Book Reviews

Calls for Transformation

The Radicalisation of Science. Ideology of/in the Natural Sciences. HILARY ROSE and STEVEN ROSE, Eds. Holmes and Meier, New York, 1977. xxvi, 206 pp. $23. Critical Social Studies.

The Political Economy of Science. Ideology of/in the Natural Sciences. HILARY ROSE and STEVEN ROSE, Eds. Holmes and Meier, New York, 1977. xxvi, 218 pp. $23. Critical Social Studies.

"Physicists have known sin," Oppenheimer remarked in a moment of contrition, after giving his all to start the nuclear arms race. "Knowledge of physics contains no sin," retorted Lawrence, quite unashamed of *his* contribution to the race. Of course, we can evade the confrontation by saying that they were talking past each other. Oppenheimer was commenting on the uses to which physicists put their knowledge, Lawrence on the pure thing-in-itself, knowledge of the physical universe. But that reassuring separation, which seems to absolve scientists of the horrible uses to which they and their science are often put, is too easy. The hard question is whether in the real world science is separable from scientists and both from the uses to which they are put. Is it not the case that all are inextricably entangled with each other, caught up in an overwhelming historical process that mocks anyone's claim to independence of deed or purity of purpose?

The "radical science movement" deserves credit for insisting that scientists confront that painfully difficult problem. Unfortunately, if this two-volume anthology is truly representative, the movement is more likely to provoke ridicule than radical thought. A few admiring references to urban guerillas and airplane hijackers are not the main absurdity. Most of the authors are far more contemplative than militant. A clear battle cry here and there—"The enemy is the American Association for the Advancement of Science" (*Radicalisation*, p. 133)—is drowned in the murmur of preliminary theorizing, preparing for a future assault on science itself, to transform it, to make it science "for the people."

The main trouble is that much of the contemplative murmur is not particularly radical, or even meaningful. Chairman Mao can sound like the message in a fortune cookie: "If you want to know the taste of a pear, you must change the pear by eating it yourself" (*Political Economy*, p. 3). Castro can sound like the Pope: "We shall never be too numerous, however many of us there are" (*ibid.*, p. 174). Admirers of Marxism can sound like worshipers of Holy Scripture: "There is nothing in Marx, Lenin or Mao [whatever happened to Stalin?] that is or that can be in contradiction with the particular physical facts and processes of a particular set of phenomena in the objective world" (*Radicalisation*, p. 59). And a feminist attack on male-dominated science can sound like a mad caricature of Freud: "Fetishism, production, science, are all linked according to a phallic code—'The no-penis is no-knowledge' " (*ibid.*, p. 87).

The editors call this "a cheerful and energetic eclecticism." Dreary mishmash would be a more accurate description. Most of the essays are maundering in style, and all are depressing when they make sense, for they all accept a grim view of modern science. It has become less and less a philosophic inquiry, more and more an integral part of the military-industrial complexes in various nation-states. All of them together seem programmed to destroy humanity, either swiftly in total war or slowly in ecological strangulation. In this familiar dirge the authors intersperse choruses of radical reassurance, but they fail to reassure. On the contrary, they provoke the depressing thought that our world is already devastated, in spirit. The transcendent visions that once inspired grand hope—Marxism in the present case—seem drained of vitality. The authors keep chanting that China is showing the way to renewed hope, but they are as vague as the messengers of heaven in the older churches. Obviously the faithful dare not look too closely at the Chinese replacement for the Soviet paradise lost.

The one contributor who really knows China, Joseph Needham, is also unique in his line of argument. He concedes that pure science lends itself to terrible purposes by its ceaseless effort to eliminate subjective elements from knowledge, its ruthless tendency to separate knowledge from values and to equate knowledge with power. But that, he argues, is the nature of the beast, in China as elsewhere. It needs to be tamed—not transformed, as his colleagues insist—by other modes of apprehending reality, religion included. "The Western world should learn from the Chinese the infinite value of feminine yieldingness, . . . the perfect balance of the Yin and Yang, the female and male forces in the universe" (*Radicalisation*, p. 117). We might try to reconcile that antique chinoiserie with Maoism, but only at the risk of blaspheming both. We might, for example, recall Mao's celebrated belief that the Chinese people are "poor and blank," like paper, on which one may write whatever one likes. But we can hardly work out the metaphor in terms of Mao's masculine Yang pressing upon the yielding Yin of the poor and blank Chinese people. Maoists and Confucians would both be scandalized.

