In 1847 the British Association met in Oxford. Shortly afterwards a memorial was drafted for presenting to the University urging greater facilities for the study of natural history and science. It was, however, strangled in the birth, even so great an advocate of science as Buckland refusing to sign it. "Some years ago," he wrote, "I was sanguine, as you are now, as to the possibility of natural history making some progress in Oxford, but I have long come to the conclusion that it is utterly hopeless." We shall agree that it required some courage on the part of Dr. Tait to start the teaching of science at Rugby in the face of the almost universal condemnation of the study as frivolous and dangerous.

Between the years 1859 and 1864 Canon Wilson and others did some good voluntary work in geology. About this time a Royal Commission recommended that every boy should receive instruction in one or other of the sciences, and Dr. Temple engaged a science master from Birmingham with the view of carrying out the recommendation at Rugby. But Hutchinson could not enter on his duties till 1865, so Canon Wilson and Kitchener, who two years later became the first president of the Natural History Society, undertook to teach botany. Sir J. D. Hooker planned a course of study, and as the masters were not experts in the subject, they devoted their holiday to a six weeks' course at Barmouth, with Henslow as their coach. Such enthusiasm merited the reward it received.

The way was thus prepared for the inauguration of a society which should undertake the voluntary study of Nature, independently of the school curriculum, and on March 23, 1867, the Natural History Society was founded by a little group of eight boys and one master. The portrait of the master, Kitchener, is given as frontispiece to the current report. Some idea of the good work which the society has since accomplished may be obtained by reference to the pages dealing with natural history which give such value to the "County History of Warwickshire," in which the annual reports of the school are laid under frequent contribution.

Most young people probably have an inherent love of Nature, but it depends largely on early environment whether it will die or develop. More than one old Rugbeian has, in the course of the last half-century, made his mark in one department or other of natural history. Thus Longstaff, whose delightful book on "Butterfly Hunting in Many Lands" carries us round the world, writes: "As long as life lasts I shall be grateful to Mr. F. E. Kitchener and Canon Wilson for the substantial addition to my happiness that their instruction provided." Dr. Lucas, F.R.S., whose death last October was so greatly deplored, was another Rugby boy, and acted as curator and secretary in 1898, while the report for 1896 contains a paper by him on photomicrography. Worthington, whose interesting papers on "The Splash of a Drop" won for him election to the Royal Society, first developed his love for this subject while at Rugby.

And what shall we say of that famous Nimrod of modern times, Capt. Selous, whose "African Nature Notes" and other books reveal the perfect naturalist? His obituary, with an excellent photograph, finds a place in this report, but we owe to Canon Wilson a most romantic story of his successful attempt to obtain eggs from a heronry at Coombe Abbey, and the price he had to pay for his daring. We regret that we cannot find space to repeat the anecdote, with others of a similar kind.

That the work of the society is well maintained, and that the interest does not flag, is shown by the original papers as well as by the sectional reports. Without being invidious, we should like to direct special attention to the work of Greg and Bevington in ornithology. Such studies are of inestimable value to young people. They develop the powers of observation, teach patience, sympathy, endurance, and kindness, divert the mind from base pursuits, and open out a fairy realm of beauty and delight, which cannot fail to ennoble, as well as entertain, those who pursue them. Any public school not already in the possession of such an institution may be heartily recommended to follow the example of Rugby.

HILDERIC FRIEND.

AN INSTITUTE OF APPLIED OPTICS FOR FRANCE.

A SCHEME is on foot in Paris to establish an Institute of Applied Optics, with the object of securing closer co-operation between theory and practice in the optical trade. It has been suggested, according to an article in *La Nature*, that the scope of the institute should fall into three sections, viz. (i) a college of optics, providing a thorough theoretical and practical training for opticians, and promoting among its students a taste for optical research; (ii) a central optical laboratory, where tests of glasses and optical instruments would be made for men of science, public bodies, and manufacturers, and research work of general interest carried out; and (iii) a special trade school in which the students could obtain a thorough training in the practical branches of the trade.

It is proposed that the institute should publish transactions in a form following, say, the *Zeitschrift für Instrumentenkunde*.

