ADVANCED READING

PASSAGE 1

Extended debate concerning the exact point of origin of individual folktales told by Afro-American slaves has unfortunately taken precedence over analysis of the tales' meaning and function. Cultural continuities with Africa were not dependent on importation and perpetuation of specific folktales in their pristine form. It is in the place that tales occupied in the lives of the slaves and in the meaning, slaves derived from them that the clearest resemblances to African tradition can be found. Afro-American slaves did not borrow tales indiscriminately from the Whites among whom they lived. Black people were most influenced by those Euro-American tales whose functional meaning and aesthetic appeal had the greatest similarity to the tales with deep roots in their ancestral homeland. Regardless of where slave tales came from, the essential point is that, with respect to language, delivery, details of characterization, and plot, slaves quickly made them their own.

PASSAGE 2

Four legal approaches may be followed in attempting to channel technological development in socially useful direction: specific directives, market incentive modifications, criminal prohibitions, and changes in decision-making structures. Specific directives involve the government's identifying one or more factors controlling research, development, or implementation of a given technology. Directives affecting such factors may vary from administrative regulation of private activity to government ownership of a technological operation. Market incentive modifications are deliberate alterations of the market within which private decisions regarding the development and implementation of technology are made. Such modifications may consist of imposing taxes to cover the costs to society of a given technology, granting subsidies to pay for social benefits of a technology, creating the right to sue to prevent certain technological development, or easing procedural rules to enable the recovery of damages to compensate for harm caused by destructive technological activity. Criminal prohibitions may modify technological activity in areas impinging on fundamental social values, or they may modify human behavior likely to result from technological applications—for example, the deactivation of automotive pollution control devices in order to improve vehicle performance. Alteration of decision-making structures includes all possible modifications in the authority, constitution, or responsibility of private and public entities deciding questions of technological development and implementation. Such alterations include the addition of public-interest members to corporate boards, the imposition by statute of duties on governmental decision-makers, and the extension of warranties in response to consumer action.

Effective use of these methods to control technology depends on whether or not the goal of regulation is the optimal allocation of resources. When the object is optimal resource allocation, that combination of legal methods should be used that most nearly yields the allocation that would exist if there were no external costs resulting from allocating resources through market activity. There are external costs when the price set by buyers and sellers of goods fails to include some costs, to anyone, that result from the production and use of the goods. Such costs are internalized when buyers pay them.

Air pollution from motor vehicles imposes external costs on all those exposed to it, in the form of soiling, materials damage, and disease: these externalities result from failure to place a price on air, thus making it a free good, common to all. Such externalities lead to nonoptimal resource allocation, because the private net product and the social net product of market activity are not often identical. If all externalities were internalized, transactions would occur until bargaining could no longer improve the situation, thus giving an optimal allocation of resources at a given time.

PASSAGE 3

The energy contained in rock within the earth's crust represents a nearly unlimited energy source, but until recently commercial retrieval has been limited to underground hot water and/or steam recovery systems. These systems have been developed in areas of recent volcanic activity, where high rates of heat flow cause visible eruption of water in the form of geysers and hot springs. In other areas, however, hot rock also exists near the surface but there is insufficient water present to produce eruptive phenomena. Thus a potential hot dry rock (HDR) reservoir exists whenever the amount of spontaneously produced geothermal fluid has been judged inadequate for existing commercial systems.

As a result of recent energy crisis, new concepts for creating HDR recovery systems—which involve drilling holes and connecting them to artificial reservoirs placed deep within the crust—are being developed. In all attempts to retrieve energy from HDR's, artificial stimulation will be required to create either sufficient permeability or bounded flow paths to facilitate the removal of heat by circulation of a fluid over the surface of the rock.

The HDR resource base is generally defined to included crustal rock that is hotter than 150℃, is at depths less than ten kilometers, and can be drilled with presently available equipment. Although wells deeper than ten kilometers are technically feasible, prevailing economic factors will obviously determine the commercial feasibility of wells at such depths. Rock temperatures as low as 100℃ may be useful for space heating; however, for producing electricity, temperatures greater than 200℃ are desirable.

The geothermal gradient, which specifically determines the depth of drilling required to reach a desired temperature, is a major factor in the recoverability of geothermal resources. Temperature gradient maps generated from oil and gas well temperature-depth records kept by the American Association of Petroleum Geologists suggest that tappable high-temperature gradients are distributed all across the United States. (There are many areas, however, for which no temperature gradient records exist.)

Indications are that the HDR resource base is very large. If an average geothermal temperature gradient of 22℃ per kilometer of depth is used, a staggering 13,000,000 quadrillion B.T.U.'s of total energy are calculated to be contained in crustal rock to a ten-kilometer depth in the United States. If we conservatively estimate that only about 0.2 percent is recoverable, we find a total of all the coal remaining in the United States. The remaining problem is to balance the economics of deeper, hotter, more costly wells and shallower, cooler, less expensive wells against the value of the final product, electricity and/or heat.