

their work or advice. What wonder, then, that the public, which sees through this kind of thing, should tend to despise, not only scientific men, but science itself?

It is idle to disguise the fact that recent events have filled most educated persons with a sense of extreme resentment against the administration of this country—a resentment which I have heard expressed by numbers of persons—civilians and soldiers. It is felt by many (and I am one of them) that we live under the rule of the invertebrates. The people who administer the country are not the best, the most vigorous, and the most sagacious of men. They are too often the time-servers and the mediocrities. The maladministration of scientific affairs is only one of the many forms of maladministration; but, on the whole, I think it is perhaps the most important form, because it gives to the mind of the whole nation a lower, a meaner, and a thoroughly sentimental and unpractical turn. For more than half a century before the war England has ceased to be an intellectual nation; the public at large has remained indifferent to science, art, literature, invention, and all the great intellectual pursuits, and has given itself up to game-playing, party politics, faddism, and a debased drama. We are now paying the penalty, and, if I do not mistake, will have to pay a heavier one before the end. If we have produced great men their names are unknown to the multitude, while the wire-pullers, the sentimentalist, and the hypocrites sit on high. That is my own summing up of the British nation of to-day—and I know that many agree with me. I am also of opinion that when our soldiers return from this war there will be something very like a revolution against the class of men who at present misgovern us in almost everything.

Sir William Crookes suggests a Ministry of Science and representation of science on the Privy Council. But in the light of our present experience are these likely to help us in any way? The Board of Education was appointed partly for this purpose, and what does it do for the worker? It has formulated a contributory pension scheme, but I believe nothing else. The able editorials in NATURE of November 24 and December 2, 1915, well define the position of science in this country to-day; but no reform is likely to be effected so long as men of science themselves do not insist upon it. What is required is a small association of strong men banded together for the express purpose of forcing the pace without fear or favour, and in spite of twaddlers who now paralyse all efforts at improvement. I would suggest at once the following programme:—

(1) Direct payment by the State for non-remunerative scientific work which has been of benefit to the public at large.

(2) Invariable payment by Government departments and public bodies for all scientific expert advice or assistance whatever.

(3) No issue of Government grants for expenses of researches without a fixed payment of, say, 50 per cent. to the workers themselves for their expenditure of time on the work.

(4) Control by the State over the sweating system now employed by universities and numerous public bodies in connection with scientific workers of all kinds.

Sir William Crookes thinks that our national attitude towards science "can only be rectified slowly, step by step." But war is a rapid arbiter, and the sword does not wait for the armour to be girded on. If I mistake not, we have not much time left for repentance.

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NO. 2411, VOL. 96]

### Germany's Supplies of Nitric Acid.

AN article in the *Times* of January 6 deals with the resources in Germany for producing nitric acid. Formerly, the major part of the world's supply of nitrates came from the *caliche* beds on the west of the Andes, but of recent years, as is well known, nitric acid and nitrates have been manufactured by the electric process of Birkeland and Eyde in various parts of Norway. Franck and Caro, some years ago, introduced a process whereby ammonia can be produced from calcium carbide, after conversion into calcium cyanamide. The Ostwald-Kaiser process of partially oxidising ammonia by passing it along with air over platinum or other contact substances, afforded a practical means of producing cheap nitric acid. Then the discovery of Haber and Le Rossignol, that nitrogen and hydrogen could be combined in presence of contact agents under high pressure, and at moderate temperatures, made it possible to synthesise ammonia more cheaply than it could be obtained by recovery from gasworks liquors.

It is understood that the German Government subsidised the Badische factory to the extent of 100 million marks at the beginning of the war, so that no shortage in their supplies should occur. They claim to be producing sulphate of ammonium, according to Mr. D. Milne Watson, at the rate of 300,000 tons a year, and it is not impossible, provided they can get sufficient sulphuric acid. Mr. A. E. Barton, who has just returned from a visit to Norway and Sweden, learned that the increase in the Badische Company's output of ammonium sulphate was 200,000 tons; they had formerly manufactured 150,000 tons a year. Plant of 10,000 h.p. is being erected, too, in Westphalia, to produce ammonia by the carbide process; the result is expected to be the production of 200,000 tons of concentrated nitric acid a year. Other two works, one in Bavaria, and the other near Cologne, produce between them 45,000 tons of cyanamide.

Had our Government taken the steps which were urged upon them in August, 1914, to prevent Chile saltpetre from entering Germany, in all probability there would have been a shortage of nitric acid in Germany. That shortage is now not likely to occur.

W. R.

### National Technical Training.

WITH reference to the recent leading articles dealing with the position of science and industry in this country, attention may usefully be directed to the system under which the work of the smaller technical schools is conducted.

At present it is generally admitted that our workpeople are not very scientific, and their trades unions do not appear to realise how much might be done if the various industries had colleges of their own. The only chance a workman has therefore of learning the technical portion of his business is by attending evening classes at the smaller technical colleges, and it is with these schools I would like to deal, since the subject is now of considerable importance.

At most of these places so many subjects are taught that they resemble museums of applied education more than anything else, and the principals in charge of them, and the inspectors who frequently inspect them, have generally no knowledge of *technical work*, or *business experience*. Why there are so many inspectors nobody knows, or what becomes of their reports. Further, the old system of examination has been given up, and "student hours" are made such a fetish, that I have seen classes opened and closed as many as seven times during a session; closed when one