Mr. Wilson said: It was here at Scarborough, three years ago, that we began the hard climb back from the 1959 Election defeat with a debate, also on the Tuesday morning of that week, on Morgan Phillips's document *Labour in the Sixties*; and anyone here then will, I think, always treasure the memory of that great speech of Ray Gunter, opening that debate. When I came to wind up that debate, I said then that we must harness Socialism to science, and science to Socialism. That, again, was one of the main themes of *Signposts for the Sixties*—the mobilisation of all the resources of science available to us in this new scientific revolution.

Now, this morning, we present this document to the nation, Labour and the Scientific Revolution, because the strength, the solvency, the influence of Britain, which some still think depends upon nostalgic illusions or upon nuclear posturings—these things are going to depend in the remainder of this century to a unique extent on the speed with which we come to terms with the world of change.

There is no more dangerous illusion than the comfortable doctrine that the world owes us a living. One of the dangers of the old-boy network approach to life is the thought that it is international, that whatever we do, whenever we run into trouble, we can always rely on a special relationship with someone or other to bail us out. From now on Britain will have just as much influence in the world as we can earn, as we can deserve. We have no accumulated reserves on which to live.

And if there is one theme running through this Conference this week—Fred Hayday stressed it on Sunday night in the first speech from this platform which set the keynote for all of us and Ray Gunter stressed it again yesterday—it is the theme of change, the overdue need for this country to adapt itself to different conditions. It is the theme and the challenge which faces the Labour Party, which faces every one of us.

It is, of course, a cliché that we are living at a time of such rapid scientific change that our children are accepting as part of their everyday life things which would have been dismissed as science fiction a few years ago. We are living perhaps in a more rapid revolution than some of us realise. The period of 15 years from the last time we were in Scarborough, in 1960, to the middle of the 1970s will embrace a period of technical change, particularly in industrial methods, greater than in the whole industrial revolution of the last 250 years. When you reckon, as it is calculated, that 97 per cent of all the scientists who have ever lived in the history of the world since the days of Euclid, Pythagoras and Archimedes, are alive and at work today, you get some idea of the rate of progress we have to face.

It is only a few years since we first in this Conference debated automation, when almost every word uttered in that debate is already as out of date today as if we had been talking about the advent of the spinning jenny. Automation is beginning to make its impact felt in quarters of British industry, as many delegates here know—the engineers, the technicians, the chemical workers, the scientific workers, and, not least, the Post Office workers and the Post Office engineers, who have pioneered some of the major developments in automation and who, thanks to the combination of our trade union skill and of public ownership in the Post Office, lead the world in these developments.

Let us be frank about one thing. It is no good trying to comfort ourselves with the thought that automation need not happen here; that it is going to create so many problems that we should perhaps put our heads in the sand and let it pass us by. Because there is no room for Luddites in the Socialist Party. If we try to abstract from the automative age,
So the choice is not between technological progress of the kind of everyday-going world we are living in today. It is the choice between the blinding imposition of technological advance, with its weapons of mass destruction and its conscious, planned, purposed use of scientific prowess to provide undeserved comfort and living standards and the possibility of leisure ultimately on an unbelievable scale.

That is why we must, in the Labour Party, devote a lot more thought to providing facilities for the use of leisure, and this is why again, as this document suggests, we shall have to be a lot more imaginative about the provision for entraining the workers made redundant by the development of new skills and new techniques.

Now I come to what we must do, and it is a fourfold programme. First, we must produce more scientists. Secondly, having produced them we must be a great deal more successful in keeping them in this country. Thirdly, having trained them and kept them here, we must make more intelligent use of them when they are trained than we do with those we have got. Fourthly, we must organise British industry so that it applies the results of scientific research more purposefully to our national production effort. These, then, are the four tasks: first, more scientists—we are simply not training anything like enough for the country's needs. Russia is at the present time training ten to eleven times as many scientists and technologies. And the sooner we face up to that challenge the sooner we shall realise what kind of a world we are living in.

I know, of course, that a Government Committee has said that we shall have all the scientists we need by 1965. Of course we shall have all the scientists we need by 1968. But to provide the training to keep the scientists we are going to need will mean a revolution in our attitude to education, not only higher education but at every level. I do not want to anticipate the debate on education, but it means that as a nation we shall have to add about 30,000 new jobs gross, making no less than 180,000 and 200,000 places in our universities, and the Government's plan provides for only 75,000—75,000—that is only to get back to the same standards of entry as we had in the late 1930s; and in the late 1950s our aim was too small; we were near the bottom of the international league. This is why we must lead the world in the education of our children.

