view of existing circumstances, he did not think that there was a sufficient promise of students, teachers, or financial support to justify the establishment of a degree-giving body in the two western counties, and that before such a step could be properly taken a good deal of preliminary work had still to be accomplished, not only in the sphere of secondary education, but also in the development of the higher forms of education at both Exeter and Plymouth. With these views before it, the committee decided to direct the execu-

tive committee to invite representatives of the governing bodies of University College, Exeter, Seale-Hayne College, and the Cornwall School of Metalliferous Mining, as well as the education authorities of the South-West, to confer with them in regard to the prospects of the further development of such institutions.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, February 6.—Sir J. J. Thomson, president, in the chair.—A. Mallock: Note on the elasticity of metals as affected by temperature. The present note is an account of some preliminary experiments on the variations with temperature of Young's modulus for fifteen selected metals. The choice was influenced largely by the ease with which specimens could be procured. No alloys are included. The metals chosen were rhodium, platinum, iron, palladium, nickel, copper, gold, silver, magnesium, aluminium, zinc, lead, cadmium, bismuth, and tin. The procedure was to determine the frequency of the vibrations of a stiff rod carried at its lower end by a small thin plate of the material to be tested, the other end of the plate being clamped to a fixed support. The plate and its support could be immersed in fluid of any desired temperature without wetting the rod or in any way interfering with the mounting. The temperatures employed were those of liquid air, 0° Centigrade, ordinary temperature (10°–15°), and as near 100° C. as was practicable. The measured frequencies of vibration at these temperatures furnished the necessary data for determining the changes in Young's modulus. The results showed that the more infusible the metal, the less the modulus was affected for a given change of temperature, and this suggested that there might be a real connection between the variation of the modulus (M) and the melting point θ_m in Absolute temperature. A diagram is given comparing the experimental results with what they would have been had the relation $dM/d\theta = \theta_m$ been true. If this relation holds, and θ_1, θ_2 are two temperatures for which the moduli are M_1, M_2 , then would

$$M_1/M_2 = \frac{\theta_m - \theta_1}{\theta_m - \theta_2},$$

and if θ_1 is Absolute zero and $\theta_2 = 0^\circ \text{C.}$, then in this case $M_1/M_2 = \frac{\text{melting point Absolute}}{\text{melting point Centigrade}}$ for any two temperatures differing by 270° C. The experimental results show a distinct resemblance to those obtained on this supposition.—W. L. Cowley and H. Levy: Vibration and strength of struts and continuous beams under end thrusts. In a previous communication, "The Critical Loading of Struts and Structures," the authors investigated the stability of a strut under end thrust and simply supported at a number of intermediate points. The method of analysis has been extended in the present paper to include the more general problem of the vibration of such a system when the lateral load is periodic and the supports are assumed in a state of vibration. The flexural rigidity and the end thrust, constant along each bay, are taken for further generality to vary from bay to bay. These conditions correspond closely with those originated in a wing spar of an aeroplane when in flight and influenced by engine-throbbing. A very general form of the equation of three moments is derived, and the conditions for resonance and crippling are expressed in a convenient determinantal form. The general case where the end thrust, the flexural rigidity, and the mass per unit length vary between the supports according to any assumed law is discussed, and the method of solution illustrated in the particular case