PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A MATHEMATICAL, PHYSICAL & ENGINEERING SCIENCES

Opening Address

Peter Walker

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Opening address

By The Rt Hon. Peter Walker, M.P.
Secretary of State for Trade and Industry

In a week in which we are threatened with an immediate crisis in coal and an immediate crisis in electrical power and a threatening shortage of oil, I welcome the opportunity to open this two-day meeting that the Royal Society has organized. I want to speak particularly of the practical task confronting the country over the next 20 years. Before doing this I should like to make a few general observations.

In deference to my audience I will first mention some figures which illustrate the magnitudes we are dealing with. Total world consumption of energy in 1961 was estimated to be some 1.2×10^{20} J (4.2×10^9 tonnes of coal equivalent). By 1970 this had grown by 60 % to 1.9×10^{20} J (6.7×10^9 t c.e.). By 1985 exponential projections suggest the figure may be 4.5×10^{20} J (nearly 16×10^9 t c.e.) – $2\frac{1}{2}$ times more in 15 years.

These numbers show the massive scale of what we are considering. But I must now reveal my own view about such projections. Virtually all energy predictions of both demand and supply that have been made in the past have proved to be wrong. I believe in spite of all of our experiences and lessons that have been learnt from inaccurate predictions in the past it is almost equally difficult to predict the total world-wide trends in the future. There are so many uncertainties. On the supply side new energy resources, as yet unknown, can always be discovered. Even 10 years ago few would have predicted the massive resources that we have now discovered in the seas surrounding our coasts. Few can predict accurately the full implications of the development of the fast breeder reactor and the transformation it could bring to the potentialities of nuclear energy. Massive research is taking place throughout the world into new forms of energy and major breakthroughs could be achieved. As to the consumption of energy, the development of the electric motor vehicle could transform the pattern of consumption in one obvious sphere. Substantial savings could be made by far more positive policies towards the elimination of wastage of energy. All this does not of course mean that we should not make forecasts. We must make the best ones we can, recognizing that they may be wrong. Where they suggest a shortage of energy we have to take vigorous action to prove them wrong. One difficulty when making forecasts is to calculate the massive increase in energy consumption that will take place as a result of the new wealth that is currently going to the primary producing countries of the world. The huge increase in commodity prices is going to give a whole range of world economies, from Brazil to Nigeria, from Iran to Venezuela to some of the countries of Africa, the finest opportunity to raise living standards, to raise the speed of policies for their industrialization and therefore to raise enormously their energy consumption.

When a year ago I took on my present responsibilities, I naturally reviewed the then current developments in energy policy. The outstanding point of course was that the British economy as with the economies of the European Community and of Japan had a heavy dependence upon imported oil: a dependence which had been increased in the whole of the post-War period, increased as a result of the fact that throughout the world energy from oil was cheap and abundant. In fact it fitted into the natural objective of governments that their energy policy

should be based upon meeting their energy requirements with reasonable security and lowest total costs over time. But, in the changing scene that I inherited of increasing uncertainty as to both price and supply, it was vital that I pursued a policy to maximize the economic use of all indigenous resources and to do my best to ensure that improved supplies were obtained at the most reasonable price and with the most reasonable security that was available. In this situation therefore a number of major decisions were taken and a practical policy developed.

In the short term, one has to build up defences against temporary interruptions of supply. This meant developing an improved stock position and also having contingency plans which could be applied if there was a necessity to share out a shortage in the least harmful manner. Many months before the present crisis policies were pursued to achieve this objective.

When our oil supplies were threatened with disruption I was able to announce that we had 79 days of stocks with a further 30 days stocks on the way to this country. I might say that those stocks have been an expensive charge upon our balance of payments but, as events have proved, a sensible insurance premium to pay. Likewise, I took powers under the Coal Industry Act to meet the cost of building up substantial stocks of coal. We have built up stocks at power stations of no less than 20×10^6 tonnes – equivalent to 12 weeks supply.

The next facet of our positive approach to energy policy was to examine all of the indigenous resources that were available to us and see that they were developed as swiftly and effectively as possible. I think the nation has underestimated the transformation of energy policy that has taken place over the past 12 months.

There was the decision to reverse previous policies and to stop the rapid rundown of the coal industry. Between 1964 and 1970, 274 pits had been closed, 185000 mining jobs had been lost and coal production had dropped by 50×10^6 t. I decided in November last year that looking at all of the potential sources of energy supply that would be available to Britiain in the 1980s coal would be an important ingredient. I therefore reversed the policy. I introduced the Coal Industry Act which contributed no less than £1100M to achieve this purpose. It meant that jobs would be maintained, that financial help would be given to the selling of coal, that conditions with regard to pensions and redundancy benefits would be improved and that the financial position of the National Coal Board would be transformed.

