many cases the comparison would undoubtedly prove interesting. But fortunately the descriptions are so good that the student loses less than might be expected, and the results are very valuable, not only to the farmers for whom they were intended, but also to the student of soil problems all over the world.

E. J. R.

THE SCIENTIFIC WORK OF A SCHOOL OF TECHNOLOGY.

THE eighth volume of the Record of Investigations undertaken by members of the Manchester Municipal School of Technology, covering technological researches carried out during the year 1914, has just been issued. It is a highly interesting record of work accomplished, and is comprised in 258 quarto pages replete with explanatory diagrams and photographs illustrative of the text. This attempt to put upon permanent record the investigations conducted by members of the staff and by advanced students was begun in 1905, and has now extended to 2346 pages, and in its eight volumes covers researches carried out since the year 1900 in all departments of the school, including pure and applied mathematics, mechanical engineering, physics and electrical engineering, pure and applied chemistry and metallurgy, the science and practice of sanitation and building, textile manufacture, and the photographic and printing industries.

For investigations in all these important departments of industrial enterprise the school is exceptionally well equipped, and it has, moreover, had the assistance of many enlightened manufacturers, and in this connection many considerable extensions are in contemplation, only awaiting the conclusion of the war to give them full effect. Meanwhile new laboratories for advanced training and research in the subject of coal-tar chemistry in its bearing upon the dye-stuff industry have been opened under the charge of Prof. A. G. Green, of the University of Leeds, with the help and advice of Dr. E. Knecht, the professor of chemical technology, thus giving full opportunity, not only for the efficient training of chemists for the growing demands of the organic chemical industries, but for the establishment of a school of research for the chemistry of dyes and allied substances employed in industrial chemistry.

Many of the articles and researches published in these journals have also appeared in the scientific and technical Press. Lists are also given of important papers read in connection with the various technical societies connected with the school, including the Engineering Society, the Day Students' Chemical Society, the Textile Society, which itself publishes an important journal, the Printing Crafts Guild, and the Bakery and Brewing Students' Societies, together with the titles of fifty-four theses prepared by graduate students in technology for the degree of M.Sc.Tech. in the University of Manchester. Lists also appear of the titles of nearly fifty volumes of technical works issued by members of the staff since 1900.

The eighth volume of the journal under review contains, among other articles of value, interesting papers concerned with the applications of chemical science, such as those on vulcanising, industrial gas-burning, the action of strong nitric acid upon cotton cellulose and of sulphuretted hydrogen upon sodium hydrosulphite, together with papers on the dilution limit of inflammability of gaseous mixtures and on the ignition of gaseous mixtures by the electric discharge. Not the least valuable paper is one entitled "A Contribution to the History of Dyeing in Scotland," being a sequel to one in vol. vii. of the journal on the history of dyeing suggested by a remark of the late Prof. Meldola in his presidential address of 1910 to the Society of Dyers and Colourists on "The Antiquity of Tinctorial Art": "I have in mind the desirability of technical societies such as ours including in their work the antiquarian side of their subject. This is, as a rule, neglected. Nevertheless, it is desirable to secure records of the past with respect to ancient industries, and the experts in any particular subject are assuredly the right people to undertake such work." Other important articles in the current number deal with researches on the ultimate endurance of steel and of the results of experiments with lathe-finishing tools, a continuation of valuable experiments and investigations begun in the school so far back as 1903 on high-speed tool steels and cutting tools, which are even now under investigation; on modern boiler-room practice and the prevention or abatement of smoke; on the effect of structure on the strength and wearing qualities of cloth, copiously illustrated; on a null method of testing vibration galvanometers; and on the commutation of large continuous-current generators and rotary converters under heavy-load conditions.

The school is thus "an excellent example of the kind of work which the engineering colleges and the higher technical schools in this country ought to undertake, and must be prepared to perform, if they are to occupy the place of similar institutions abroad in the very important matter of practical research, not merely as teaching young men the elements of technical science, but also as establishments where industrial experiments can be carried out on a practical scale." It only remains to say, as exhibiting the great resources of this school, that the journal has been admirably printed and its illustrations prepared at the school press.

J. H. R.

PHYSIOLOGY AT THE BRITISH ASSOCIATION.

THE attendance of physiologists at the Newcastle meeting was comparatively small, but there was a good programme, and several of the papers elicited considerable discussion. Prof. Cushny, the president of the section, took a pharmacological subject for his address. Reports of research committees were then presented, and Prof. Waller exhibited a simple apparatus for the administration of known percentages of chloroform. The recent modifications suggested by the extensive use of the instrument were described.

A series of lantern-slides illustrating the action of pituitary extract on the secretion of cerebro-spinal fluid was shown by Prof. Halliburton. The increased secretion is claimed by him to be an indirect result of the extract, the immediate cause being ascribed to stimulation of the cells of the choroid plexus by an increased quantity of CO_2 in the blood.

Prof. W. H. Thompson detailed the results of further investigations into the formation of arginine and creatine. An interesting paper by Prof. Cushny on the secretion of urea and sugar by the kidney was the outcome of a repetition of Heidenhain's experiments with this difference, that urea in some experiments, and sugar in others, were injected instead of a dye into the blood of an animal after transection of its spinal cord. Analysis of the kidneys after a suitable interval showed no increase of urea or sugar in them above the normal, and there was therefore no accumulation of these substances in the cells of the convoluted tubules.