In any case, Needham's divergence from his comrades on the nature of the Chinese solution is less important than his divergence on the nature of the universal problem to be solved. Not science itself but its misuse is the problem for Needham, as for the usual liberal scientist. The notion that science must be changed, if its misuse is to be prevented, belongs, says Needham, to "the counter-culture," which favors romantic, mystical, or occult beliefs. But his fellow radicals in these volumes are not mystics, with the possible exception of the feminist who denounces science as a form of phallic worship. In fact they never ask whether science is merely one mode of apprehending reality. They seem to take it for granted that science is the only mode. That may be a major reason why they assume that it must be transformed. Their ideology—Needham calls it scientism—recognizes no other way than science to discover and serve worthy purposes, yet present science is deliberately indifferent to human purposes.

With the philosophical issues overlooked and specific issues slurred over, most of the insistence on transforming science becomes empty sloganeering. Hilary and Steven Rose make the only efforts to be concrete. They attack "biologism" in psychiatry and in educational psychology. For a while the enemy seems to be any sort of psychosurgery or chemical therapy, but all of a sudden we are told that psychiatrists may use chemical therapy, if they follow the "dialectical" rule discovered by Oliver Sacks:

adjust the drug prescription to the psychological individuality of the patient (*Political Economy*, p. 102). Unfortunately an equally profound rule for neurosurgeons seems as yet undiscovered. The Roses do not tell us how to distinguish between psychosurgical "biologism" and acceptable types of neurosurgery. Is it all right to excise brain tumors? The Roses do not say.

Steven Rose's exposé of the "IQ racket" is almost entirely devoted to hereditarian figures and issues of a bygone age, and to such vestiges as Jensen and Shockley. We can only guess what Rose may think about the live issues in educational psychology. He seems to be against any effort to establish standardized, objective tests as a method of discovering which children need what kinds of education. Yet he also rejects, en passant, "the self-fulfilling prophecies of teacher labelling of children" (*Political Economy*, p. 140). He seems unaware of the implicit dilemma. If intuitive assessment and standardized testing are both no good, how is universal compulsory education to work? Perhaps the answer is that it can't work and should be scrapped, but Rose is silent on that radical proposal. He is too intent on pasting a label, "biologism," on the would-be science of educational psychology, which is in fact overwhelmingly indifferent to the problem of biological determinants of human behavior.

Three excellent essays (by Gorz, Lévy-Leblond, and Enzensburger) imply that modern science and society are so organized as to be jointly incapable of dealing in a humanly satisfying way with large social problems, such as education. Gorz is especially forceful:

> The expansion of knowledge . . . has gone in parallel with a diminution of the power and autonomy of communities and individuals. In this respect, we may speak of the schizophrenic character of our culture: the more we learn, the more we become helpless, estranged, from ourselves and from the surrounding world. This knowledge we are fed is so broken up as to keep us in check and under control rather than to enable us to exercise control. Society controls us by the knowledge it teaches us, since it does not teach us what we need to know to control and shape society [*Political Economy*, p. 64].

Lévy-Leblond argues that within science itself the process of discovery is increasingly "diffuse"—it is harder and harder to know exactly who made the important discoveries—and nominal rewards are therefore increasingly arbitrary. As a result scientific creativity declines, and "visible signs of sclerosis and deterioration" appear. "The theoretical content of this science [physics] is devalued or forgotten to the benefit of a purely technical conception" (*Radicalisation*, pp. 156, 164).

