Book Reviews

Evolution, Marxian Biology, and the Social Scene. Conway Zirkle. University of Pennsylvania Press, Philadelphia, 1959. 527 pp. $7.50.

On 14 December 1958 *Pravda* denounced the author (Conway Zirkle) and the reviewer (Theodosius Dobzhansky) of this book as "reactionaries," because of their opposition to Lysenko's perversion of science. However, the two "fellow-reactionaries" find themselves at odds about several matters that are discussed in this book. The purpose of the book is to document the author's belief that ". . . a Marxian biology exists as a destructive, threatening, and well-organized cult. . . . Once we have traced its historical development we can show how it has modified the growth and development of our own beliefs and how it has pervaded our own thinking. Today, it is imbedded not only in the writings of socialist theoreticians and left-wing philosophers but in fields and disciplines that, ostensibly, are not marxian at all. It has contributed to our present ideologies much more than appears on the surface." The author is on the track of Marxian biology throughout the 12 chapters of his book. About half of the chapters present concisely the history and the modern state of genetic and evolutionary theories, and the other half are concerned mainly with the social and political implications of these theories. (These latter chapters are: "The beginnings of Marxian biology"; "The impact of evolution on society and on the social studies"; "Marxian biology and beautiful letters"; "Marxian biology in the communist world"; "Marxian biology and sociology"; and "Epilogue"). Yet, I find myself unsure about just what constitutes Marxian biology. On pages 85 and 112 it is stated that Marx and Engels (i) accepted organic evolution, (ii) accepted natural selection in place of teleology, (iii) rejected the Malthusian principle as the selecting agent, (iv) were disrespectful to Malthus as a person, (v) believed in the inheritance of acquired characters, and (vi) stressed the role of the environment as a cause of the variability of the human species. At present, "The attitude assumed by the Marxians toward eugenics is one of the best identifications we have of their peculiar biology, in both its overt and privy forms" (page 142). I question the diagnostic value of these identifications. Darwin, who was not a Marxian biologist, accepted points 1, 2, and 5, and was not very sure about 6. Because he published in 1946 an excellent history of the idea of the inheritance of acquired characters, nobody is better qualified than Zirkle to know that, before the advent of modern genetics, inheritance of acquired characters was an admissible working hypothesis, and that at present the belief in such inheritance is an identification not so much of Marxism as of simple ignorance of elementary biology.

As to skepticism concerning eugenics, is this really diagnostic of Marxism, even "when combined with the other symptoms of the Marxian syndrome"? The author admits (page 166 and elsewhere) that the excesses of social Darwinism and of some brands of "race-and-class" eugenics have produced a perhaps not wholly illegitimate recoil reaction among both biologists and sociologists, and that this revulsion has harmed also the scientific study of the role of the biological factors in human affairs. The more diffuse the characteristics of a syndrome, obviously the more pervasive will its elements be found to be, and this will result in some perplexing situations. The author himself notes with embarrassment (page 304) that "To include Alfred Lord Tennyson among the writers who helped to spread Marxian biology might seem to be the height of something or other." Other "heights" are the inclusions among the "helpers" of such diverse figures as Samuel Butler, G. B. Shaw, Alphonse Daudet, Jack London, E. Bellamy, Lester Ward, H. G. Wells, P. Kropotkin, O. Hertwig, and even Rudyard Kipling! I am proud to qualify for membership (probably of a privy kind) in so distinguished a company (page 493). The penetration of Marxism in our culture would seem to be wide indeed, as the author claims. But I respectfully suggest that, in the West, Marxian biologists are not hidden under every laboratory bench; that they are a rare species; and that the Lysenko scandal has reduced their ranks to near-extinction.

The situation in the Soviet Union is, of course, a different story. When, in the fullness of time, the amount of harm done by the Michurinist-Lysenkoist incompetents to Russian cultural and economic life will be estimated, a sizable fraction will probably be found in that they caused a whole generation to be miseducated on prescientific superstition masquerading as biology. This sad tale has been told many times, and a concise summary is included in the book under review. A puzzle which remains unsolved is why the rulers of U.S.S.R. have committed a blunder so egregious. It may be that a blunder is a blunder, and irrational behavior cannot be justified rationally. The author has a quite different view, which is perhaps the ideological axis of his book. He believes that "Environmentalism is so important to the communists that they would preserve it at all costs, even if it meant the suppression of scientific discoveries and the destruction of research institutions." I dissent. Marxism is just as compatible with the *fin de siècle* brand of Lamarckian environmentalism as it is with modern scientific biology. True, Marx, Engels, Lenin, Timiriazev, and other divinities of the communist pantheon believed in the former. But is this not what one expects those familiar with only the *fin de siècle* biology to believe in? On the other hand, there were a few geneticists in the West, and among them even very good ones, who were also communists. They looked very foolish indeed when trying to invent excuses for Lysenko's debaucheries, but there is no evidence that they found it difficult to square their political views with scientific biology. The author does not know, or at least does not mention in his book, that in the twenties it was apparently a touch-and-go proposition whether genetics or hotchpotch Lamarckism would be declared to be the Party Line. And why not? The author himself points out that Lamarckism may lead to some conclusions outrageous to a thinking Marxist (page 333 and elsewhere). The historical antecedents of the destruction of genetics in Russia are yet to be fully clarified.