As Socialists, as democrats, we oppose this system of a purely educational apartheid, because we do not believe in equality of opportunity. But that is not to say we are simply content as a realistic affair shall—if we do not use them. We shall have all the scientists we need by 1968. But to provide the training to keep the scientists we are going to need will mean a revolution in our attitude to education, not only higher education but at every level. I do not want to anticipate the debate on education, but it means that as a nation we shall have to add about 30,000 new jobs gross, making no less than 180,000 and 200,000 places in our universities, and the Government's plan provides for only 75,000—75,000—that is only to get back to the same standards of entry as we had in the late 1930s; and in the late 1950s our aim was too small; we were near the bottom of the international league. This is why we must lead the world in the education of our children.
and colleges of higher education. They propose, and every one of us must accept, a tremendous building programme of new universities and of this new higher education, and so see that more of them are situated in industrial areas where they can in some way reflect the pulsating thrift of local industry, where they can work in partnership with the new industries we seek to create.

Not enough thought has been given, when we fight against the problem of declining areas and the migration of population away from some of our older areas, to the establishment of new universities who, by the very nature of their industrial research, can help to revitalize areas in which they are going to be sited. As Lord Taylor said in the report, our aim must be to establish the earliest possible moment to provide facilities for higher education for at least 10 per cent of our young people, instead of the 5 per cent at which the Tories are traditionally aiming.

There is another thing we have got to do in the field of higher education, and this is to put an end to smobbery. Why should not the colleges of advanced technological education degrees? Why should not teachers training colleges be given more and more their proper place in the educational system? You know, what is needed here is not to happen by chance. We are going to need a Ministry of Higher Education. You can argue about whether you link it with the existing Ministry of Education, whether you link it with the new Ministry of Science or, as may be right, combine it with a Ministry in its right under a Minister of Cabinet Office. You can all argue away this.

The important thing is that the Ministry of Higher Education must become the focal point of the planning of higher education in this country.

Again, also, these problems are our plans for a university of the air. I repeat again that this is not a substitute for our plans for higher education, for our plans for new universities, and for our plans for new technological education. It is not a substitute; it is a supplement to our place. It is designed to provide an opportunity for those who are not only one, or another, or have not been able to take advantage of higher education, as we do so with all the TV and radio and the State-sponsored correspondence course, and the facilities of a university for setting and marking papers and conducting examinations, in awarding degrees, can provide. Nor, may I say, do we envisage this merely as a means of providing scientists and engineers, we believe a properly planned university of the air could make an inestimable contribution to the cultural life of our country, to the enrichment of our standard of living.

Mr. Chairman, because this morning we are talking about science, I have been referring so far to plans for training scientists, but of course such a programme of higher education expansion programme will not be confined to the facilities that are available in this country, but will extend beyond them, and beyond their place in the development, because the development of higher education based purely on the training of scientists and technologists would, of course, fail to meet the full human requirements of our nation. Secondly, we must hold our scientists in this country. The Royal Society has recently reported that 12 per cent of new Ph.D.s are now leaving this country every year to go abroad. We have heard recently of universities where practically all the whole scientific staff and students that have emigrated are active in the nuclear weapon industry. Only the other day I heard of one of our most famous scientific colleges where in one particular faculty nine Ph.D.s have been awarded this year in a field which is so relevant to the future of Britain as any subject I could think of, and of those nine, seven have already left to go to the United States. Lord Hailsham tells us that this loss of scientists is due to the deficiencies of the American educational system. His Lordship is wrong. It is due to the deficiencies of the American educational system; it is due to the deficiencies of the British industrial system, in that we do not provide a proper valuation on our trained scientists, that they are not afforded the status and the prospects to which they are entitled.

I have talked in America to British scientists who leave us because there is too much a question of salary; it is the poor valuation on their work by British industry and in some cases British universities, the inadequate provision of adequate research facilities and equipment. It is because in so many cases in British industry today promotion for a scientist depends on waiting for dead men's shoes. Britain is not so rich in facilities for training scientists as some of the great scientific laboratories that we can list in this brain drain capital. We are not even selling the seed corn; we are giving it away.

One message I hope this Conference can send out, not only to those who are watching this, but to those who have already emigrated, is not to stay here. We want those of you who have left Britain to think about coming back, because the Britain that is going to be is going to be a different one.

