

People and Institutions

The Social System and the Energy Crisis

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The sudden termination of a period of cheap and abundant energy, especially from oil and natural gas, has potential for major structural changes in the economic and social system of the whole world. This is likely to present us with a set of problems which are quite unlike those of the last 25 years, although they are by no means unprecedented in human experience and we may have to go back to earlier periods to find our precedents. The last 25 years have indeed been an age of remarkable stability by comparison even with the 35 years that preceded it, say, from 1914 to 1949, which saw the two world wars and the Great Depression. In the last 25 years there has been no great depression. Wars have been relatively small-scale and local. The British, French, and Dutch colonial empires have been liquidated with remarkably little disturbance. The rich countries and some of the poor countries have exhibited fairly steady rates of economic growth, with the moderately rich countries growing much faster than the very rich ones but the really poor countries not doing so well.

Economic growth is closely associated with rising energy inputs from fossil fuels. Societies with primitive technologies, which rely mainly on immediate solar energy in the form of wood or cow dung for fuel and human or animal muscles for motor power, are of necessity poor. Increasing affluence has come with the kind of knowledge that permits the input of energy from fossil fuels. These inputs, we all recognize, are ultimately limited by eventual exhaustion. They are also very unequally distributed. In the course of time the rich countries are bound to use up their own fossil fuels and will be forced, therefore, to rely increasingly on imports from poor countries

which do not use their fossil fuels themselves but export them. This is a situation which is all too likely to lead to strains in the international system, which so far we seem to have weathered successfully but which may have ominous implications for the future.

Commodity Prices

A question on which far too little research has been done has been the impact of a sharp rise in the price of energy on the whole relative price structure of different commodities. The general answer is clear, that those commodities which require large amounts of energy like aluminum and cement will tend to rise in price relative to other commodities, but how much we do not really know. The shift in the relative price structure is likely to produce considerable changes in technology and the processes of production, particularly moving toward energy-conserving methods of production. This movement is likely to be more pronounced in the case of those commodities which are high energy users, so that the long-run change in the relative price structure may be considerably less than the short-run changes.

The most obvious and dramatic change has been the sharp rise in the price and the decreased availability of gasoline for private automobiles. This situation seems likely to persist for quite a while, perhaps indefinitely, and in the United States will probably survive the lifting of the Arab oil embargo. This is already producing a marked effect on the tourist industry and the automobile industry. The long-run effects, however, are much more difficult to predict because they depend on the response of technology to stress, which has a strong element of uncertainty in it. There will undoubtedly be pressure for energy-conserving forms of

transportation. There is a fair amount of short-run flexibility in this regard in terms of car pools and minor improvements in public transportation. The long-run effects, however, depend both on changes in the technology of supply and to some extent on what might be called the "technology of demand," the adaptation of preferences and lifestyles to changing price and income structures.

I must confess that I think in this regard a good deal more effort will be put into the supply problems than into the demand adjustments. The automobile, especially, is remarkably addictive. I have described it as a suit of armor with 200 horses inside, big enough to make love in. It is not surprising that it is popular. It turns its driver into a knight with the mobility of the aristocrat and perhaps some of his other vices. The pedestrian and the person who rides public transportation are, by comparison, peasants looking up with almost inevitable envy at the knights riding by in their mechanical steeds. Once having tasted the delights of a society in which almost everyone can be a knight, it is hard to go back to being peasants. I suspect, therefore, that there will be very strong technological pressures to preserve the automobile in some form, even if we have to go to nuclear fusion for the ultimate source of power and to liquid hydrogen for the gasoline substitute. The alternative would seem to be a society of contented peasants, each cultivating his own little garden and riding to work on the bus, or even on an electric streetcar. Somehow this outcome seems less plausible than a desperate attempt to find new sources of energy to sustain our knightly mobility.

