

and, under the persuasion of Ashmole, published a catalogue of the whole collection. Although this catalogue appeared under Tradescant's name, allusions in the preface and the more definite statement of John Evelyn, "printed in his catalogue by Mr. Ashmole," make it almost certain that Ashmole was not only the instigator but also part compiler and editor of this, the first English, catalogue of a natural history museum. The keen interest Ashmole took in the collections would explain why Tradescant should have drawn up a deed of gift in 1659 making over the whole cabinet of rarities at his death to his friend, who, in 1674, after twelve years of controversy and litigation with the widow, moved the collections to his house in South Lambeth, where they were so carefully and methodically preserved as to elicit praise from Izaak Walton.

In 1677 Ashmole offered the whole collection, with the additions he had made to it, to the University of Oxford, on condition that a suitable building was provided for their display. His offer was accepted, a museum was built, the rarities were "put up in cases," and on March 14, 1683, the last loads "were sent to the barge" for transport to Oxford, and Ashmole "relapsed into the gout."

The preamble to his statutes, orders, and rules for the governance of his museum shows clearly that his intention was to provide the University with a museum of natural history, which should be primarily a scientific institution and not a "knick-knackatory," or a collection of historical relics and antiquities, such as has now come to be exclusively associated with his name at the New Ashmolean Museum, of which Sir Arthur Evans was the practical founder. The advancement of natural knowledge was Ashmole's first object; the accumulation of objects of art was not his purpose except in so far as those art objects served to illustrate the application of natural products. The preamble runs as follows:—

"Because the knowledge of Nature is very necessarie to humane life, health, and the conveniences thereof, and because that knowledge cannot be soe well and usefully attain'd, except the history of Nature be knowne and considered; and to this is requisite the inspection of particulars, especially those as are extraordinary in their Fabrick, or usefull in Medicine, or applied to Manufacture or Trade: I, Elias Ashmole, out of my affection to this sort of Learning, wherein my selfe have taken, and still doe take, the greatest delight; for w^{ch} cause also, I have amass'd together great variety of naturall Concretes and Bodies, and bestowed them on the University of Oxford, wherein my selfe have been a student, and of which I have the honor to be a Member. Lest there should be any misconstruction of my intendment, or deteriorating of my donation, I have thought good, according to the Acts of Convocation, bearing date Jun: 4: A^o 1683; and Sept: 19: An^o 1684, to appoint, constitute, and ordaine as follows." Then follow eighteen orders.

Order 6 is an example of his judicious foresight. It enacts "That whatsoever naturall Body that is very rare, whether Birds, Insects, Fishes, or the like, apt to putrefie and decaye with tyme shall be painted in a faire Velom Folio Booke, either with water-colors, or at least design'd in black and white, by some good Master, with reference to the description of the Body itselfe, and the Mention of the Donor in the Catalogue; w^{ch} Booke shall be in the Custody of the Keeper of the Musaeum under Lock and key"

In these days of cheap photography the execution of this order would be a simple matter. Order 7 provides for the exchange or donation of duplicates, and by Order 8 old specimens are to be removed to cupboards.

The new building was constructed so as to include a lecture-room and a chemical laboratory, and for more than a century and a half it was the centre of scientific life in Oxford. For the further advancement of science Ashmole founded the first chair of chemistry in Oxford, and Robert Plot was appointed first Ashmolean professor, and also keeper to the museum. Unfortunately the founder's schemes for the adequate advancement of his favourite subjects were longer than his purse, and he did not live long enough to collect sufficient capital endowment to put the new professorship upon a permanent footing.

Ashmole is not likely to be forgotten in Oxford, yet the destiny that so often militates against just recognition in science has brought it about that his name, the museum and officers he created, are no longer used in accordance with his original ordinances. The museum in which he took so much pride no longer exists as such; even the knick-knacks to which his name is attached can no longer be seen in the building which he persuaded the University to provide; the old Ashmolean building, sadly in need of repair, is degraded to class-rooms, offices, and book stores; the greater part of the scientific specimens which he so greatly valued have been destroyed, and the few fragments that remain distributed; and Ashmole's keeper, relieved of the duties that were put upon him by the founder in respect of the natural history collections, is now in charge solely of the few curiosities which did not in Ashmole's opinion constitute the central feature of his museum.

A fitting commemoration of his name is to lay stress upon the fact that he was one of the pioneers of scientific education in England, that he earnestly endeavoured to promote learning, and that it is only by an error that his name has survived as a collector of curious antiquities. Of the old Tradescant and Ashmole collection some score or two of zoological specimens have survived from the seventeenth century. It is to be hoped that they may once more be brought together in accordance with their donors' wishes and their great historic value.

R. T. GUNTHER.

PUBLIC SCHOOLS AND NATURE STUDY.

THE unusual interest attaching to the report of the Rugby School Natural History Society for the year 1916 warrants our directing attention to the great service which our public schools may render to the cause of natural science. It is the jubilee number, and in addition to the usual features contains much other matter of exceptional interest. Special mention may be made of the racy and valuable paper by Canon Wilson, of Worcester, in which his personal reminiscences of the early history of the society, and, indeed, of the prehistoric period, are set forth with much humour and enthusiasm.

Though the fiftieth anniversary of the founding of the society was celebrated in March last, thus carrying us back to the year 1867—the tercentenary of the school—yet we learn that work on similar lines to those which the society follows to-day was carried on for some years previously. The geological museum dates from the time of Dr. Arnold. Canon Wilson went to Rugby as a master in 1859, and found a large collection of dusty and unnamed specimens in the Arnold Library. But one goes back yet another decade, and finds the year 1849 specially worthy of note. It was then that Dr. Sharp, a resident medical man, gave the first lectures on natural philosophy. Rugby School thus proclaims itself, not abreast, but in advance, of public opinion in regard to the position which natural science ought to occupy in liberal education.

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.