So the next point is that we must make a more intelligent use of our scientists when we have them in the country, and the recent report on the work of our trained scientists were engaged in defence projects or so-called defence projects. Real defence, of course, is essential. But so many of our scientists were employed on purely prestigious projects that never left the drawing board, and many more scientists are deployed not on projects that are going to increase Britain's scientific output, but on some new gimmick or additive to some consumer product. We must, in fact, ensure that advertising managers push to the television screen to tell us all to buy a little more of something we did not even know we wanted in the first place. This is not strengthening Britain.

Scientific research in industry needs to be very purposedly organized. This is one reason why we are going to establish a full Ministry of Science; not what we have today—an office of the Minister for Science, with no powers, no staff, no scientists, no clear direction of where he is going. The Labour Party has been saying for years, that we have got to get a proper organization and a proper sponsorship of scientific research in this country, and we are now having to take the support, the powerful if belated support, of the Federation of British Industries in their recent report to the British Government.

So now I come to the fourth point, the vital issue of applying the results of scientific research in industry, because—let us be clear—unless we can harness science to our economic planning, we are not going to get the expansion that we need. Of course, the Labour Party welcomes the Government's conversion to the idea of economic planning. We have been pressing for this for years. We welcomed the signs of conversion, of repentance, two years ago, when they told us about this. We must warn the Government that planning pieces of paper targets alone, planning which requires for its enforcement any monetary regulation and manipulation of the tax system, is not going to produce the changes we need in British industry which we shall require if we are to expand the production by year by year, without running into an export/import which is a major obstacle to the economy of the last 12 years. We have become the handicap to the industry, and we are not going to turn round the economy before we turn into the commercial phase and the economic stability of the old days. The real issue is that this is a narrow one. Monetary planning is not enough. What is needed is structural changes in British industry, and we are not going to achieve those structural changes on the basis of short-termism, by every four years in your industry, or in the hope of just selling the country to the affluent society in the highly developed markets of Western Europe. What we need is new industries and our old industries, and we are going to be concerned with the job of the next Government to see that we get them. This means mobilizing scientific research in this country in producing a new technological breakthrough. We have spent thousands of millions in the past few years on unproductive research and development contracts in the field of defence. If we were now to use the technique of R. and D. contracts in civil industry I believe we could within a reasonable period of time establish new industries which would make us once again one of the foremost industrial nations of the world. We know this can be done. The National Research Development Council set up by the Labour Government, with total funds of only £5 million, has already produced new industries based on State sponsored research. What we now need to do and what we are committed to doing is first, carefully to expand the scope of this research development and, secondly, to ensure that new industries are established on the basis of State sponsored research the State will control the industries which result.

There are today groups of scientists in our universities, in N.R.O.C. and in public and private industry who are frustrated because they are not being used. Harwell and Capenhurst are running down and hundreds of trained technicians will be redundant. The cancellation of missile contracts is freezing for pro-

research work scientists and technicians who are both highly qualified and used to working in research teams. So why, Mr. Chairman, should we not give to these scientists, or, if you like, to groups of young scientists fresh from universities, the chance of producing a feasibility project study leading to full-scale Government research and development con-

tracts. There are delegations here with experience in the whole range of British industries, who know that if we could mobilize these scientists on research projects of this kind, we could within a very short period produce a major breakthrough in a number of fields: perhaps some new breakthrough in marine propulsion, in aircraft guidance, in transport, in electronics, in agriculture, or textile machinery. Some of these projects may involve the expenditure of millions of money, but will provide Britain with new industries which with which to compete anywhere in the world.

Yesterday we were talking about moderniza-

tion in transport. I remember seeing in a national newspaper two or three weeks ago the details of an imaginative new scientific approach to the problems of the railways. I do not know whether that is a winner or not. All I know is that it is not going on, through lack of money, and I know if somebody had made something equally imaginative, perhaps equally fanciful in the field of defence they would have had the money years ago to
push on with it. While we are not doctrinaires, while we are prepared to see the fruits of this sponsored research developed by public and private industry alike, and while we are prepared to establish productive partnerships between the public and private industries to exploit these research successes, we have a basic principle that the profits which result from such sponsored research should accrue in good measure to the community that created them.

These policies I think will provide the answer to the problem of Britain's declining industries and Britain's declining areas. We reject the Conservatives' solution of mass deportation of Britain's traditional industrial areas. Remember this: when we set up new industries based on science there need be no argument about location, no costly bribes to private enterprise to go here rather than there: we shall provide the enterprise and we shall decide where it goes. Some of our declining industries will be revitalised, not on a basis—and I want to make this plain, because this is not our policy—of uneconomic protection or subsidies, but revitalised by mobilising these industries for new tasks.