The most notorious case of modern social organization causing "sclerosis and deterioration" in science is of course the thirty-years' war of Lysenkoism against biology—in the Soviet Union, not in a capitalist country. That is an awkward anomaly for the radical science movement, and Lewontin and Levins summon their comrades to an explanation, lest they lose faith in "cultural revolution," which is good and healthy in China though it proved "abortive" in Russia. In Medvedev's book (*1*) and in mine (*2*), they have seen the argument that Lysenkoism was a product of collectivization and the protracted crisis that ensued in agriculture. Lysenko carried Stalinist willfulness from "the great social experiment" into agronomic and biological experimentation. In all these enterprises normal reasoning from average results was rejected in favor of authoritarian insistence that the unfortunate majority (of farms or experiment stations or laboratories) must follow the example of the happy exceptions—until massive, protracted failure forced a grudging retreat.

In principle Lewontin and Levins like that method of experimentation—it is Maoist as well as Stalinist—which gives them the problem of explaining the poor results and the retreats, or explaining them away. They blame the northern climate—of Russia proper, to be precise, not the supplementary breadbasket discovered in Canada. They blame the Russian peasantry for petty-bourgeois "sabotage" of the agrarian revolution, yet praise that class for its role in the cultural revolution: it produced "peasant scientists" like Lysenko. They blame the geneticists, whose "class origin" was subversively nonpeasant, by and large, and whose science was so full of such terrible faults that poor Lysenko could see only the errors and missed the truths (*3*). As for Marxist-Leninist ideology, it cannot possibly be blamed, for it is divinely perfect: "There is nothing in Marx, Lenin or Mao [or Stalin?] that is or that can be in contradiction with the particular physical facts and processes of a particular set of phenomena in the objective world" (*Radicalisation*, p. 59).

It would be unfair to compare this to Arthur Koestler blaming Galileo for the Inquisition's ban on the earth's motion (*4*). Koestler's argument was not nearly as ridiculous, and the Inquisition was not nearly as brutal as Stalin's regime. It is a puzzle why self-styled radicals humiliate their minds and damage their cause by worship of tyrannous regimes in distant lands. Perhaps Enzensburger, one of the intelligent contributors to the present anthologies, has solved the puzzle. Criticism of one's own society is a pain in the critic's mind, especially if it can find no outlet in effective action to change society. In such circumstances radical criticism tends to shift from "the methodical investigation of reality . . . [into] a defence against that very reality, . . . a collection of exorcisms. . . . Reference to the need for revolution becomes an empty formula, the ideological husk of passivity" (*Political Economy*, p. 180). Conservatives will be foolish to find smug satisfaction in that degeneration of the left. It may be another sign that our problems are becoming insoluble.

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References and Notes

1. Zh. A. Medvedev, *The Rise and Fall of T. D. Lysenko* (Columbia Univ. Press, New York, 1969).
2. D. Joravsky, *The Lysenko Affair* (Harvard Univ. Press, Cambridge, Mass., 1970).
3. In fact Lysenko's attack on genetics was provoked by the most elementary truths in that science, not by its imperfections in advanced theory. See Joravsky (*2*), p. 207 and passim.
4. See A. Koestler, *The Sleepwalkers: A History of Man's Changing Vision of the Universe* (Macmillan, New York, 1959), part 5.

Molecular Biology

RNA Polymerase. R. LOSICK and M. CHAMBERLIN, Eds. Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y., 1976. x, 900 pp., illus. $38. Cold Spring Harbor Monograph Series.

The enzyme RNA polymerase, which is responsible for the transcription of genetic information from DNA to RNA, plays a central role in the control and expression of genetic information. Our current understanding of this complex enzyme is reviewed and discussed in this book. The book is divided into two sections: the first consists of articles reviewing particular subjects and the second is a series of research papers.

The scope of the book is wide, including topics such as protein chemistry, DNA recognition sequences, the function of a variety of bacterial and phage-induced transcription factors, and their mechanisms of action at the stages of initiation, elongation, and termination of RNA synthesis. Inevitably, the emphasis is on bacterial enzymes, which have been the most intensively studied. In addition, there are articles on more recently discovered RNA polymerases, in-