

a technical school. There is a distinction between the secondary school and the junior technical school, created and maintained by the regulations of the Board of Education, which can only be regarded as a social one. In a junior technical school, the hours are longer, and the permitted syllabus restricted and curtailed. Permission to teach any language, other than English, is almost invariably refused. Boys enter these schools at the age of about 13 for a two years' course or at the age of 12 for a three years' course, and the progress of desirable boys towards a university degree or the diploma of the engineering associations is stopped, because these examinations require some knowledge of a foreign language. Boys from a junior technical school who wish to proceed further have to commence the study of a foreign language either in full-time day technical classes, or, after entering industry, in part-time evening classes. The time in these classes could be devoted wholly to professional studies if the language could be learnt earlier. One sequel to this is that the Matriculation Board of the Northern Universities has seen fit to introduce an alternative matriculation examination for technical students.

To all children, education from the age of 11-14 should be on secondary or secondary-technical lines. The child should be graded, and should have the benefit of specialist teachers, a wide choice of curriculum according to his needs, *i.e.* his present educational needs depending on his natural bent or bias, the benefit of uncrowded classes and practical science laboratories and workshops. If a name is required it might be called the junior or lower secondary stage.

At the age of 14, if the child is to continue full-time education, for whatever purpose—for the learned professions, commerce, industry, or what you will—there must be no social distinctions in the State-aided or controlled schools. The education up to the age of 16 must be a continuation of the junior or lower secondary work, but widened and varied to meet the needs and tinged with the colour of the coming career. This type of education must be as much technical with a secondary bias, as secondary with a technical bias.

From the ages of 16-21 the widening apart of the lines would be more marked. Some would continue with advanced studies in the secondary school, some at the technical school, until they reached the age of 18, but here there must be no overlapping. At eighteen many would proceed to the universities; others would continue work of university rank in the technical school. In teaching adolescents from sixteen onwards the technical school is fulfilling its highest function. It is the local college, the local university in all but name. Nearly all the modern universities have grown out of the local technical school, in some cases the Mechanics' Institute.

For those who leave school at 14, 16, or 18 years of age to enter industry, there are evening classes—after a full day's work, if they are not unemployed. For these students the only satisfactory system of continuing their general education, combined with training in their technical work, or to fit them for the higher positions in their career, is some form of "sandwich system"—a system in which periods of work and study are alternated with due regard to their requirements.

Viscount Leverhulme gave an interesting address at the second day's proceedings. The object of education, he said, is to enable us to lead happy and useful lives, and technical education ought to be in accordance with the after requirements of the pupil. Some have a prejudice against the university trained man in business. At the same time the best training

is in the hard school of life, and practical experience should be interwoven with high technical qualifications. Much of the technical education imparted to students is not made use of in distant countries, whereas within the Empire we have the finest possibilities of development.

In education there are two human elements—the animal and the spiritual—and in the spiritual, where we are dealing with humanity, education is greatly lacking. Technical teachers have not only to produce technical experts to carry on the business of this great Empire, but also to produce men and women.

### University and Educational Intelligence.

CAMBRIDGE.—The following re-appointments have been made: Dr. F. H. A. Marshall, Christ's College, to be reader in agricultural physiology; Mr. A. Amos, Downing College, to be University lecturer in agriculture; Mr. F. T. Brooks, Emmanuel College, to be University lecturer in botany; Mr. J. E. Purvis, Corpus Christi College, to be University lecturer in chemistry and physics in their relation to hygiene and preventive medicine; Dr. R. H. Rastall, Christ's College, to be University lecturer in economic geology; Mr. T. W. Landon, Clare College, to be University lecturer in mechanical engineering; Mr. H. Woods, St. John's College, to be University lecturer in palæozoology; Mr. T. S. P. Strangeways, St. John's College, to be University lecturer in special pathology; Mr. H. McCombie, King's College, to be University lecturer in chemistry; Dr. L. A. Borradaile, Selwyn College, and Mr. F. A. Potts, Trinity Hall, to be University lecturers in zoology; Mr. W. D. Womersley, Emmanuel College, to be demonstrator in mechanism and applied mechanics; and Dr. H. Hartridge, King's College, Dr. H. Roberts, Clare College, and Mr. T. R. Parsons, Sidney Sussex College, to be demonstrators in physiology.

Lieut. P. R. Antrobus, R.E., Trinity College, has been awarded the Rex Moir Prize in the Mechanical Sciences Tripos.

An election to the Charles Abercrombie Smith Research Studentship of 150*l.* a year for two years at Peterhouse for candidates for the Ph.D. degree will be made at the end of July. Applications must reach the Tutor, Peterhouse, not later than July 7.

The Committee on Geodesy and Geodynamics records the completion of the new Pendulum House near the University Observatory. Pendulum apparatus loaned by the Science Museum, South Kensington, has been erected and is in use along with some newly designed apparatus to connect gravity determinations at Kew and Cambridge and to throw light on a suggested change in the value of gravity at Dehra Dun in India during the past twenty years.

LEEDS.—Some time ago a movement was started through the University for raising a fund with the object of signalling the distinguished services which Prof. Arthur Smithells had rendered to the community in so many directions, and particularly to the science of chemistry and the University of Leeds during his thirty-eight years' tenure of office as professor of chemistry, which terminated at the end of the session 1922-1923. The fund has been generously supported, and all who have interested themselves in the movement will be pleased to learn that the attainment of its object is now secured. Mr. Fiddes Watt, R.A., has undertaken the commission to paint a portrait of Prof. Smithells for presentation to the University, and a fund of at least 2000*l.* will remain for the endowment of a scholarship in the University bearing the name of Prof. Smithells and instituted

along lines approved by him. As the fund will shortly be closed, any further subscriptions to increase the value of the scholarship should be sent at once to the Treasurer, The Smithells Fund, Beechwood, Roundhay, Leeds.