Prof. Herring gave the results of several series of experiments in which white rats had been fed on small

doses of fresh thyroid for various periods of time. The administration of 0·2 gram of fresh ox thyroid in the food daily for one month led to a 75 per cent. increase in the weight of the suprarenals, and a 50 per cent. increase in their adrenalin content. Further, there was great hypertrophy of the heart, especially of the ventricles, the weight of the heart being double, and in some nearly treble, the weight of the heart of control animals. The kidneys were also enlarged, though not to the same extent. Prof. Herring directed attention to the similarity in the condition produced in white rats by small amounts of thyroid to the condition sometimes found in "soldier's, or trench, heart" in man, and suggested that cardiac hypertrophy, associated with excessive production of adrenalin and changes in other organs, might sometimes be caused in man by over-action of the thyroid glands. A paper by Dr. Kojima followed, in which changes in the pancreas induced by thyroid-feeding were illustrated by lantern-slides. The pancreas of thyroid-fed animals showed numerous karyokinetic figures, and alterations in the amount of secretory granules in the cells.

In the discussion which followed these two papers Sir William Osler, Sir Edward Schäfer, Prof. Drummond, and Prof. Moore took part.

On Friday morning, September 8, Dr. Itagaki described the action of ovarian extracts, more especially of luteal tissue, on preparations of uterine and intestinal muscle.

A paper by Prof. Bayliss on "The Properties Required in Solutions for Intravenous Injection" was read, in which the author recommended the use of a 7 per cent. solution of gum acacia. Such a transfusion fluid has a viscosity, and exerts an osmotic force, more nearly resembling blood plasma than normal saline, and when used in cases of hæmorrhage gives better results.

Prof. Moore and Mr. Barnard gave a paper on the nutrition of living organisms by simple organic compounds.

The meeting closed with a discussion upon "Food Standards and Man Power," introduced by Prof. Waller. The object of the discussion was to prepare the way for the formation of a committee to formulate definite figures for the value of work done by man, woman, and child.

THE BRITISH ASSOCIATION AT NEWCASTLE.

SECTION H.

ANTHROPOLOGY.

OPENING ADDRESS (ABRIDGED) BY R. R. MARETT, M.A., D.Sc., PRESIDENT OF THE SECTION.

THE question to which I beg to direct attention on the present occasion is: What function ought anthropology to fulfil among the higher studies of a modern university? The subject may be commonplace, but it is certainly not untimely. At the present moment those of us who are university teachers in any of the warring countries are feeling like fish out of water. Our occupation is to a large extent suspended; and already it seems a lifetime since we were assisting, each after his own fashion, in the normal development of science.

"Usus abit vitæ: bellis consumpsimus ævum."

Can the hiatus be bridged, the broken highway mended? Never, if memories are to prevail with us; but if hopes, then it goes equally without saying that we shall somehow manage to carry on more actively and successfully than ever. So the only problem for brave and hopeful men is, How? Ignoring our present troubles, we are all thinking about the future of university education, and reform is in the air.

Of course, every university has difficulties of its own to meet; and my own University of Oxford, with eight centuries of growth to look back on, is likely to be more deeply affected by the sundering of traditions due to the war than such of its sister-institutions as are of more recent stamp. Now, when I discuss university matters, the case of Oxford is bound to weigh with me predominantly; and, indeed, no man of science could wish me to neglect what, after all, is bound to be my nearest and richest source of experience. But various kind friends and colleagues hailing from other universities in Great Britain, France, and the United States have furnished me with copious information concerning their home conditions, so that I shall not altogether lack authority if I venture to frame conclusions of a general nature. Besides, it is not on behalf of any university, but rather as representing the interests of the science of anthropology, that I am entitled to speak in my present capacity. I do indeed firmly hold that anthropological teaching and research can be admitted to the most ample status in the curriculum of any modern university without injury to established industries and activities. But, even if this were not so—even if it needed a sort of surgical operation to engraft the new in the old—we anthropologists must, I think, insist on the fullest recognition of our science among university studies, realising, as we are especially able to do, its immense educational value as a humanising discipline. Let me not, however, rouse prejudice at the outset by seeming to adopt an aggressive tone. "Live and let live" is the safest motto for the university reformer; and I have no doubt that the peaceful penetration whereby anthropology has of late been almost imperceptibly coming to its own in the leading universities of the world will continue to accomplish itself if we, who make anthropology our chief concern, continue to put forth good work in abundance. For, like any other science, the science of man must be justified of its children.

Now, it is customary to contrast what are known as technical studies with university studies proper; and such a distinction may prove helpful in the present context, if it be not unduly pressed. Thus, in particular, it will afford me an excuse for not attempting to travel afresh over the ground covered by Sir Richard Temple in his admirable presidential address of three years ago. What he then demanded was, as he termed it, a school of applied anthropology, in which men of affairs could learn how to regulate their practical relations with so-called "natives" for the benefit of all concerned. Let me say at once that I am in complete agreement with him as to the need for the establishment or further development of not one school only, but many such schools in this country, if the British Empire is to make good a moral claim to exist. Indeed, I have for a number of years at Oxford taken a hand in the anthropological instruction of probationers and officers belonging to the public services, and can bear witness to the great interest which students of this class took at the time, and after leaving Oxford have continued to take, in studies bearing so directly on their life-work.

What I have to say to-day, however, must be regarded as complementary rather than as immediately subsidiary to Sir Richard Temple's wise and politic contention. The point I wish to make is that, unless anthropology be given its due place among university studies proper, there is little or no chance that technical applications of anthropological knowledge wil