

Chemical Industry and Technical Institutions.

MR. W. J. U. WOOLCOCK, general manager of the Association of British Chemical Manufacturers, delivered a striking address to the annual conference of the Association of Teachers in Technical Institutions which was held at Plymouth on June 4-7. Dealing with technical education and industry, he illustrated his theme by reference to chemistry, pure and applied. With this in mind, he traced the growth of the British chemical industry, which is now, he said, among the six greatest industries of the country; £200,000,000 capital is invested in it; it employs a quarter of a million workers and is exceedingly well organised. Not very long ago its range was small and, in Great Britain, relatively unimportant: to-day it provides the largest field for the scientific chemist. It has made greater strides in its post-War development than any other British industry, and is of such a wide character that it is difficult to set limits to its boundaries.

Three new points are, however, to be noted. While at one time chemical industry was practically the only outlet for the trained chemist who desired to apply his knowledge to industry, there is now no industry which cannot be benefited by the application of scientific knowledge to its control and development. There is, therefore, an almost unlimited field for the technically trained man or woman. Again, the post-War developments have been specially remarkable. Actually, of course, we have always had some sort of chemical industry in Britain, but what is called chemical industry is really an aggregation of a number of industries in many of which we have held our own for more than half a century. Particularly is this true of what are known as the heavy chemical industries. But since the War we have developed and maintained the fine chemical industries such as dyestuffs (the Dyestuffs Act helped considerably), research, medicinal, and photographic chemicals. We are therefore able to speak now with America, Germany, France, or Switzerland in brotherly terms, not in the terms of the poor relation.

There remains a third point, which refers to the boundaries formerly set between scientific and 'non-scientific' industries. Already it has been pointed out that there is no industry which cannot be benefited by scientific methods; it is also true that there is a number of industries doomed to extinction if such methods be neglected. "Thus," said Mr. Woolcock, "I say not only to the chemists here, but to the physicists, electricians, and especially to the biologists, that whatever industry you enter, or

whatever part you have to play in teaching those who may become industrialists, yours is a great vocation. I use no words of exaggeration when I say that the future of this country can be very largely influenced by what you can do." He was not concerned at the moment, he said, with the philosophical implications of technical education. He wanted to look at it from the viewpoint of what sort of men and women it produces—a test upon which technical teachers should be prepared to be judged. After all, the business man has to fit the product of teaching into the realities of his business. He can therefore recognise its good results in his own practical affairs, and he is bound to notice what appear to him to be its deficiencies.

On the whole, the present system gives satisfactory results, but there remain certain deficiencies to be made good. Mr. Woolcock would suggest that there is not available a sufficient number of trained scientific persons who have been taught from the point of view of economy. It is possible to teach the principles of chemistry and engineering in such a way as to inculcate throughout those conceptions of efficiency with regard to expenditure on material, labour, wear and tear of machinery and plant, heat, light, power, and so forth, which are essential to industry. It may be replied that this is already being done in some measure; but it must become far more general and must start quite early in the training of young scientific workers. An important aim, too, of technical education is the acquirement of ability in experiment, and by this is meant not only manipulative skill, but also imaginative conception. The teaching of manipulative skill is bound to vary in quality in accordance with the standard of the teacher. That cannot be avoided, but it is still possible that manipulative skill and manipulative conception can be developed in all their bearings from the point of view of their quantitative efficiency. From this it seems to follow that there is need to widen the scope of technical education. It might usefully include administration, costing, and production.

In his sketch of the development of the chemical industry, Mr. Woolcock said that, following the addition of fine to the heavy chemical industries, another development is taking place right under our eyes. It is a development along lines of production in enormous quantities of commonplace articles. "Undoubtedly," he said, "the industry has provided a bigger outlet than any other in the country for your students."

The New Experimental Station of the Safety-in-Mines Research Board.

THE official opening on June 14 of the new Experimental Station of the Safety-in-Mines Research Board at Harpur Hill, near Buxton, is an event of much importance in the mining world. It was fitting that the ceremony should be performed by Lord Chelmsford, chairman of the Miners' Welfare Fund Committee, and should be welcomed in no uncertain tones by Mr. Herbert Smith, president of the Miners' Federation.

Lord Chelmsford, in his speech, made it clear that the assistance of the Welfare Fund had only been obtained on two conditions: (1) that the nature and locality of the Station should be approved by both the owners and miners, and (2) that the experimental plant and its scientific equipment should be the best that could be designed for the purpose. When the Committee was unanimous on these two essentials it

had no difficulty in allocating a large capital sum for acquiring and equipping the site at Harpur Hill for the experiments which could only be carried out on a large scale, and for erecting at Sheffield buildings for laboratory researches especially connected with the properties of coal and with improvements in the miners' safety lamp. Besides this capital expenditure, an endowment fund of £250,000 had been invested to provide an annual income for the purposes of research.

The Committee, Lord Chelmsford added, did not suppose that immediate practical results would follow from a few scientific experiments; it is realised that the problem of securing safety in mines becomes more and more complex as the workings are extended, and it is only by the most patient research—not by one man, but by a trained staff working under skilled