Book Reviews

Can Man Be Modified? Jean Rostand. Translated from the French by Jonathan Griffin. Basic Books, New York, 1959. 105 pp. $3.

"Have not the biologists the right to a little conceit, when they add up what they have achieved in the space of a mere half century?" asks Rostand, as he proceeds to catalog many of these achievements and predict future ones: parthenogenesis, sex control, chemical control of personality, artificial insemination, preservation of choice human sperm for long periods of time, modification of brain function, and so forth. The picture is familiar: it is *Brave New World* again.

It has been more than a quarter of a century since Aldous Huxley made his synthesis of implications. The evidence of his success is the extent to which subsequent writers in the same field have found it impossible to go beyond what he said. They may praise him or damn him, but they cannot, apparently, be very original. Some plagiarize *Brave New World* unconsciously, supposing they are saying something new. Others, more perceptive, generously acknowledge their debt, as Rostand does. A critic might protest against the repetition of ideas, but this reaction is probably wrong. Truth in human affairs has a sort of "half-life"—of ten years, say?—and it is necessary to revive truth periodically, to recharge its source, so to speak. The generations of mankind succeed one another rapidly, and the continuance of society requires endless repetitions, however painful they may be to the critic of long memory. He will just have to suffer.

Rostand is intransigently optimistic about the changes made possible by science and technology. Why, he asks, should we fear such developments as those that give us more leisure? "This is really like being afraid that a wife may become too beautiful, and I agree with Raymond Queneau . . . that 'the people who whine about naughty robots and inhuman machinery have never proved anything except their own lack of imagination and fear of liberty.'" With respect to the biological frontier, Rostand is delighted to report: "The fertilising needle enters into morals, it is provided for and paid for under social insurance, and already one receives pieces of pasteboard with such inscriptions as: 'Mlle X has the pleasure of announcing the birth of her daughter [or son] by artificial insemination.'" This appears to be a statement of French fact rather than a prediction. It came as a surprise to me; I have not yet received any such formal announcement (but would be most delighted to see one).

Can Man Be Modified is a gracefully written book, with a bit of the *épatez les bourgeois* spirit in it that the French, from long experience, can manage so well. Yet it is basically serious, as Rostand insists, near the end: "We who are called 'scientists'—and it is a name we do not refuse, for there are less honourable ones—are not as grossly and naively insensitive as people are apt to believe. The fact that we persist in regarding man as part of nature does not make us have less respect for him or incline us to treat him without ceremony. I will even go so far as to say that perhaps respect for mankind should be even greater in those who believe only in man, —in those who, stripped of every illusion about transcendence, can only see in man an animal unlike any other, with no obligation except towards itself, with no law to obey except its own and with no values to revere except those of its own making."

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Theory of Relativity. W. Pauli. Translated from the German by Gerald Field. With supplementary notes by the author. Pergamon, New York, 1958. xiv + 241 pp. $6.

This book presents a comprehensive and critical discussion of both the special and the general theory of relativity. The discussion first appeared in 1921, in German, as an extensive contribution to volume 5 of *Encyklopädie der Mathematischen Wissenschaften*. Because of its excellence, and in view of the great interest in the relativity theory at that time, Sommerfeld arranged for its immediate publication in separate book form. Now, thanks to Gerald Field's translation and to Pergamon Press, we are privileged to welcome Pauli's article, extended by him with extensive notes on developments between 1921 and 1956, into the English literature.

The many virtues of Pauli's discussion were eloquently proclaimed by the creator of the relativity theory, Albert Einstein, writing (in German) in *Naturwissenschaften* [**10**, 184 (1922)]: "It would be difficult for anyone who studies this mature and beautifully constructed work to believe that the author is a man of 21 years. One doesn't know what to admire most, the psychological appreciation for the development of ideas, the sureness of the mathematical deduction, the deep physical insight, the faculty for a clearly arranged systematic presentation, the knowledge of the literature, the factual completeness, or the sureness of criticism."

Part 1 (20 pages) contains a critical and thorough analysis of the empirical basis, and of important tests, of the special theory.

Part 2 (50 pages) is devoted to a complete and general discussion of the mathematical tools of the special and the general theory. Variational theorems, the theory of invariants, parallel displacement, and covariant differentiation in affinely connected, as well as Riemannian, spaces are a few of the topics covered. This part is of especial value to the serious student of the general theory.

Part 3 (71 pages) presents an exhaustive exposition of formal developments, including action principles, and of physical applications of the special theory to mechanics, electrodynamics, and thermodynamics.

Part 4 (42 pages) is concerned with the general theory. It presents a full discussion of the basic ideas of the equivalence principle and of general covariance and considers applications of the theory to special problems. In this part one first realizes how long ago this book was written. It is only in the supplementary notes that one finds a discussion of Friedmann's solution (1922) to the field equations for a world with a time-dependent metric and of the significance of this work for the cosmological problem, following the discovery of the red shift by Hubble. Also, the extensive work of Einstein, Infeld, and their collaborators in obtaining the law of motion of a particle from the field equations, with no additional assumptions, is only briefly referred to and discussed.

Part 5 (22 pages) is devoted to attempts to formulate an electromagnetic theory of mass within the framework of the special theory and to Weyl's attempt to incorporate electromagnetism in the world geometry, along with gravitation. Other, more recent, attempts to arrive at a unified field theory, by Einstein and by Kaluza and Klein, are discussed and