

but cannot do so because there are not the men with the requisite knowledge and common sense required for inspectorates. There are others that wish for research to develop so as to conserve existing industries as well as to discover new ones, and they, too, are compelled to mark time.

In default, or in spite, of the efforts of the schools of pure zoology, attempts are being made to set up special training schools in fisheries, in entomology, and in other economic applications of zoology. Each branch is regarded as a science, and the supporters of each suppose they can, from the commencement of a lad's scientific training, give specialised instruction in each. The researcher in each has to do the research which the economic side requires. But he cannot restrict his education to one science; he requires to know the principles of all sciences; he must attempt to understand what life is. Moreover, his specialist knowledge can seldom be in one science. The economic entomologist, however deep his knowledge of insects may be, will find himself frequently at fault in distinguishing cause and effect unless he has some knowledge of mycology. The protozoologist must have an intimate knowledge of unicellular plants, bacterial and other. The animal-breeder must know the work on cross-fertilisation of plants. The fisheries man requires to understand physical oceanography. The helminthologist and the veterinary surgeon require an intimate knowledge of a rather specialised "physiology." All need knowledge of the comparative physiology of animals in other groups beyond those with which they deal, to assist them in their deductions and to aid them to secure the widest outlook. It is surely a mistake, while the greatest scientific minds of the day find that they require the widest knowledge, to endeavour to get great scientific results out of students whose training has been narrow and specialised. Such specialisation requires to come later, and can replace nothing. This short cut is the longest way round. The danger is not only in our science, but in every science.

Surely the time has now come for us to lift our eyes from our tables of groups and families, and, on the foundations of the knowledge of these, to work on the processes going on in the living body, the adaptation to environment, the problems of heredity, and at many another fascinating hunt in unknown country. Let us teach our students not only what is known, but, still more, what is unknown, for in the pursuit of the latter we shall engage eager spirits who care naught for collections of corpses. My own conviction is that we are in danger of burying our live subject along with our specimens in museums.

As a result of the wrong teaching of zoology, we see proposals to make so-called "Nature-study" in our schools purely botanical. Is this proposal made in the interests of the teacher or of the children? It surely cannot be for "decency" if the teaching is honest, for the phenomena are the same, and there is nothing "indecent" common to all life. "The proper study of mankind is man," and the poor child, athirst for information about himself, is given a piece of moss or duckweed, or even a chaste buttercup. Is the child supposed to get some knowledge it can apply economically? Whatever the underlying ideas may be, this course will not best develop the mind to enable it to grapple with all phenomena, the aim of education. If necessary, the school teacher must go to school; he must bring himself up to date in his own time, as every teacher in science has to do; it is the business of universities to help him, for nothing is more important to all science than the foundations of knowledge.

### Native Races of the Empire.

AMONG the resolutions adopted by the General Committee of the British Association during the recent meeting at Cardiff, several dealt with problems connected with the native races of the Empire. Of these one referred to the deplorable conditions now prevailing among the aboriginal tribes of Central Australia, of which an account was recently given in these columns (see NATURE, July 8, p. 601). The Association urged upon the Federal Government and the Governments of Western Australia and South Australia the desirability of establishing an absolute reservation upon part of the lands now occupied by the tribes within the jurisdiction of these Governments in order that they might be preserved from extinction. The resolution further emphasised the necessity of establishing a medical service for the natives in order to check the ravages of disease by which they are now rapidly being reduced in numbers. It may be hoped that the influence of the Association will add force to the movement which has already been set on foot in South Australia, and induce the Governments concerned to take action in this matter.

A second resolution of the Association dealt with the desirability of initiating an anthropological survey of the natives of Western Australia. In this State the natives are under the control of Protectors of Aborigines, and are, for the most part, either located on Government farms or stations, or, if employed by private owners, the conditions of their employment are strictly regulated by the Protectors. Notwithstanding the measures taken for their well-being and preservation, which include a medical service and an organised system of food-supply for times of scarcity, they are dwindling in numbers. At the same time, in the changed conditions, the memory of their tribal customs and traditions is being lost. In the interests of science it is, therefore, highly desirable that some record should be made of their language, customs, traditions, and beliefs, as well as of their physical characters, before the older members of the tribes die out.

During the past summer, it will be remembered, Gen. Smuts introduced into the South African Parliament a Bill dealing with the native population. This Bill has been described as embodying the most important proposals in reference to the native problem since the Glen Grey Act. Briefly stated, its main provisions aim at improving the position of the native, and at the same time meeting his claim to a voice in the regulation of his own affairs by developing a system of local government based upon the tribal social organisation. A further resolution of the Association pointed out that any attempt to bring the native population into closer touch with the social and economic development of the country as a whole—the crucial problem of native legislation in South Africa—could hope to be successful only if it were based upon an intimate knowledge of native psychology and customs, and to this end it urged upon the Government of the Union the necessity for the establishment of an Ethnological Bureau for the collection of data and the study of native institutions.

### Relativity.

DR. C. E. ST. JOHN gives in the *Observatory* for July some remarks on the search for the Einstein effect in the solar spectrum which was made last year by L. Grebe and A. Bachem at Bonn, and alluded to with approbation in a letter from Dr. Einstein, quoted in NATURE for January 29

last. Dr. St. John thinks that the dispersion of their spectrograph, 1 mm. per Å.U., was too low for work of this character, especially where the lines are so close together; further, the comparison spectrum was not photographed simultaneously, but before and after. The arrangements for eliminating the solar rotation are also not considered to have been exact enough.

