In putting automation into practice, its very novelty, its unfamiliarity, is likely to arouse instinctive caution on the part of political parties and political leaders, of organized labour and of organized employers. If the situation is badly handled and the implications of automation are not made clear, the forces opposed to change may turn out to be very powerful. Nevertheless, the pressures of reality are so inexorable that I doubt if resistance on a really serious scale could last for long.

We have now reached a point where we could be moving into a golden age for the mass of human beings, with adequate food, shelter, clothing and amenities, and with the opportunity of developing their bodies and their minds to a degree that has never before been possible. The opponents of automation are basically people who are pessimists. Somehow, they do not believe that human beings can be trusted with riches and leisure. Tell them that here is a way in which we can all be better off, and they warn us solemnly, with a wagging finger, to beware of affluence. When the other fellow is well off, perhaps he will not be willing to work. I think this is against experience and in complete contradiction of all human striving.

To be in favour of more prosperity for everyone is not necessarily generous or altruistic. Under present circumstances it is self-interest and sheer common sense that drives us towards automation. We have no choice; we simply cannot opt out of it or deny its existence.

One of the greatest obstacles to getting automation into its proper perspective is that we persist in looking at it only in the context of present conditions. We find it difficult to relate it to the totally new social and industrial conditions in which it is eventually going to develop and establish itself. We often ignore the growing demand for more goods and services to meet the needs of a rapidly increasing world population and of the countries who are determined to increase their standards of living. If we place vastly improved production technology against no more than existing demand we do indeed get a picture which is frightening, but to think in this way is unrealistic. This is just one of the grave dangers of looking piecemeal at the coming age of automation. What we have to study is how this new era of technological advance and scientific knowledge can be matched by an increasing understanding of the importance of human values, and by an increase in the responsibility of government for the welfare of all the people.

If we try to see all the relevant factors in combination we get a picture which is much more reassuring than the one that presents itself to us if we concentrate only on the immediate plight of a particular workman in a particular factory, if that particular factory should happen to introduce advanced technological equipment. Much more than this is at stake. Any attempt to fossilize the present must inevitably lead to
industrial and economic collapse. But to get the new possibilities accepted there must be a national purpose, clearly and forcibly stated, integrating social justice with increased wealth. If the process of change is allowed to drift and to develop piecemeal, the situation could well become dangerous. If personal or governmental irresponsibility is regarded as an indication of freedom, or if, on ideological grounds, socialist or capitalist, the whole structure of our society becomes ossified at a time of great change, then the consequences could indeed be serious. This danger certainly exists, but I have hope that it will disappear sufficiently quickly for us to avoid disaster.

In talking on this question to a great variety of people for many years—trade union leaders, politicians, manufacturers, and social workers—i have found a widespread desire to understand the new trends and to act intelligently and responsibly for the common good. There are powerful negative forces at work, too, but they are usually to be found among people well advanced in years. I am convinced that the pressure from the younger people is nearly always in the direction of progress, although they want, rightly, to be convinced that the men of power and influence understand that progress does not consist merely of having more machines, and turning out more products from the machines, but that this greater usable wealth is for distributing among the great masses in the world and not only for the benefit of any particular section.

All parties are basically agreed that increased prosperity should be shared among people as a whole, although opinion about the best methods of achieving it may vary. Even in America, while right-wing groups maintain that the solution of all their ills lies in less governmental intervention, the responsibility of government for the distribution of created wealth is becoming steadily greater. For instance, the well-known economist, Mr Heller, was appointed by the President to head a commission to examine the consequences of automation upon the American economy A large and influential group of important academics and others drew the attention of the President to the need to change the traditional attitude, that those who do not work shall not eat. Whether we agree with this or not, we see in America, the most advanced and successful capitalist nation in the world, evidence of fresh, constructive thought. Worrying problems are being examined with great care and intelligence and many of the solutions proposed there are not reactionary, but progressive.