The students of the college of optics would be recruited from the educated classes—Army and Navy officers, students or ex-students of the universities and technical colleges, astronomers, illuminating engineers, manufacturers of optical instruments, and doctors interested in physiological optics. There would be two distinct branches of instruction, viz. general optics and instrumental optics. The courses would be supplemented by lectures on all modern optical questions. The period of study is suggested as one year.

The central laboratory would serve as a test laboratory for manufacturers of optical instruments and for glass manufacturers, as a practice laboratory for the students, and as a research laboratory for the college staff.

The professional, or trade, school would take young people for three years and give them a thorough training in (i) glass-working, and (ii) construction and fitting up of optical instruments.

The scheme has received the favourable consideration of various Government departments and of certain scientific and learned societies in Paris; indeed, the publication of the transactions of the institute is already assured.

While it would be difficult to install the machinery and plant necessary for the trade section of the institute, it is suggested that the programme of the courses should be considered and the principal courses commenced in the school year 1917–18.

E. S. HODGSON.

THE MAN OF SCIENCE IN THE COMMUNITY OF TO-DAY.[1]

IT is not too much to say that for the first time in the history of the British Empire Science is coming into her own. It is no doubt humiliating to have to confess that it was the misapplied science of our enemies which demonstrated to us how inferior was the place we had given science in our own national

[1] From an address delivered to the Nova Scotian Institute of Science on November 13, 1916, by Prof. D. Fraser Harris.

life. The land that produced Roger Bacon, Napier, Gilbert, Harvey, Newton, James Watt, Jenner, Faraday, Darwin, Kelvin, and Lister had to be shown by the exponents of science prostituted that science was nevertheless worth cultivating for its own sake.

Possibly nothing less terrific than this irruption of Teutonic brutality would have shaken the British race out of its comfortable mental inertia. But having been awakened, let us thankfully admit that our rulers are now doing something towards recognising the all-pervading importance of science in the national life. Committees of various learned societies have been formed; the British Science Guild is taking action; the Royal College of Science has recently presented a petition to Lord Crewe to have men of science adequately recognised; and the Government from early in the war has been consulting men of science on a large number of economic problems. Quite recently Sir J. J. Thomson has been elected chairman of an important committee to study the position of science in secondary schools and at the universities and its relations to trades, industries, and professions which depend on applied science.

It cannot be denied that science, as science, has only very recently been allowed to have an independent existence in our national intellectual system. The time is within the memory of some of us when the attempt to introduce laboratory teaching into the University of Oxford was met with a furious resistance; and when at length studies in practical chemistry were instituted they were alluded to as "stinks." History was repeating itself; for Leo Africanus, writing in the early part of the sixteenth century, thus described the chemical society of the learned Arabians at Fez: "There is a most stupid set of men who contaminate themselves with sulphur and other horrible stinks."

Science is of the very warp and woof of the web of human existence; ought we not to reckon with it officially, as it is called? Has not the time come to *admit* that science is as important as it really has become; for the existence of something and the official admission that it exists are two different things? Why should not science be taken under the care of a Cabinet Minister? It is no longer vulgar, it is no longer beneath the attention of the aristocratic intellect; it is of preponderating usefulness to the nation, and it is malevolent only when divorced from common sense and common morality by the obsessions of self-hypnotised Prussians. It is within a very little of being even a profession! Why not recognise the pursuit of something which is almost a respectable profession? Why not have the official interests and the economic aspects of science presided over by someone who knows something about them?

We need to make science the keynote of our public service and university system, as Humboldt did early in the nineteenth century, when Prussia was as yet under the heel of Napoleon. The peremptory necessity of better scientific organisation is apparent; it is now a question not only of our prosperity, but also of our existence.

Science, in short, must have a Department, a Government office, before the public will fully accord it its place of honour. We may regret that this sort of thing has to be, but our regret will not change public opinion; and it appears to be part of the British Constitution that nothing can be done, or should be done, without a very large body of public opinion behind it. But the official recognition of science cannot wait until the public has seen fit to render science the homage it deserves. To begin at the top, let there be a Minister of Science and a Ministry of Science with just as much prestige accorded it as the War Office, the Foreign Office, or the Home Office. The duties of the Minister of Science would be primarily to foster science in every way possible, to further its interests, to administer its affairs somewhat in the manner in which the Board of Trade looks after trade, and the Board of Agriculture and Fisheries after agriculture and fisheries.