Let me give an example. Anyone who has discussed trade prospects with Soviet leaders, as many of us have, or with some of our great Commonwealth countries, knows that there is a great demand for new chemical industries based on British research. We have the best chemists in the world, but we have never mobilised to the full the possible resources of chemical engineering to enable us to ship complete factories to these areas on a scale commensurate with their needs and our capacities. For some reason in so many of our universities, while the chemist is excised the chemical engineer is told to go and set up below the belt. For some reason we have not developed the chemical engineering industry of this country on an adequate scale. The British Russians have talked to us, and they are moving fast.

Again we must relate our scientific planning to the problems of the war on world poverty. It is within the framework of advertising and the ceaseless drive to produce new and different variants of existing consumer goods and services, there is no thought given to the research that is needed to find the means of increasing food production for those millions in Asia and Africa who are living on the surface and below the poverty line.

It is very nice that we should be putting so much research into colour television, it is very nice that we should be putting all our energies into producing bigger and better machine tools to sell in Dusseldorf. What we should be doing is to develop the means of mass producing simple tractors and ploughs to increase food production. In an advanced world which has long by-passed the steam engine to the jet engine, to the means of propulsion we ought to be giving more thought to developing the research of this country for producing little simple one- or two-horsepower steam engines, because that is what the world needs, able to use local fuels, and capable of lifting water from that ditch to those fields a few hundred yards away. We must see the answer and the problem in Gallipoli. Two or 350 years ago when he said: 'Wherever could make two ears of corn or two blades of grass to grow upon a spot of ground where only one grew before, would deserve better of mankind and do more essential service to his country than the whole race of politicians put together.'

Again, Mr. Chairman, I should like to see the scientific departments of the new universities that we have been talking about mobilised to direct their scientific research to the special problems of underdeveloped countries, the needs of biological research to provide new breakthroughs in plant breeding, in the use of fertilisers, and in animal husbandry; in all the things that are needed to increase crops and to increase production.

Then again, what is the sense of closing down railway workshops that could provide the transport equipment that would make all the difference between poverty and solvency in newly developing countries?

Let us think big business about world development. We are going to establish a full-scale Ministry of Overseas Development, with a staff of Cabinet rank, to join with the Ministry of Science in mobilising Britain's scientific wealth for the task of creating, not the means of human destruction, but the means of human creation.

Mr. Chairman, let me conclude with what I think the message of all this is for this Conference. For this Conference, in all our planning for the future, we are re-defining and we are re-thinking, the problem of Communism in terms of the scientific revolution. But that revolution cannot become a reality unless we are prepared to make fundamental changes in economic and social attitudes which permeate our whole system of society.

The British that is going to be forged in the white heat of the revolution will be no place for repressive practices or for outdated methods on either side of industry. We shall need a totally new attitude to the problems of apprenticeship, of training and re-training for skill. If there is one thing where the traditional philosophy of capitalism breaks down it is in training for apprenticeship, where quite frankly it does not pay an individual firm, even if it is altruistic or quixotic or fascinated, to train apprentices if it knows at the end of the period of training they will be snapped up by some unscrupulous firm that makes no contribution to apprenticeship training. That is what economists mean when they talk about the difference between marginal private cost and net social cost.

So we are going to need a new attitude. In some industries we shall have to get right away from the idea of apprenticeship to a single firm. There will have to be apprenticeship with the industry as a whole, and the industry will have to take responsibility for it. Indeed, if we are going to end demarcation and snobbery in our training for skill and science why should not these apprenticeship contracts be signed with the State itself? Then again, in the Cabinet room and the board room alike those charged with the control of our affairs must be ready to think and to speak in the language of our scientific age.

For the commanding heights of British industry to be controlled today by men whose only claim is their aristocratic connections or the power of inherited wealth or speculative finance is as irrelevant to the twentieth century as would be the continued purchase of commissions in the armed forces by the sons of amateurs. At the very time that even the M.C.C. has abolished the distinction between amateurs and professionals, in science and industry we are content to remain a nation of Gentlemen in a world of Players.

For those of us who have studied the formidable Soviet challenge in the education of scientists and technologists, and above all, in the ruthless application of scientific techniques in Soviet industry, know that our future lies not in military strength alone but in the efforts, the sacrifices, and above all the energies which a free people can mobilise for the future greatness of our country. Because we are democrats, we reject the methods which Communist countries are deploying in attempting to meet the results of scientific research to industrial life, but because we care deeply about the future of Britain, we must use all the resources of democratic planning, all the latest and underdeveloped energy and skills of our people, to ensure Britain's standing in the world. That is the message which I believe will go out from this Conference to the people of Britain and to the people of the world.
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