**Common Denominators for Communism and Capitalism?**

Under the influence of advancing automation we are beginning to see that the differences between capitalism on the one hand, and communism or socialism on the other, which have been dividing the world and inhibiting thought for so long, are at last beginning to diminish. Recent examination of changes in communist Russia indicates that under the impact of automation even communist dogma is beginning to undergo a reformation. Owing to the creation of a new technological class on a worldwide scale, orthodox political theories are now beginning to be amended, if not to crumble, and the process must inevitably continue. So it is possible that both capitalism and communism will find common denominators as a result of the forces let loose by the productive power of automation.
The political ideas which are based upon plenty instead of shortage must be different from those we traditionally call capitalist or communist. When we are able to increase wealth on such a vast scale, problems arise which cannot be solved easily by either of these two rather old-fashioned systems. From a battle for possession of wealth, limited by our present capacity to produce, we are moving into an era where we shall be much more concerned with the means of exploiting our technical resources, with increasing productivity still further, and then of necessity with the problem of the organization of society for the greatest good.

It is probable that there will eventually emerge a new type of political attitude, healthier and less selfish, which will seek a form in which it can best serve the whole of society, rather than a section of it. Politics, as we have understood them, are in the process of change, and party politics based on old clichés are becoming increasingly irrelevant and distasteful to many of the scientists and technologists who now make up such an important and influential section of every advanced society. Such people, by training and temperament, are more likely to be interested in the most practical and rapid ways of getting results than in dogmas and ideologies based on an earlier stage of economic development.

A Problem of Distribution
The question of unemployment worries most people, and it has often been said that if we keep the same working hours and increase productivity, we shall need fewer workers. This is only true if we assume a static demand for goods and services. But the amount of work to be done is limited only by our ambitions. Over-production is not a manufacturing problem. It arises not because people do not want any more goods or services, but because the increased supply cannot easily be distributed to all the people who want and need these things.

As long as our productive capacity runs fairly closely in step with distributed purchasing power, we get little disturbance. Nowadays, through a combination of luck and judgment, we manage to keep the two reasonably in balance. But when the productive machinery becomes so efficient that the problems of distribution assume gigantic proportions, some much more intelligent and perhaps radical solution will have to be found. We cannot possibly tolerate a situation in which people want more goods, with machines capable of producing them in abundance, and in which they are denied their share of these goods, simply because nobody has devised a method of distribution.

The oldest and, in the long run, probably the most effective and simple method is still through wage levels, taxation, and through the use of the price mechanisms. Prices must find their true level. We should stamp on price rings and restrictions on output or on the sharing out of markets. Legislation towards this end has begun but there is a long way to go yet. When perhaps no more than 20 or 30 per cent of the population can provide everything necessary for the 100 per cent., this problem will be vital. But even now in America, in spite of wages at least three to four times as high as British wages, food prices are not very different from ours, because of vast productivity. In terms of real wages, American food is extremely cheap and therefore easy to distribute. As a result, the number of people eating well in America today is much greater than it was fifty years ago, when over 50 per cent, of the population was
working on the land. The same sort of situation will undoubtedly spread over the 
remainder of the world, and into other sectors of production, too, as money and skill 
become available to apply techniques similar to those which are producing such 
remarkable results in America. With automation, the wages of those working could be 
raised, taxation could deal with the necessary social adjustments, and low costs and 
prices would largely solve distribution problems.

More Goods from Fewer Workers
There are economist, knowledgeable in this field, who maintain that, although there 
will be minor problems associated with the introduction of automation on a big scale, 
the rise in productivity and the cheapening of goods following increased efficiency is 
in itself sufficiently powerful to generate its own corrective forces, in the sense that 
new jobs arise as old ones disappear. The American experts who take this view point 
convincingly to the 1964 Manpower Report of the Bureau of Labour Statistics. This 
reveals that between 1957 and 1963 there has been a growth in non-farming 
employment of a little over 4,000,000 persons. This would seem to indicate that 
increase productivity brings increased employment with it and so there is nothing to 
worry about. But there are other factors to bear in mind. For instance, in this same 
period, 1957 to 1963, the direct employment by federal, state, and local governments 
accounted for 45 per cent, of this extra employment, government purchasing for 
almost 20 per cent., and other non-profit making institutions for a further 16 per cent. 
Industry itself accounted for only 5 per cent.