By friendly and intelligent co-operation with the universities, technical colleges, and the leaders amongst the manufacturers, the relations of science to the State could be adequately safeguarded; scientific men would be known, encouraged, subsidised, promoted, rewarded, and pensioned.

For why should State recognition, encouragement, promotion, and rewarding be reserved for sailors, soldiers, diplomatists, and lawyers? Why should it be so entirely correct to be paid for legal opinion, and such "bad form" to be remunerated for scientific advice? Because, you may rely, the law is an ancient, respectable profession, and science is so modern that it is not a profession at all. But this medieval state of affairs cannot go on indefinitely; it was all very well for the day when there was no science to foster, and men quarrelled so much that lawyers were kept very busy, but now "nous avons changé tout cela"—or at least the earlier part of it. One need not here and now draw up an exhaustive list of the duties of the Minister of Science, but may merely remark that much that falls under the supervision of the Home Office could be transferred to the Department of Science. Had there been such a department, Edward Jenner, for instance, would not have had to struggle against every kind of obstacle and misrepresentation for so long a time as he did, or have had to wait so long as he had for the official recognition of what he had done for suffering humanity. Not from his own private house, but from a Government department would the vaccine have gone forth to eager Europe. He truly called himself "The vaccine clerk of the whole world."

The first concern of the Science Office would be the place of science in the schools of the Empire. And here we come up against the still burning question of the rival claims of science and the classics. Of course, it ought to be perfectly possible to instruct boys in as much of Greek and Latin as would make them know the origin of the words in English derived from those languages, without necessarily making the boys read entire Greek and Latin authors in the original. The practice in the past of educating boys as though they were all going to be teachers of the classics is analogous to the teaching of physiology to medical students as though they were all going to be professional physiologists.

Owing to our national physiological momentum, the teaching of boys has been continued on the same lines as those laid down by the educationists of the Revival of Learning in the sixteenth century. What Erasmus, Linacre, and Dean Colet planned was admirable for the day when America and printing had only just been discovered, but is possibly not so well adapted to the country which lights its cities by electric energy, speaks to America without wires, flies in high heaven like the eagle, and descends to the abyss like a sea monster.

The Science Office will see to it that science receives official recognition in all entrance examinations whatsoever, and that it is not handicapped by receiving fewer marks than the classics or any other subject. Science must have its place in the curriculum, not on sufferance or by-your-leave, but by right and in virtue of its inherent dignity and usefulness. Science cannot any longer be the under-fed maid-of-all-work; Science is the queen herself coming into her kingdom.

Science is no longer to be merely permitted, tolerated, apologised for; she must preside at the council board because she already rules the lives of the people.

The academic precedence of the faculties, in which theology, arts, and law come before medicine and science, may still be tolerated at the old universities as an interesting and significant relic of earlier times; but in all modern universities (as in the University of Birmingham from its foundation) science is the premier faculty and takes the first place. The world advances, not because of Church history or Homer or Virgil, but because of James Watt and Stephenson and Dalton and Faraday and Harvey and Jenner and Darwin and Kelvin and Lister. Better fifty days of Faraday than a cycle of Aristotle.

Why is a knowledge of science so useful to the modern community? Apart altogether from the way in which science makes for technical efficiency, it is a means second to none in the training of the intellectual powers. It trains us in accuracy of observation, in the power of drawing trustworthy conclusions, in habits of precise thinking generally; and these are not small things.

Science, the true, is the patient, loving interpretation of the world we live in; it is a striving to attain not merely to an understanding of the laws whereby the world is governed, but to the enjoyment of the beauty and order which are everywhere revealed. And the minds of men capable of attaining to such heights of appreciation, and the evidences around us of an all-pervading personality, are only so many additional phenomena to be apprehended as constituent elements of that vast, sublime, age-enduring cosmos which we call the universe.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

LIVERPOOL.—The council has appointed Dr. P. G. H. Boswell as first holder of the George Herdman chair of geology Prof. Boswell graduated with first-class honours in geology in the University of London, and obtained the degree of D.Sc. in 1915. He has for some years past been lecturer in geology at the Imperial College of Science and Technology, London, and has published many original contributions to geological science. The establishment of a chair of geology in the University has been long delayed, and is now possible owing to the generosity of Prof. and Mrs. Herdman, who have endowed the chair as a memorial to their son, the late Lieut. George Herdman. Prof. Boswell will enter upon his duties in October next.