Since that time I have been engaged in reviewing with the National Coal Board their future investment programmes. Our problem is to develop the viable core, solve the problems of the peripheral fields and continue to make substantial gains in productivity. I must, however, give a warning as to the immediate contributions that the coal industry can make. The fact is that over the next 10 years obviously a number of existing collieries will run out of coal. The building of a new colliery is, alas, a very long-term project. For example, we have discovered a very important seam of coal near Selby in Yorkshire – a seam that could well be the finest seam of coal ever discovered in the United Kingdom. But if all of the current tests prove positive and we make available all of the financial resources that are needed to develop that seam, such are the technical tasks involved that it would in fact be 8–10 years before that new pit was in full production.

Next we have the tremendous potential of oil in the North Sea. It was only a few months ago that I was being criticized for pursuing a policy that would speedily extract the maximum volume of oil from this source. The events of the last two months have seemingly silenced my critics. On all of our calculations of energy problems of the next 20 years it must be right to bring the maximum acceleration to the task of extracting oil from this particular source. There

is of course considerable public misunderstanding as to the timing: a misunderstanding that in days when I have been less engaged with the energy problem I would probably have shared. There is a feeling that the oil has been discovered and so the view to quote a letter from a lady who wrote in recently to the B.B.C. programme '*Any answers*': 'Why do we bother to take oil all the way from the Middle East, why not bring back our tankers from the Middle East and fill them up from the North Sea'. Alas, it is a complicated and expensive task. It is only a few years ago that these resources were discovered. Already £1000M has been invested in the development of these resources and as yet no oil has been landed and there will be very little before 1975.

I would express the hope that with the massive natural interest in this topic and the rather fascinating technical and physical problems involved some enterprising television corporation will soon make an effective film, explaining the difficulties of extracting oil from this Sea. What in fact has perhaps been amazing is the speed of deep-sea petroleum exploration and extraction. Six years ago the deepest water production of the world was around 60 m. North Sea oil will be coming from places where the sea bed is over 120 m deep. There are exciting developments such as semi-submersible drilling platforms which will operate in all but the worst weathers, underwater well completions and reinforced-concrete oil platforms, but with all of these designs there are problems which will need to be overcome in the deeper waters and there is little doubt that the eventual need will be for a completely underwater production system which will raise fresh problems of design and working conditions.

The other sphere of North Sea development, of immense importance is the situation as far as the extraction of gas is concerned. It really is a remarkable achievement of both those that have extracted the gas and of the gas industry in this country that already 90 % of our gas supplies come from the North Sea. It was absolutely right of the Government to pursue the policy of maximizing the resources available to Britain by negotiating with our friends in Norway so that, subject to the ratification of the Norwegian Parliament, we will be able to extract the gas from the part of the Frigg Field that is under their influence. There are possibilities of purchasing gas from elsewhere, but they are less attractive, much more expensive, and some such sources of course have all of the problems of the political stability that we have in terms of oil extraction in other parts of the world.

Both in the oil and gas in the North Sea it must be the policy of the Government to bring these developments to fruition as rapidly as possible. It was for this purpose that we made contact with all of the oil companies. We have endeavoured to find out the difficulties, the problems and the bottlenecks with which they are confronted – for example, steel supplies. We have seen that they have had priority of allocation because of the great national importance of their task. They have had problems of labour relations which we hope will improve, particularly with the recognition of the massive national importance of bringing these schemes to fruition. And certainly it is the intention of my Department to keep in close contact with all of those developing the North Sea, to see that any action that Government can take to assist them in speeding up these developments will in fact be made.

Having dealt with the way in which we have endeavoured to improve the situation in coal, in gas and in oil – I will turn, if I may, to nuclear energy. This is really an indigenous form of energy for all practical purposes, and it will increasingly replace fossil fuels as they become expensive and scarce. And ultimately perhaps a very considerable proportion of the energy of the world will be supplied by this particular means. It was for this reason that in the review of

energy policy that I carried out just a year ago I decided to bring about a very substantial reorganization of the whole of our nuclear industry. I decided it was vital to expand out nuclear power base as quickly as was practical. As a first step it was important to strengthen the nuclear industry by encouraging the creation of one unified design and construction firm. We now have the National Nuclear Corporation. I then wanted to see that the major decisions, such as choice of reactors, were taken on the best possible advice obtainable. It was for this reason that I set up the Nuclear Power Advisory Board with myself as the Chairman of that Board, and contained within that Board the leading authorities and expertise that is available in this country. I have immediately given that Board the task of looking at the immediate problems of nuclear policy, both national and international, and of course we do have an immediate task of choosing a type of reactor. No decision of any description has been taken yet, but the attempt, obviously, is to choose for the interim stages of nuclear development the type of reactor which will best assist us in the longer term. There is no doubt at all in our view, and this is a shared view I think by all concerned, that in the longer term the fast-breeder reactor has the considerable advantage of a better use of uranium and is seen as the predominant type. The prototype development is going to be critical next year and we would expect to be able to place the first commercial order for the fast-breeder reactor in 1976, with a full programme of fast-breeder reactors coming into development and orders being placed throughout the 1980s.

