

the work of the University is really a stupendous monument to activity in all departments of knowledge. We are only concerned with the volumes containing papers from the scientific laboratories, but even these are of far too elaborate a character to be described adequately in this short article. Five volumes have been received, which can only be briefly noticed. Two of these, edited by Prof. F. A. Gooch, contain records of researches carried on in the Kent Chemical Laboratory of Yale University from the opening of the laboratory in 1888 to the present time. In one volume there are fifty-nine papers, and in the other forty-nine, together with a systematic index, index of authors and index of subjects. A consideration of the more familiar phenomena of optics is given by Prof. C. S. Hastings in a volume on "Light," which ought to receive the attention of students of the subject. The laboratory of invertebrate palaeontology contributes a volume, edited by Prof. C. E. Beecher, on "Studies in Evolution," containing papers bearing on the investigation and study of the development of a number of invertebrate animals. The papers deal with the origin and significance of spines, structure and development of trilobites, development of the brachiopoda and miscellaneous studies in development. The fifth volume which has reached us is edited by Profs. S. L. Penfield and L. V. Pirsson, and it contains papers on the results of researches in mineralogy and petrography made in the Sheffield Scientific School of the University. The man of science needs no better evidence of the life and progress of a university than is afforded by volumes like these, which are published in New York by Messrs. Charles Scribner's Sons, and in London by Mr. Edward Arnold.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The president of Magdalen (Mr. T. H. Warren), who has always taken an active part in furthering the interests of science, has been elected a member of the Hebdomadal Council. Prof. Elliott has been elected a delegate of the University Museum.

CAMBRIDGE.—Dr. L. E. Shore, St. John's, has been re-appointed University lecturer in advanced physiology, and Mr. F. F. Blackman, St. John's, University lecturer in botany. Mr. H. O. Jones, Clare, has been appointed demonstrator in organic chemistry to the Jacksonian professor, in place of the late Mr. Spivey. Mr. C. Shearer, advanced student, Trinity, has been appointed to occupy the University table in the Naples zoological station.

MR. W. MAITLAND (Aberdeen) has been appointed junior demonstrator of chemistry at University College, Sheffield, in succession to Dr. T. S. Price.

THE Report of the work of the Examinations Department of the City and Guilds of London Institute again directs attention to the fact that the general education of a large number of students who enter the technological classes is still defective, and they are consequently unable to profit, as they should do, by the special instruction they receive. Insufficient knowledge of the elementary principles of science, and particularly of such subjects as mensuration, geometry and drawing, is a frequent cause of failure of students to pass the examinations in technology. The preliminary course of instruction, and corresponding examinations, arranged by the Institute, provides a partial remedy for this defect; and the recent announcement that the Board of Education is prepared to consider suggestions from schools for grouped courses of instruction in branches of science cognate to certain trade subjects should do something to decrease the number of candidates without a knowledge of scientific principles. The Institute's Examination Committee strongly recommend students to attend courses in geometry, mathematics and elementary science, prior to, or concurrently with, the study of technology and workshop practice. "Technical instruction," it is wisely remarked, "fails altogether of its purpose if the student does not understand the 'why' and the 'wherefore' of the operations he performs. The aim of such teaching as is given in technological classes is not to make expert workmen, but to show how difficulties may be overcome, and how skill in drawing and a knowledge of the principles of

science may, with sufficient practice, help to produce expert workmen. It is not the object of the Institute's examinations to test mere skill in workmanship. The craftsman's own work is the best certificate he can produce. But as evidence of training in the principles underlying the practice of his trade, the class certificate in technology has a distinct and recognised value."

THE current number of the *Record*, the organ of the National Association for the Promotion of Technical and Secondary Education, contains several interesting articles. Specimen lessons are given to show how interest in nature-knowledge may be encouraged, and how it may be assisted by Museums. It may be doubted, however, whether any useful purpose is served by creating an animistic attitude in the minds of children studying nature. The following statement, for instance, is, to say the least, misleading: "When the horse-chestnut feels winter coming on, it says to itself—you can hear the branches whispering during any autumn evening—'Dear me, my leaves will begin falling off in a minute, and there are those new leaves and things to see about in the spring; I must begin making buds this very instant.'" The child who is taught on these lines will believe that a hawthorn tree is really able to look ahead to a severe winter, and takes pains to provide plenty of haws for the birds during the forthcoming hard times.

THE funds available for purposes of technical education are the residue received under the Local Taxation (Customs and Excise) Act, direct aid from the rates, and grants from the Public Libraries rate. A Return has been issued showing the extent to which, and the manner in which, local authorities are applying these funds in (A) England, (B) Wales, and (C) Ireland. The results are summarised below, the amount shown for Wales and Monmouth, in line B, being exclusive of the amount—estimated at 43,203*l.*—to be devoted annually to intermediate and technical education under the Welsh Intermediate Education Act, 1889:—

Total amount expended on technical education during the year 1898-99.	Total amount expended on technical education during the year 1899-1900.	Total amount raised by loan on the security of the local rate under the Technical Instruction Acts (or otherwise) during the years 1898-99 and 1899-1900 respectively.	
		Year 1898-99.	Year 1899-1900.
£ s. d.	£ s. d.	£ s. d.	£ s. d.
(A) 830,404 17 2	876,436 6 11	104,301 2 4	80,347 10 7
(B) 35,658 11 4	33,526 1 11	1,000 0 0	—
(C) 4,549 3 1	5,172 6 3	—	10,000 0 0
870,612 11 7	915,134 15 1	105,301 2 4	90,347 10 7

#### SOCIETIES AND ACADEMIES.

##### LONDON.

**Physical Society, November 8.**—Mr. T. H. Blakesley, vice-president, in the chair.—A paper on a voltmeter for small currents was read by Dr. R. A. Lehfeldt. The instrument consists of a capillary tube about 25 cms. long completely filled with mercury with the exception of a bubble of mercurous nitrate solution about 1 cm. long placed near the middle of the tube. Connection with the two mercury columns is made by means of platinum wires passing through the side of the tube. To use the instrument it is placed in a vertical position, the anode being at the top, and the quantity of electricity which passes through is measured by the change in volume of either electrode. In a test experiment the change in volume was measured by means of a micrometer, and agreed within 0.6 per cent. with the amount deduced from the known value of the current. It is necessary that the currents should be small, so as to avoid complications due to polarisation. The chairman pointed out that the presence of air in the tube would render the readings inaccurate, and asked if it was necessary to apply any temperature correction. Dr. Lehfeldt said that it was quite easy to seal the tube without admitting air, and the temperature correction was negligible.—A note on a paper by Prof. Fleming and Mr. Ashton entitled "On a Model which Imitates