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SCIENCE

Energy and the Shape of Society

Most people are aware that consumption of energy is involved in many aspects of their lives. Congressmen seem to be convinced that it is important, for at least 33 committees are seeking to have jurisdiction over a piece of the energy action. Even so, the significance of energy in shaping society is probably not generally recognized. Coming shifts in energy sources will have profound effects on the economy and on the way people live. Not all these effects will be manifested quickly, although signs of change are visible. For example, long-depressed Appalachia is beginning to enjoy a revival of demand for its resources. In contrast, the prognosis for New England during the next decade is relatively bleak; the area has come to depend very heavily on cheap foreign oil. Low prices for petroleum will not return, and the region must send huge sums of money elsewhere to pay for its energy while facing serious unemployment. Some notion of the magnitude of the coming evolution may be guessed at by a brief survey of some earlier experiences.

Before about 100 years ago this nation's principal source of energy was wood, with some contribution from windmills and waterpower. Most people lived on farms. Then came a great industrial development fueled by coal. As a result the center of industrial activity of the country shifted toward Pittsburgh and the Middle West. Soon the electric streetcar came into wide use in mass transport, and this had considerable influence in determining the evolution of the shape of cities. About the time of World War I, use of oil began to have significant impact on the economy and on living patterns. Cheap and abundant gasoline made possible a mobile society and ultimate shifts in the location of housing developments. Machinery powered by oil products led to a profound revolution in agriculture and a great outflow of people from rural areas.

In about 1950 natural gas came to have an important role in the economy. Because of its low cost and superior quality as a fuel, it determined the location of vast new petrochemical complexes. Texas and other Gulf states enjoyed great prosperity and booming construction. Areas dependent on coal did not fare well; oil and gas were priced so low as to depress the price and inhibit the use of coal. Appalachia experienced 20 years of stagnation.

Today Appalachia can look toward a different future. Coal is now in demand at prices that are bringing in much money. Moreover, in future additional large chemical complexes devoted to liquefaction and gasification of coal will be constructed. This will upgrade employment opportunities by increasing the need for chemical engineers and trained technicians and operators.

Other regions will also be affected by the changing energy picture. Energy costs have become an important factor in many industrial processes and will accordingly be significant in determining which regions prosper and which decay. It is too early to forecast the decline of a state, such as Louisiana, but the prognosis for the Gulf states has changed. Not so long ago natural gas could be obtained at a cost of less than $0.10 per million Btu. Some long-term contracts are still honored at prices in the vicinity of $0.25. However, gas from new discoveries is selling in the intrastate market for about $1.75 per million Btu. In contrast, coal in Appalachia and in parts of the Middle West can be bought as low as $0.50 per million Btu. In some of the Rocky Mountain states, this figure is about $0.25. The corresponding price of energy from imported oil is about $2.

It is too early to sketch further the detailed outlines of coming social and economic adjustments. However, it seems evident that the coastal areas of this country are entering an era in which they will be handicapped relative to some interior states. What happens will, of course, depend on many factors, including attitudes of the states toward industrialization and availability of other vital materials, such as water. It will also depend on the extent to which nuclear energy is employed. In any event, we have passed a great bend in the road and are moving toward changes comparable to some of those that occurred in the United States earlier in the twentieth century.—PHILIP H. ABELSON