Dr. St. John then goes on to criticise their suggested explanation for the failure of some other observers to detect the Einstein shift, which was, in short, that unsymmetrical emission lines become symmetrical in absorption. He shows that this neglects the light radiated by the vapour itself; since the absorbing vapour is at various depths in the sun, the probable result is shown to be an unsymmetrical absorption line. The further argument is made that many of the iron lines are unsymmetrical in the reverse direction to the carbon lines in question, so that if the explanation were true, these lines should give too large an Einstein effect, which they do not.

Dr. St. John concludes by saying that the object of his note is not to deny the existence of the Einstein effect, but merely to throw doubt on the completeness of the proof put forward by Messrs. Grebe and Bachem.

*Astr. Nach.*, 5051, has an article by K. F. Bottlinger in which a possible astronomical test is suggested to distinguish between the relativist view of the speed of light and the earlier view of the stationary æther. He notes the very high radial velocities of the spiral nebulae and clusters, and concludes that it is, *a priori*, likely that the velocity of our stellar system relatively to the æther is of the same order. If we take it as 1000 km./sec., and also assume that the direction of motion is not distant from the plane of the ecliptic, then eclipses of Jupiter's satellites will be alternately accelerated and retarded by some 14 sec., according as Jupiter lies towards the apex or antapex. The eclipses observed at Harvard make it pretty certain that there is no residual of this amount in the eclipse times; so that either the fixed-æther doctrine of light transmission is wrong or the speed of our system in the æther is only a small fraction of 1000 km./sec. This proposed test differs from the Michelson-Morley experiment in being a first-order effect, while that is of the second order.

### University and Educational Intelligence.

*Science* of August 20 reports that the Harvard University School of Medicine has received 70,000l. from the Rockefeller Foundation for the development of psychiatry, and 60,000l. for the development of obstetric teaching.

THE *Chemist and Druggist* announces that the chair of chemistry in Berlin University, rendered vacant by the death of E. Fischer, will be filled by Prof. Haber, who will retain also his present position of director of the Emperor William Institute for Physical and Electro-Chemistry.

THE governors of the Northern Polytechnic Institute, Holloway, N.7, are, on September 27, opening a school of rubber technology. There will be day and evening courses designed mainly to train those who have already acquired a thorough knowledge of chemistry and physics and are now desirous of taking up responsible positions of a scientific and technical nature in rubber factories. The school will be in close touch with the industry, as it will be under an advisory committee composed of representatives of the manufacturers, producers, merchants, rubber engineers, etc. The director of the courses is Dr. P. Schidrowitz, who is a leading authority on rubber.

FROM the Simla correspondent of the *Pioneer Mail* for August 6 we learn that the text of the Muslim University Bill has been published. It is proposed to dissolve the Muslim University Association and the Mohammedan Anglo-Oriental College, Aligarh, and to transfer the property of these societies to a new body called "The Aligarh Muslim University." The Bill secures to the Government powers of control, and to the University the assurance of a permanent endowment. The University will be of the teaching and residential type, and its degrees will be recognised by the Government. Special features of the institution will be the instruction of Muslims in Muslim religious education, and the inclusion of departments of Islamic studies.

THE calendar of the Edinburgh and East of Scotland College of Agriculture for the year 1920-21 contains a detailed account of the courses of instruction available at this centre for the degree of B.Sc. of Edinburgh University, for the college diploma in agriculture, and for the college diploma in horticulture. Short courses in agriculture are provided during the winter months for the benefit of farmers and others who are unable to attend the full diploma course; these last for five weeks and extend over two years. In addition, a short course in forestry lasting four weeks may be given during the summer of 1921. The college also acts in an advisory capacity to farmers in the central and south-eastern counties of Scotland. Epidemics of insect or other pests on crops, trees, or live-stock are investigated, and information on farm and dairy management is always available. Manures and seeds for experimental work are tested at specially low rates with the idea of encouraging farmers to conduct experiments and trials in collaboration with the college staff.

THE current issue of the *British Medical Journal* is the annual educational number. As usual, it is addressed mainly to two classes: those who need information as to the course which must be followed in order to become legally qualified practitioners of medicine, and those who, having obtained qualifications to practise, are doubtful as to what particular branch of medicine they should choose as a career. The student is advised to aim at a university degree in medicine at the outset of his career, though it may be desirable to take also a diploma or licence. Warning is also given with regard to the question of expenses. The outlay involved in completing a medical curriculum varies, but 1500l. is reckoned to be the minimum for which the training can be accomplished at the present time. For the medical graduate, diplomate, or licentiate, once his name is on the Register of the General Medical Council, many paths are indicated; but he is reminded that whatever the branch of practice chosen, the main reward of medical life is the knowledge of good work well done. Against this it is urged that the spirit of the times is all in favour of the extension and co-ordination of the public health services. This has occasioned an increase in the official medical services, but their position is not well defined at present, and prospects of promotion are uncertain.

THE new session of the Sir John Cass Technical Institute, Aldgate, will commence on Monday, September 27. The courses of instruction provided are especially directed to the technical training of those engaged in chemical, metallurgical, and electrical industries and in trades associated therewith. Special courses of higher technological instruction form a distinctive feature of the work of the institute. The curriculum in connection with the fermentation industries includes courses of instruction in brewing