the relative importance of these is in the order named. The point is worth noting, because it has become the fashion lately to decry knowledge especially. "Be good," says one, "and let who will be wise"; and Tennyson exclaims of knowledge, "Let her know her place; she is the second, not the first."

Such sayings are based upon a false psychology; for the mind is not a thing of only one or two dimensions, but of three, and there is no first and no second where all three are equal. One might as well say, "It is nobler to breathe and to sleep than to eat; therefore let us do without food." And, indeed, this is the actual faith of the Indian fakir, leading to a futile philosophy which was becoming very prevalent even in this country before the war, and which I called "fakirism." When this evil spirit enters into the mind of a nation, that nation is doomed. Like the Indian fakir, it will be content to sit by the roadside of life and to achieve nothing thereafter except the pursuit of idle dreams, as many nations have done and are doing. It is your mission, I take it, to contend against this spirit, to rouse the fakir, and to put some of the abhorred beef and bread of natural science into him, so that he shall begin to do honest work again.

All this is really very pertinent to our theme. For if knowledge is of no account, why trouble to teach any at all? But if it is of some account, then why not teach knowledge that is useful as well as sound? But here we strike at once across two dogmas which I have often seen repeated in educational literature. The first is that the object of education is not to impart knowledge, but to exercise the mind in the art of acquiring knowledge for itself in after-years. There is some truth in that, but also a fallacy. For how can we exercise a mind in the art of acquiring knowledge except by the practice of that art? We might as well try to teach a boy to swim without putting him in the water. Then there is the second dogma, which is just the opposite—that what is taught at all must be taught thoroughly. Now I am no teacher of young boys myself, but I doubt the policy. I think that it is advocated in disregard of the natural law that living beings tend to hate a food which is offered to them too constantly. Moreover, we can never know in which direction a boy's aptitude really lies; and, lastly, it is impossible to teach anything thoroughly to anyone, for all knowledge is infinite. I conclude, therefore (though I may be wrong), that it is not good to bury a youth at the bottom of a mine in order that he shall search there for some gold which perhaps he will never find; but that it is better to take him speedily to a height whence he can survey the whole world and choose for himself the field for his own future work.

Neither you nor I will pretend that natural science is to be the only subject to be taught; but I cannot conceive how anyone who does not possess some broad knowledge of the immense accumulation of facts about Nature collected by humanity during the last two thousand years can dare to call himself an educated person. Some years ago a headmaster whose name I have forgotten maintained that a study of the stars is unimportant for men. He meant, not men, but earthworms. A man is, or ought to be, something more than an animal, and the very definition of him is that he *shall* study the stars.

Of course, in this very brief survey I have been obliged to omit reference to some points even of the first importance, such as manners and *morale*, for instance; and to exclude university education, which is the privilege only of a few persons. I will conclude now with the following summary of my own opinions—for what they are worth. I think that our system of open-air education, in which the public schools set the example, is a most invaluable and essential part of education. Closely connected with it is the principle of personal honour, good temper, and duty—that is, a spirit of *noblesse oblige*, which that open-air education, more than anything else, fosters and inculcates. On the other hand, I think that our system of education is defective as regards the imparting of fundamental knowledge. Most of the great knowledges of humanity are not implanted in the minds of our youth—not only the great discoveries of science, but also the great discoveries of literature, including classical literature, and of the high poetry, painting, music, and philosophy, which constitute the principal heritage of the human race. Indeed, knowledge is often actually derided by the numerous apostles of "fakirism" in this country, or replaced by a useless lumber of unimportant matter; and foreign languages and many of the petty but useful arts of life are much neglected. Hence the whole intellectual side of life is too frequently ignored, or even despised, by the masses of the people, with the result that their judgment is starved for lack of facts, and that they become too often the slaves of fads and quackeries and unproven dogmas of every description—party politics, meretricious propagandas, ignoble creeds, and even sometimes superstitions that savages would laugh at. But behind these and other defects the nation possesses by nature a kindliness, a sense of humour and fair play, and an unopposable force of good intention which have made it during the last four years the pattern and exemplar of the world.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

DR. M. C. RAYNER has resigned her appointment as lecturer in botany (lecturer-in-charge) at University College, Reading.

DR. R. M. CAVAN, of the chemistry department of University College, Nottingham, is leaving shortly to take up his duties as principal of the Technical College, Darlington.

THE sum of 3000*l.* has been given by Mr. G. T. Hawkins, of Northampton, towards the building and equipment of a pathological laboratory at the Northampton General Hospital.

MR. W. H. WATSON, of the chemistry department of the Northern Polytechnic Institute, has been appointed vice-principal and head of the chemistry and natural science department of the Municipal College, Portsmouth.

THE organised laundry trade is establishing a research department, the object being to increase efficiency through science and invention, and towards this a Croydon launderer has offered 100*l.* and 50*l.* yearly for five years.

TWO Theresa Seessel research fellowships, each of the value of 200*l.*, are being offered by Yale University. The fellowships are intended to promote original research in biological studies, and are open to men or women. Applications, accompanied by reprints of scientific publications, letters of recommendation, and a statement of the particular problem which the candidate is prepared to investigate, must be made before April 1 next to the Dean of the Graduate School, New Haven, Conn., U.S.A.

GOOD progress has been made in the formation of the Society of British Science Students, to the inauguration of which attention has been directed already in these columns. A temporary executive has been elected, of which Mr. P. E. Owens, 28 Jesse

Terrace, Castle Hill, Reading, is the hon. secretary. The principal object of the society is to strengthen the relations between the younger students of science in this country by means of meetings, lectures, and publications, and by other suitable measures. The society will endeavour to secure privileges for its members in regard to other societies and to circulate information among the members relating to scholarships, vacant appointments, and so on. All inquiries should be addressed to the hon. secretary.