This is a significant figure. Throughout the western world, industry will continue to 
produce more and more goods with fewer and fewer people and possibly with fewer 
and fewer individual companies. It is probable that, in manufacturing industry, 
automation will even accelerate the disappearance of the smaller units. These have 
survived, and even multiplied, by exploiting the inefficiencies displayed by the bigger 
firms as they grow. With full automation, one might expect the industrial giants to 
reduce these internal pockets of inefficiency and so make the small firm a steadily less 
important feature of the industrial life of the nation. In this case, and assuming a free 
economy, it is interesting to wonder what the basis of competition would be between 
two or more fully automated, and therefore presumably fully efficient, concerns. The 
changes will, of course, affect commerce as well as manufacturing. The introduction 
of really effective computers for office purposes is now beginning to make up for the 
shortage of clerical and accountancy labour and later may make some of it even 
redundant. Remember that it takes perhaps two years after an office accountancy 
computer has been delivered before it is really working efficiently, so that staff are 
not immediately affected.

The swing towards employment in the service industries and in the government sector 
is an important factor in cushioning and absorbing the unemployment created by the 
introduction of industrial mechanization and automation. Nevertheless, in my view 
the problem is manageable only if it is accepted that the changes which automation is 
bringing about must be dealt with, at government level, promptly and in a logical and 
sensible Way. In the absence of a national policy on this, attempts at collective 
bargaining in, for example, the printing trade, the steel industry, in motor-car 
manufacture, meat packing, and material handling have only been partly successful in 
dealing with automation problems. Schemes whereby workers share in the profits and
in the saving of costs and receive redundancy or early retirement pay are of considerable help, provided the workers concerned still have the qualifications required for employment elsewhere. But we stand in equal need of satisfactory schemes for those who are no longer employable, either because they lack skill or intelligence, or because age, illness, or personal circumstances make it impossible for them to be physically or mentally mobile.

If technological advance is not to be slowed down, we have to go much further and more quickly in order to deal with the fear of displacement which, naturally, worries the individual worker. This is one of the chief tasks of government anywhere, and in Britain it should not be too difficult. In America, unfortunately, the attitude towards what is traditionally called ‘government interference’ is one of the most serious obstacles to dealing with problems before they get out of hand. One of my fears is that because of possible reluctance of the American Government to act in time, important political tensions could be set up within the American economy. This could have wide implications, because so many of the people displaced by automation will, of necessity, be the unskilled and semi-skilled, among whom the Negroes form a large part. This could be particularly serious at a time when the coloured population of America is increasingly insisting on its rights. These rights must include the right to the kind of education and training to obtain work.

So far, the United States is finding it difficult to cope with this problem—but it has not tried really hard yet. In spite of the great wealth of the American economy, unemployment persists, with a spectacular growth in the size of the labour force within the past twenty years and with thousands of teenagers seeking their first jobs several months after leaving school. The failure to face the extent and scope of the changes that automation can and does bring about is limiting the attempt to find solutions. For instance, an early warning system is being organized to indicate in good time those workers who might be threatened by displacement through technological advance. But this will only work if employers show themselves willing and able to indicate their plans far enough ahead. Publicizing his intentions in this way is asking a great deal of a manufacturer. The result might be that he could lose some of his labour, alarm his shareholders, and encourage his competitors to take steps against him. If legislative action were taken on this one issue alone, much hardship could be avoided and valuable arrangements made for transfer and re-training.

Large numbers of those who become redundant as a result of automation lack skills to fit them for new jobs, and so we find ourselves faced with the paradox that, on the one hand there are numerous empty jobs, and on the other there are numerous people who remain unemployed because there is not enough retraining available. Training should be provided for every young entrant into the labour force. A reasonably good general education is not enough. Imaginatively conceived work-training schemes are vitally important in making people adaptable to change. It has been estimated that to be able to earn a living continuously, the young people now coming into the labour market may need as many as three different kinds of jobs during their lifetime. This requires not merely training in specific skills but considerable mental flexibility, so that workers are prepared and able to learn and re-learn throughout the whole of their lives. We may have to provide in this country up to twelve months’ training for some categories of displaced workers. This will be a costly operation and, whether it is in
the United States or here, it will have to be paid for by the nation if undue hardship is to be avoided, either to industries or to individuals or to local authorities.