Once again the time-lag is very considerable, and there is no possibility of making decisions today on nuclear policy which will result in any major contribution to our energy supplies within the crucial few years from now until the end of this decade. But in the decade thereafter there is no doubt in my mind that nuclear power will be a very fast-emerging source of energy. International cooperation is important on nuclear development because of the huge costs – the need, for example, to provide fuel for increased nuclear programmes – and governments are seeking this. We have entered into cooperation with Germany and Holland on producing plant for centrifuge-enrichment of uranium. It is vital that we keep in close contact with our colleagues in Europe and colleagues in other parts of the world who are involved in the development of nuclear energy in all of its forms. The new company is doing this and, of course, my own Advisory Board is keeping in close contact with it. And, therefore, in this sphere there are important developments that have taken place in the reorganization. There are very important decisions to be made shortly, and over the next two or three years we are, I think, going to see very considerable progress with our nuclear policy.

Therefore, summing up the energy policy at home, it is very simply to develop as quickly and swiftly as possible the maximum utilization of the indigenous resources that are available to us. Already the major decisions have been taken to do this in coal, gas, oil and in nuclear energy. But there is also, of course, the need, and there will continue to be the need, to import energy from abroad – certainly over the next decade. These imports are vital to us, and it is important to establish the best relationships we can with the producers of these energy supplies. And that is why I am very anxious to see as far as the oil-producing countries of the Middle East are concerned, given the stages of development that some of those countries will now go through in processes of industrialization and in activities diversifying their economies, that Britain plays a very close role with those nations and helps and assists in every possible way. I believe that it is important for the British economy, which has this unique advantage of the considerable resources of the North Sea available to it in the 1980s, to realize that perhaps it has a strong and important negotiating position in studying the long-term economic and commercial interests –

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not just of this country but of the countries that are energy producers at the present time. And I would hope that from this, better commercial and economic relationships could result, and the result of these could be greater security of our oil supplies in this country.

There are, of course, other important developments. The potentialities of the oil shales and the tar sands are enormous. But once again there is a very considerable time-lag involved. Although the increased price of energy has made all of these potentially much more interesting and possible, once you have made the decision that they are to make an important contribution, the time-lag between that decision and actually getting large supplies of energy from those immense resources quite a considerable one and not an immediate solution to our problems.

There is perhaps a more immediate solution and help in better utilization of the energy resources that we enjoy. And here I think it is important that governments and industry should take action during a period of considerable world energy problems to try and reduce the considerable wastage that does take place in our energy resources. Quite a great deal can be achieved in the future by proper insulation of buildings, and governments can act – and I believe will act – in this in terms of the building regulations they produce. But, of course, the immediate impact is on new buildings, whereas most of the energy is used in old buildings. And although one might be able to do further actions as far as old buildings are concerned once again there is a considerable time-scale involved. There is no doubt at all that industry can obtain and agree on a much better industrial use of energy. And certainly by studies that have already been made by a number of individual industries, there is considerable potentiality for reducing present levels of energy usage.

The electric car is a potentiality; although of course still a user of energy, is it of a different nature and different scale, and will give more flexibility to the whole system. Here there are considerable problems primarily concerned with the battery involved. The government has taken an active interest in this and has already provided grants to see what is possible in further research and development of the sodium–sulphur battery.

To sum up, at the moment this country obtains 50 % of its energy from overseas and 50 % is indigenous. We would anticipate from the forecasts that are available that by 1980 we could be providing 75 % of our energy from indigenous sources and that figure can rise thereafter beyond that point, depending upon what in total is found in the resources of the North Sea, and thereafter on a longer scale depending upon the success of our nuclear developments. It does place Britain in a better position as far as energy is concerned than almost all of our major industrial competitors. It does present us with opportunities of developing new industries that will help the world cope with their future energy problems. I believe, for example, the expertise that we will develop in the offshore drilling of the North Sea will give a whole range of British firms an expertise and know-how which will have very considerable world-wide application in the years ahead.

Likewise, I believe the developments of the fast-breeder reactor and developments in the sphere of nuclear energy will have an important world-wide application of benefit to the British economy, and British commerce as a whole. And so although we are faced with immediate considerable problems of energy in the domestic scene, and although we are faced with a considerable dependence upon imported energy for the coming five to ten years, we do have opportunities which are quite unique and do present this country with a considerable advantage. And I believe the main objective of British energy policy is seeing that we exploit and take the fullest advantages of these unique opportunities.

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Discussion

PROFESSOR N. KURTI, F.R.S. (*Clarendon Laboratory, Parks Road, Oxford*)

I was very glad to hear the Secretary of State emphasize the importance of good thermal insulation and say that standards in new buildings will be improved. However, I do not share his pessimism about improving the thermal insulation in *existing* dwellings. Techniques for double glazing, improved insulation for cavity walls, internal claddings for walls already exist, and given reasonable incentives many householders and owners of business and industrial premises would employ these techniques and thereby save the country much fuel.

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