PROF. C. R. RICHARDS, since 1911 professor of mechanical engineering in the University of Illinois, and head of the department, has been appointed dean of the College of Engineering and director of the Engineering Experiment Station of the University, to succeed Dr. W. F. M. Goss, who has resigned to become president of the Railway Car Manufacturers' Association of New York.

UNDER the will of the late Mrs. Denning, of South Norwood, property of considerable value has been left to form a "Frank Denning Memorial," with the object of promoting the application of modern scientific knowledge to the business life of the community. Mrs. Denning survived her husband only twelve months. The late Alderman Frank Denning was Mayor of Croydon at the time of his sudden decease, and was one of the leading directors of Welford's (Surrey) Dairies, Ltd. He was also a director of colliery companies in Gloucestershire. For some time before his death he was a governor of the Stanley Technical Trade Schools at South Norwood, and his interest had been aroused in the good work being done at these schools. It is not known at present how the terms of the trust will be carried out, but in view of the success of these schools, it is possible that some developments along the lines already laid down may be looked for. Mr. Denning was a business man before anything else, and the terms of the bequest seem to show that technical education is aimed at, and that pure science as a study had no large place in his mind.

THE report of the Vice-Chancellor on the work of the University of London during the year 1916–17 shows that the total number of commissions granted from the outbreak of the war to December 31, 1916, to cadets and ex-cadets of the University contingent of the Officers Training Corps, and to other graduates and students of the University recommended for commissions, was not fewer than 3111; and the honours and distinctions conferred upon officers and cadets during the same period included one Companionship of the Bath, two awards of the Victoria Cross, six of the Distinguished Service Order, 157 of the Military Cross, one of the Distinguished Service Cross, and 199 mentions in despatches, besides from the French Government three awards of the Croix de Guerre and one of the Médaille Militaire. It is recorded that 284 former officers and cadets of the contingent, and thirty-three other officers recommended for commissions by the University, have made the supreme sacrifice for their country. About 21,000 members of the University are, or have been, serving with H.M. Forces. The research work normally conducted in the laboratories attached to the University has been to an increasing degree directed to the assistance of Government departments or other agencies concerned with the requirements of the war. In addition to the response made by teachers and qualified students at the medical schools of our hospitals to the demands of the War Office for physicians and surgeons, considerable services have been rendered to the Government in the departments of physics, chemistry, physiology, pharmacology, bacteriology, metallurgy, and civil, mechanical, and electrical engineering.

SOCIETIES AND ACADEMIES.

LONDON.

Geological Society, May 2.—Dr. Alfred Harker, president, in the chair.—Jane **Longstaff** (*née* Donald): Supplementary notes on Aclisina, De Koninck, and Aclisoides, Donald, with descriptions of new species. Since the publication of a paper by the Geological Society on Aclisina in 1898, knowledge has been gained of the species there described, and six others new to science have been discovered. The diagnoses of these are given. The total number of species of Aclisina is brought up to twenty-two. The genus is best represented in Scotland, where the specimens are generally well preserved. A table is appended giving the range and localities in the British Isles and Belgium. A small variety of *Aclisina pulchra*, De Koninck, appears to have continued for the greatest length of time. Additional observations are also made on *Aclisoides striatula*, De Koninck.—T. H. **Burton**: The microscopic material of the Bunter pebble-beds of Nottinghamshire and its probable source of origin. As shown by the distribution of the heavy minerals, combined with (*a*) the direction of the dip in the cross-bedding, (*b*) the evidence adduced by boreholes and shaft-sinkings, a main current from the west is indicated. A large quantity of the material is derived from metamorphic areas. The source of the bulk of the material is probably Scotland, and the westward