DR. H. MARTIN LEAKE has been appointed Principal of the Imperial College of Tropical Agriculture in succession to Sir Francis Watts, who will retire next November. Dr. Martin Leake was formerly Director of the Department of Agriculture and a member of the Legislative of the United Provinces, India. In 1919 his services were lent to the Egyptian Government, which he advised on cotton, and last year he was a member of a joint commission with Sir John Russell to advise the Sudan Government on the organisation of agricultural research.

THE Commissioners for the Exhibition of 1851 have awarded Senior Studentships for 1924 to the following: (1) Mr. T. M. Cherry (Melbourne and Cambridge) for research in mathematics, on the recommendation of the University of Cambridge; (2) Mr. Malcolm Dixon (Cambridge) for research in bio-chemistry, on the recommendation of the University of Cambridge; (3) Dr. R. D. Haworth (Manchester) for research in organic chemistry, on the recommendation of the University of Oxford; (4) Mr. R. W. Lunt (Liverpool) for research in physical chemistry, on the recommendation of the University of London, University College; (5) Mr. G. M. Morant (London) for research in anthropology, on the recommendation of the University of London, University College.

THE progress of education in India, 1917-1922, is reviewed in a report recently issued by the Educational Commissioner with the Government of India (Superintendent of Government Printing, India, Calcutta, Rs. 1.6). The report, a very readable one, shows that throughout the quinquennium the course of educational administration was affected strongly by political movements. The years 1917-1920 saw a flood of ill-informed enthusiasm for "fighting illiteracy" and so enabling the masses to read political "literature" and ballot papers. Then came "non-co-operation" and the boycotting of schools recognised by Government, accompanied by the setting up of so-called national institutions showing no distinctive feature worthy of imitation and some highly objectionable. Some indication of the resultant changes is given in the following statistics of enrolments in each of the three years 1919-20, 1920-21, 1921-22: (000 omitted) Arts Colleges, 52½, 48, 46; High Schools, 632, 601, 595; Middle Schools, 650, 654, 645; Primary Schools, 6134, 6328, 6310. The leaders of this movement found an effective weapon in the growing dissatisfaction with the contents of the school and college curricula, and the Education Departments should profit by the attention thus directed to the necessity for a restatement of their educational aims. A particularly useful part of the report is a summary of the origins and points of resemblance and difference of the new universities. In this connexion, it is noteworthy that with the transfer of educational control from the central to the local government, there is a growing danger of an exaggerated provincialism, especially in higher education. The universities, as well as the Departments of Education, are helped to keep in touch with one another by the Bureau of Education and by the Central Advisory Board set up by the Government of India in 1921, but the project for an Association of Indian Universities debated at the congress, held in the same year, of all the universities of the British Empire, has not materialised.

### Early Science at the Royal Society.

**June 22, 1664.** The dog, that had a piece of his skin cut off [for grafting purposes] being inquired after, and the operator answering, that he had run away, it was ordered that another should be provided against the next meeting for the like experiment, Dr. Wilkins and Dr. Charleton to have the better care.

**June 23, 1686.** A note from Mons. Justel was read, giving an account of a book about hygrometers then printing at Paris; that the hygrometer of the Society was the first.

**June 24, 1663.** Mr. Graunt mentioned that he knew a fishmonger, who in 1658 put three carps into a pond, which at the end of four years were multiplied into 875, the smallest of which were 15 or 16 inches long. He was desired to bring the story, with all its circumstances, in writing. And all those members, who had opportunity were to make several experiments on several fishes relating to their growth.

**1669.** The president having proposed from the commissioners of the navy, that the Society would undertake the weighing up of the wrecks in the Thames at Woolwich; upon debate, it was resolved, that his lordship should be desired to return this answer, that the Society being destitute of the necessaries for undertaking such a work were ready to give their assistance to his Majesty's officers therein, and to depute certain persons of their body to take care of the performance, referring themselves to his Majesty's gratification upon the effecting thereof.

**June 25, 1684.** There was shewn an account of the weather during the month of May last, as it was observed at Dublin by Mr. William Molyneux.

**June 26, 1679.** Mr. Hooke produced an intire cocoa-nut, which was newly brought from Barbados; and he caused it to be cut in sunder, and poured out of the middle of it a glass full of liquor . . . tasting sweetish and pleasant like an emulsion.

**June 27, 1666.** The experiments appointed for the next meeting were—The prosecution of a circular pendulum to be applied to a clock.—The two balls on a pendulum, to show the motion of the earth and moon, with the contrivance of a sand-box to have the sand run out, for representing the line of that motion.

**1667.** It was proposed to have a rarefying engine made of wood big enough for a man to sit in. This was approved of by Mr. Boyle. Mr. Hooke was ordered to have one made as soon as possible. He proposed a contrivance, which he had, to make a vessel [to] swim in under water, of any dimension, wherein he might pass as fast as in a wherry upon the Thames, and at any depth he pleased, with safety. He was ordered to compute the charge of such an engine, and report it.

**1678.** Mr. Wicks brought in and read a paper, delivered to him by some Quakers, concerning the great benefit that would accrue to the nation by the setting up and encouraging several new manufactures whereby to keep the poor at work. To which the Society returned for answer, that their address was more proper to the parliament, the matter not properly lying before the Society.

**June 28, 1665.** It was resolved that the public assemblies of the Society be henceforth discontinued [as from this date on account of the spreading of the plague] till summoned again. The members of the Society were then exhorted by the president [Viscount Brouncker] to bear in mind the several tasks laid upon them, that they might give a good account of them at their return; and Mr. Hooke was ordered to prosecute his chariot-wheels, watches, and glasses, during the recess.