THE *Publishers' Circular and Booksellers' Record* records a total of 7716 books as having been published during the year 1918. This is a decrease of 415 compared with the previous year, and it is accounted for chiefly by a falling off in the number of works of fiction (−523) and juvenile literature (−155); other classes that have also decreased slightly are education, agriculture, domestic, business, history, and geography. On the other hand, sociology has increased by 112, technology by 110, medicine by 80, and poetry by 98. Under "Science" the number of new books recorded is 232, also 5 translations and 28 pamphlets. In addition, there were 64 new editions, making a total of 329. In the year 1914 science occupied the third place in twelve classes of literature, and technology the fifth place; in 1918 technology was in the eighth place and science in the tenth.

A COURSE of nine lectures on dynamical meteorology will be given at the Meteorological Office, South Kensington, by Sir Napier Shaw, reader in meteorology in the University of London, on Fridays, at 3 p.m., beginning on January 24. Each lecture will be followed by a conversation class for the discussion of practical details and of references to the original sources of information. The informal meetings at the Meteorological Office for the discussion of important current contributions to meteorology, chiefly in Colonial or foreign journals, will be resumed at 5 p.m. on Monday, April 28, and will be continued on each Monday until June 23, with the exception of June 9. Students wishing to attend should communicate with Sir Napier Shaw. The lectures are intended for advanced students of the University of London and others interested in the subject. Admission is free by ticket, obtainable on application at the Meteorological Office.

THE London County Council has arranged a series of special lectures for teachers, on subjects connected with problems of reconstruction, for the spring and summer terms of the present year. Full particulars are contained in the Handbook of Classes and Lectures for Teachers" published by the Council. Among the numerous courses of lectures the following may be mentioned: the last three of the series on "Science and the Nation," viz. engineering, with special reference to its relations with our national life, by Prof. W. E. Dalby, at 11 a.m. on January 25, at the City and Guilds Engineering College of the Imperial College of Science and Technology, South Kensington; pure science in relation to the national life, by Prof. A. Schuster, at 11 a.m. on February 15, at the Regent Street Polytechnic, W.1; some aspects of the rubber-growing industry, by Prof. J. B. Farmer, at 11 a.m. on March 8, at the Regent Street Polytechnic, W.1. At King's College, Strand, on Wednesdays, at 5.30 p.m., beginning on February 5, a course of public lectures on "Physiology and National Needs" will be delivered. The lectures include physiology and the food problem, by Prof. W. D. Halliburton; physical training of the open-air life, by Dr. M. S. Pembrey; "vitamines"—unknown but essential accessory factors in diet, by Prof. F. G. Hopkins; scurvy—a disease due to the absence of vitamine, by Prof. A. Harden; physiology and the study of disease, by Prof. D. N. Paton; and conservation of our cereal reserves, by Prof. A. Dendy. Applications for admission to these lectures should be addressed direct to the secretary of the college.

THIS year's educational gatherings included a joint meeting on January 2 of the Headmasters' Conference and the Incorporated Association of Headmasters, at which the reports of the Government Committees on science and modern languages were considered. After some discussion the following resolutions, dealing with the teaching of science and mathematics, were adopted by the conference:—(1) That suitable instruction in natural science should be included in the curriculum of preparatory schools, of the upper standards of elementary schools, and of all boys in public and other secondary schools up to the age of about sixteen. (2) That mathematics and natural science should be necessary subjects in the entrance scholarship examinations of public schools, in the first school examination, and in the examinations for entrance into the Navy and the Army, provided that good work in other subjects should compensate for comparative weakness in mathematics and natural science. (3) That for boys between twelve and sixteen the teaching of natural science should not be confined to physics and chemistry, but should include some study of plant and animal life, and that more attention should be directed to those aspects of science which bear directly upon the objects and experience of everyday life. (4) That there should be as close correlation as possible between the teaching of mathematics and of science. After a discussion of the report on the teaching of modern languages the conference passed resolutions, among others, declaring that the study of one or more languages other than English should be regarded as an essential part of higher education; that the first language other than English should be begun at about the age of ten, the second language not beginning until there was evidence of satisfactory progress in the first; and that usually the first language should be French and the second Latin.

SOCIETIES AND ACADEMIES.

LONDON.

Geological Society, December 18, 1918.—Mr. G. W. Lamplugh, president, in the chair.—C. T. **Trechmann**: A bed of inter-Glacial loess and some pre-Glacial freshwater clays on the Durham coast. A few years ago the author described a bed of Scandinavian drift that was found filling up a small pre-Glacial valley-like depression at Warren House Gill, on the Durham coast. This section, and others north and south of it, have been kept under observation at different times, and several new features have been noticed as the high tides and other agencies exposed parts of the coast. All the observed features seem to point to the fact that the Scandinavian ice-sheet advanced on the east coast of England in the same way as it invaded northern Europe round the southern shores of the Baltic, and gave rise to analogous climatic conditions leading to the formation of loess, a fragment of which is found protected from the erosive action of the later local glaciation in a small hollow on the Durham coast.

PARIS.

Academy of Sciences, December 23, 1918.—M. P. Painleve in the chair.—C. **Guichard**: A series of surfaces of constant total curvature such that their lines of curvature form a network of the type pA', $-pB'$.—M. Georges Charpy was elected a member of the divi-