



(c) crown copyright

Printed for the Cabinet. January 1956

SECRET

Copy No. 58

C.P. (56) 1

2nd January, 1956

CABINET

TECHNOLOGICAL EDUCATION

MEMORANDUM BY THE PRIME MINISTER

During the Recess I have been thinking over the problems of scientific and technological manpower and education, which are so vital to the future of this country. I attach a note which Lord Cherwell prepared at my request. I think that there is much to be said for his suggestion that this whole complex and difficult topic should be urgently reviewed for us by a small high-powered committee, and should like the views of my colleagues upon this.

A. E.

*10 Downing Street, S.W. 1,
1st January, 1956.*

NOTE BY LORD CHERWELL

82

Britain will only be able to survive in the modern world if we can continue to sell at competitive prices manufactured goods equal in quality to those offered by other countries. We shall only be able to do this if our methods of production are better than those used by our competitors. If not, we shall have to consume less or the labour force will have to work longer hours or harder.

2. There is no need to stress the great shortage of scientists and technologists in the United Kingdom. Government establishments, industry and schools all tell the same tale; indeed at least one large firm has been reduced to trying itself to teach science to men with arts degrees after appointment.

3. Russia with only about four times our population has some 300,000 scientists and technologists in institutions of university status and a further 1,600,000 in institutions at least equal to our best technical colleges. Per head of the population we have only a fraction of these numbers in training.

4. How to set about increasing greatly the number of scientists and technologists is a complicated problem. Owing to the shortage it is very difficult to attract good men to teach science, whereas first class arts men are often glad to accept posts in schools. Moreover, the universities tend to give more scholarships for arts subjects than for science, and the most intelligent boys are in consequence induced by the schools to compete for these. Thus the best brains tend to be steered away from science. Men with arts degrees are produced in excess by the universities and there is a dearth of scientists and technologists. Hence we find few good science teachers and plenty of good arts teachers in the schools and the vicious circle is complete.

5. Our technical colleges are, it seems, good—some indeed very good; nevertheless they should be encouraged and perhaps further expanded. But technical colleges only teach the non-commissioned officers of industry. What the country is really short of is what might be described as the officer class, the really highly trained technologists such as exist in large numbers in other countries where the applied scientists are trained in technological universities like Massachusetts Institute of Technology, Zürich, Charlottenburg and so on. To produce anything like the number we need, technological universities of equal standard and status should be built up here. The Cabinet decided that this should be done more than three years ago.

6. Since then, however, it has been argued that the available resources should be used in the main to foster technology in the universities. Nobody would desire to abolish engineering teaching in universities; indeed there is no doubt a case for expanding and improving the teaching of the applied sciences there. But it is clear that only a fraction of the numbers we require can be produced in this way.

7. People are all too apt to think that technology is just engineering. But this is only one of the branches. Besides civil engineering, mechanical engineering, heavy electrical and light electrical engineering, electronics and chemical

engineering, there are vast branches of technology concerned with textiles, plastics, ceramics, glass and the like which are all vital to industry. To teach these properly dozens of departments and scores of professors are required. And to superimpose these on to many of our universities would not only be vastly extravagant, but would throw the whole university out of balance. Every other civilised country trains the bulk of its technologists in great institutions of university status and rank, conferring degrees, including doctorates, and generally enjoying all the prestige and privileges of ordinary universities.

8. If we are to have numbers comparable with the technologists trained abroad, the great bulk will have to be educated in similar technological universities in which the emphasis is on the various forms of applied science without, of course, neglecting ancillary subjects such as economics, law and languages.

9. In order to attract the best men it is vital that these institutions should have absolutely equal rank with the universities. To ensure this they must be treated not like technical schools and colleges but like the ordinary universities, *i.e.*, financed by the Treasury through a technological University Grants Committee.

10. But the development of technological universities is only one aspect of the problem, though probably the most important. Of similar moment is the need to increase and improve science teaching in the schools, which is partly the responsibility of the Ministry of Education and partly the task of the independent schools which for a long time to come are likely to attract the best pupils. Then there is the question of improving the technical colleges. And there is the very important matter of the relation of all these institutions to industry. None of these problems can be treated in isolation. The many possible solutions must be dovetailed together in one comprehensive overall plan.

11. To produce the outlines of such a plan it would seem advisable to set up a very small high-powered committee like the one under Lord Waverley which worked out in broad outline the best way of transferring atomic energy work from the Ministry of Supply to the Atomic Energy Authority. Like that Committee it would report, at least in the first place, privately to the Government. It might be instructed by the Cabinet to outline a scheme for producing the large numbers of scientists and technologists the country needs, which will no doubt involve the creation of special technological universities. Such a committee should be able to report in two or three months.

12. We have seen how quickly Germany with her army of technologists has recovered from the catastrophic damage inflicted by the war. Russia with her enormous man-power and vast mineral resources may well in 30 or 40 years overtake and even dominate the West if she is allowed to build up a similar preponderance. Unless Britain takes speedy action she seems doomed to sink in wealth and influence to the level of Portugal within a generation.

C.

28th December, 1955.