Income Redistribution

Any change in the relative price structure will create substantial redistributions of income. Those who own resources both of capital or of labor that are specific to the production of those commodities that are rising in relative price will gain at the expense of those whose resources are specific to commodities that are falling in relative price. If, as a result of the successive exhaustion of cheaper materials, we are going to have a long-run rise in the price of fossil fuels and indeed of virtually all raw materials, this is going to result in a redistribution of income away from the users of these things

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toward their owners and perhaps to a lesser extent to their processors and to the labor force that produces them. Most of the benefit, however, will go to the owners in the shape of economic rent, which now seems to begin to raise its horrid head after a period of relative insignificance. The fact that this is likely to lead to some redistribution from the rich countries to the poor countries may perhaps be a source of

ironic satisfaction. On the other hand, the fact that the redistribution will mainly be toward the rich people in the poor countries can produce very little satisfaction at all. The fact that there will be a lot of newly rich and newly powerful people around also hardly makes for world stability. The international monetary system is particularly vulnerable to these new developments, for it depends for its sta-

bility on a certain restraint on the part of those who own or control large amounts of liquid assets.

Nevertheless, one can add a small note of modified cheer. One of the less recognized principles of economics is that, if the price structure is going to change in the future, there is a lot to be said for anticipating this change, simply because this will promote decisions which will prepare for the future. If something is cheap now but is going to be expensive later on, there is a lot to be said for making it expensive now, and this will force technological change in the direction of economizing it. If things are "too cheap," they will not be sufficiently economized. In quieter times the best way to do this is through the tax system, by taxing things that are likely to be scarce in the future, so that it pays to start economizing them now. In regard to oil, the Arabs have now done this for us through their joyful discovery of the pleasures of monopoly. The rest of us, however, should not be too ungrateful to them, even though they are in effect imposing the taxes and enjoying the revenue from them. They may have done us a good turn without quite intending it. They have forced us to think about the rising costs of energy right now, when there is perhaps time to do something about it, whereas without this crisis we might have floated happily on an illusory tide of cheap energy until, say, 1990, when it might be too late to do anything about it.

Future Prospects

It is much to be hoped that we will be stimulated into a massive effort toward the discovery of new sources of economic energy, especially solar energy, which is the ultimate energy source as far as the earth is concerned. It is not that we are bankrupt in energy—it is just that we cannot find the key to the bank, the bank in this case being the solar energy that reaches the earth, of which the whole biosphere uses only a fraction of 1 percent. Solar energy is, of course, diffuse, and the problems of concentration are by no means trivial. Nevertheless, the problem would seem to be difficult rather than insoluble.

I am not suggesting, however, that we put all our effort into producing more energy and none into conserving it. An erg saved is an erg earned, and social invention moving toward less energy-

using but still highly agreeable patterns of human life is still a high priority. On the other hand, we should not delude ourselves with false hopes. There are better ways and worse ways of being poor, and obviously the better ways are to be preferred. A lack of energy input, however, means poverty and it is hard to blame people for not liking it, even when it is the best kind of poverty that can be devised. One is particularly suspicious of good advice from the rich to the poor on how they can make the best use of their poverty.

It is pleasant to speculate whether the energy shortage will produce changes in the family (the New York blackout was followed by an increase in the birthrate 9 months later); in religion, for surely contemplative religion is the least energy-using form of human activity; in politics, for surely a whole new set of symbols will be appropriate to the present crisis; and so on. I must confess I am skeptical of any such projections. If indeed the

automobile is replaced by public transportation, this will turn our cities outside in as the automobile turned them inside out, and we will return to the ecological patterns of the cities of 1880. I am not sure that even this would be a massive social change. The fact is that the energy requirements of all the various activities of a complex society are sufficiently similar so that a rise in the price of energy, although it will produce some structural changes and some income distributions, is likely not only to be offset by countervailing technical changes but may also be very widely diffused. We may all be a little poorer than we would have been if energy had remained cheap, but, if economizing in energy as well as in other inputs continues, we may continue to get richer, at least for a while.

There are, furthermore, other prospects looming on the horizon, such as a food shortage, which may have much more drastic effects than the energy shortage, though they may in part be

consequences of it. Oil indeed may be more important in the future as a source of fertilizer than it is of gasoline, and we are already beginning to see some indications that this may be the most drastic impact of an oil shortage. In the long run materials may be more intractable than energy, although the two are closely related. I confess that I am more worried, looking at the next 30 years, about possible ecological instabilities in developed agriculture, dependent as it is on fuel, fertilizers, monoculture, and constant genetic innovation, than I am about possible curtailments of energy input into private transportation or even manufacturing. The latter does not seem to threaten more than inconvenience. A collapse of developed agriculture, however remote the possibility seems today, threatens major disaster for the human race, with a probability, especially over the next two or three generations, that cannot be put at a comfortable zero.