INDUSTRIAL RESEARCH IN ONTARIO AND PRUSSIA COMPARED

THOSE who treat lightly the industrial research of this continent and lavish overdue praise on the research of Germany do not use a standard of measurement—a unit of population in the present case—for the comparison, which through the omission becomes a mere arbitrary opinion. A common example of this laxity is the remark of one who was speaking of the United States and Canada: "Progress along advanced industrial lines has not hitherto paralleled that of Germany." Scrutiny of the statements of such writers on industrial research always fails to show any trace of a standard used in their comparisons, and it is with a view to supply what they omit that the following particulars are compiled:

In 1909 the Ontario government commissioned Dr. John Seath to report upon industrial education, and the report he submitted ("Education for Industrial Purposes"), bearing date 1911, contains some of the latest statistics on technical education before the war, and also contains incidentally some information on the allied subject of industrial research. In particular, he gives a list (p. 161) of the thirty-three technical "schools" of university rank in Prussia which are in a position to undertake research work. This list for Prussia has more details than the similar list in the "Encyclopædia Britannica" (1910–11), which relates to the whole of Germany. The Prussian list consists of the following: nine technical schools, or polytechnica, of which the one at Charlottenburg is the chief example; three mining academies; five forest academies; four agricultural academies; five veterinary "high schools"; five commercial "high schools"; two schools of art.

Junior industrial schools and technical schools of the middle class, the former with state contributions of 38 per cent., the latter with 54 per cent., were educational, not research institutions, and did little work in research, compared with those of university rank given above. If, therefore, we add to this list of 33, the nine medical schools, which are connected with universities in Prussia, and which are doing the public laboratory work—omitting the literary faculties of law, divinity and philosophy in the universities, which are negligible in an enquiry relating to science—we get a complete census of the 42 Prussian institutions that do advanced research work. On a basis of population of 42 millions then in Prussia, we find one such institution for every million people.

Next, consider the case of Ontario, where, as in Prussia, such institutions are mainly provincial or state, and not federal. Following the same order, Ontario has: two schools of applied science and engineering ("polytechnica"); two mining schools doing assay work for the mining industries; one forestry school; one agricultural college at Guelph, doing research for the past forty years (the Ottawa college being federal). The bulletins and reports from Guelph have numbered several thousands. One veterinary college, established in 1862 as a private enterprise when there were very few on this continent, and taken over by the government of Ontario in 1908. Three laboratories, the central at Toronto, with branches at Kingston and London, Ontario, viz., one at each medical college, doing public analysis like those of the Prussian medical colleges. (The federal laboratory at Ottawa deals with adulterations.) One meteorological research observatory for industries, and especially for agriculture and the shipping industries. It is now supported by federal funds but was originally a local institution in Toronto. (The agricultural academies attend to this line of research in Prussia, the meteorological institute in Berlin being mainly a collecting point.)

This aggregate of eleven government institutions of research for the industries of Ontario, on the basis of two and three quarter millions of population at the outbreak of the war, makes a total of four per million people, or four times the number in Prussia for the same unit of population (one million). In making this comparison where the number of institutions of research for the industries is the criterion, there is no separation of research for specific problems from research for

the general benefit of industries, as the two are so closely associated.

Comparisons of data on the numbers of officials and instructors employed, students trained (where it is a teaching institution), and public money expended, when referred to a population basis, would reveal for Ontario, if space warranted their publication, similar favorable results. And it would be easy to cite other provinces and states on this continent comparing favorably with Prussia.

It is not difficult to understand why the faith in German and Prussian "greatness" in research has become so general in America, as it was the privilege of the Germans themselves, as usual, to bell the cat. In November, 1915, a debate took place in the Reichstag over the spending of 40,000,000 marks in propagandist work in the United States of America, and a socialist member asked what good they had received from it. The outlay involved liberal sums for illustrated articles on the industrial training institutions of Germany, inserted in United States illustrated journals which circulate also in Canada. While the propagandists knew the value of advertising, many who read the articles and still derive their arguments from them failed to understand that it was advertising matter. Whatever progress Germany made was due to the application of science to the industries, and no right-minded person would begrudge them peaceable success, if their international politics had been just.

It is not surprising to find that research had been along different lines in Prussia and in Ontario, their material being received here in exchange mostly for well-developed agricultural products. The war changed this, and in a propaganda of the manufacturing classes to throw the burden of research upon the public, paid for out of the public treasuries, it is well to bear in mind the reasonable plan adopted in England of granting a pound of government aid for every pound expended by private enterprise.

A. F. HUNTER

NORMAL SCHOOL BUILDING,
TORONTO

SCIENTIFIC EVENTS

THE LONDON IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

WE learn from the London *Times* that past and present students of the Imperial College of Science and Technology at a mass meeting in the Imperial College Union, on January 29, decided, with only one dissentient, to sign a petition urging the governors of the college to take immediate steps to raise the status of the college to that of a university of technology, distinct from the University of London, and empowered to confer its own degrees in science and technology.

The petition expressed the opinion that the recognition of the Imperial College as an institution of university rank should be one of the earliest items in the program of legislative reconstruction, and that his majesty's government should give every encouragement to students who desire to devote their lives to science and technology.

Mr. Herbert Wright, one of the governors of the college and a past student, who presided, said they were concerned with the future of the students and the future status of the Imperial College of Science—matters of supreme importance not merely to themselves and those who would succeed them, but indirectly to the whole of the British Empire. The legitimate demand of the day, especially prominent in the City of London, was that there should be established a very close relationship between scientific research and industry. Furthermore, many of them held the view that no honor was too great, no distinction too high, for students who, by the application of scientific principles to the problems of daily life, increased the wealth and power of the British Empire, and added to the grand total of this world's happiness. Industrial concerns in London were strongly in favor of giving full encouragement and the highest recognition to men and women who devoted their lives to scientific and industrial research. They could rest assured that this college had been, and was still, the principal source of supply of technologists to those in charge of industry in the City of London.