In Britain we are still some distance from the point at which we can sensibly and intelligently begin to think as a matter of deliberate policy of reducing the total number of workers engaged in industry. We have such a great shortage of labour at the moment and such a long way to go before we have modernized our national equipment and our industries that, unless miracles occur, we are going to need all the labour we can possibly get for a long time ahead. My fears are not for tomorrow but for the day after. We have to consider this as a problem which may not become acute for some years yet, but it will almost certainly be part of the pattern of the future, and it is not too soon to begin thinking about it now.

Lord Bowden has pointed out recently that, if the projected 4 per cent. growth rate in our economy is to be maintained, a further 1,500,000 skilled workers are going to be needed by 1970. At the same time there will be getting on for 1,500,000 fewer unskilled jobs. Unless something is done about re-training now, these unskilled workers are going to be thrown on the scrap-heap, with no opportunity to share in the wealth resulting from automation.

Fortunately, the changes brought about by automation take time. They do not occur everywhere at once, and so we have enough time to teach a machine-minder that there are newer mechanisms he has to familiarize himself with—electrical, electronic, and pneumatic devices—which have different characteristics and which he has to approach differently. Once he has been taught even this much he will be far more employable. His new work will become far more interesting, because, once he has a better understanding of what is happening and what he is doing, he will be much more than a machine-minder. Training may take as much as twelve months in some cases, because if you want to teach him not merely how to use the new machine but some of the principles of the new techniques to prepare him for further changes, you must be willing to allow a reasonable amount of time for this to be done. Re-education takes a good deal longer than re-training. This is a live problem, particularly in our own development areas, where older industries, which have used a large amount of semi-skilled and unskilled labour, are being replaced by industries needing less and less unskilled operatives and more and more skilled technicians. This is good in itself, but it has its dangers. We might find ourselves establishing only repetitive manufacturing capacity in the depressed areas, leaving the expanding base of technological, scientific, and managerial expertise in the south of England.

The authorities might well insist that any new industrial unit, established with the help of public funds, must be an integrated whole, with the necessary research and development, design and manufacture all carried out on the spot. This is going to be increasingly important as the new universities and colleges of technology begin to turn out graduates. Those located in industrial areas need a fruitful interchange of ideas and personnel between the academic centre and the factory. This will be difficult if only manufacture goes to the development areas, while the management and technological skills remain located elsewhere. Moreover, the integrated business is a much more secure employer than a mere manufacturing unit.
The depressed areas have the advantage of being accustomed to the ways of industry. There is labour and there are houses, roads, communications, which can be modernized without unduly heavy capital investment. The Government should offer strong incentives to establish complete and integrated businesses there and to discourage mere manufacturing offshoots. If this policy were accepted, many London head offices could be usefully reduced in size, and much day-to-day administration could be located at the manufacturing plants. Research and development and design would benefit from the same close connection with the factory. The spread of computerized communications allows the whole of a company’s activities to be integrated without regard to distance. Given governmental help in meeting the costs of such systems, we could see the end of the national waste of the productive and human resources of the depressed areas. It is morally wrong and socially absurd to condemn the north to an existence outside the main stream of industrial change and progress, permanently regarded as old and proletarian, while the south becomes new and middle-class.

How the modernization of this country and of the world is best to be achieved is a big enough problem to produce plenty of disagreement about its solution, and we shall certainly make mistakes. No change so great as this, which will take perhaps fifty years to accomplish, can possibly happen in a completely orderly fashion or without any disturbance or inconvenience. There will inevitably be large areas of conflicting interests, areas of ignorance, areas where adjustments of all sorts will have to be made, and making these adjustments will be very difficult indeed unless there is widespread agreement as to the general aim and its importance.