I consider it a serious error to claim that the sets of political beliefs known as Marxist, Leftist, and even liberal, are compatible with some "Marxian biology" and not with modern biology, genetics, or evolution theory. This comes dangerously close to a contention that a different set of political views follows from modern biology. Lysenko and his adherents declared genetics to be a bourgeois, reactionary, idealistic (and so forth) science; is the non-Marxian biol-

ogy a Tory biology, or an Old-Guard-Republican biology? I do not believe this to be the case; but those who might wish to contend that it is will find in the book under review enough material to support these contentions.

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Between Earth and Space. Clyde Orr, Jr. Macmillan, New York, 1959. ix + 253 pp. Illus. $4.95.

This book is a fine contribution to the lengthening shelf of popular science volumes. It deals with the thin atmospheric envelope around the earth. The origin, physics, and chemistry, of our air mantle are well presented by the author, who wields a very facile pen. With a sense of the dramatic he introduces the reader to the realm of unending storms, large and small. The beautiful aspects of clouds, auroras, and the many halo phenomena are deftly sketched and the causes are well explained.

As a chemical engineer, Orr is particularly at home in matters dealing with air suspensions and atmospheric pollution. The past and present state of affairs and the anticipated future problems in the struggle for clean air concern people in all walks of life. Here is a thought-provoking summary of the issue we face in this field.

It is a pity that such a well-written book is marred by a number of small slips. Some of them are probably attributable to the author's acceptance of news stories as sources. Among these slips are erroneous reports of a wind of 392 miles per hour and of a tornado with translatory speed of 130 miles per hour, and confusion of the maximum wind speed recorded at Mount Washington, in 1934, with wind speed during the New England hurricane of 1938. One must also raise an eyebrow at the reference to thunderstorms "over land" at the North Pole, and at the labeling of the upwelling cold water along the West Coast as "an Arctic current." The professional meteorologist will also find, here and there, too ready an acceptance of solar influences which still have to be proved.

These inaccuracies do not greatly detract from the general merits of the book. Most of them could be readily remedied in a second printing. They are well compensated for by the technically acceptable discussions on climate, on the behavior of the weather, on the difficulties of forecasting, and on the possibilities of modifying the weather. The section on upper atmospheric exploration by rockets and satellites is as up-to-date as one can hope for during a period of explosive development. Eight good plates accompany the text, but a few more illustrations might have helped the reader to visualize better many of the phenomena.

The book has a good index and a useful reading list of titles of over 200 books and articles. Many of these publications provided raw material for the author. I am sure that most of the original writers of the popular or semipopular material cited would feel gratified at the effective use which has been made of their contributions. Anyone who wants a quick and easy glimpse at developments in atmospheric science can get it from this book. It is also well suited for high-school science libraries.

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Nomograms for Chemical Engineers. Om P. Kharbanda. Academic Press, New York, 1958. xi + 247 pp. Illus. $15.

The book consists of a compilation from the literature of over 100 nomograms, including many devised by the author. Nomograms of particular interest to the chemist and chemical engineer for the determination of physical properties and the solution of problems on unit operations are presented. Each nomogram is accompanied by descriptive material, including the theoretical and empirical basis of the nomogram, literature references, and an illustrative example.

The format of the book is particularly convenient; a full 8½- by 11-inch page is devoted to each nomogram in most cases. The main drawback of such a compilation is the necessarily restricted selection of nomograms; also, the data available for the construction of each nomogram are often incomplete; for example, only selected substances are included among the physical properties.

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Photomicrography. Roy M. Allen. Van Nostrand, New York, ed. 2, 1958. xiii × 441 pp. Illus. $9.

Relatively few changes have been made for this new edition. The basic methods of an expert in black-and-white photography are again presented. New pictures illustrate the chapter on modern photographic equipment, and the comments are the equivalent of a personal shopping tour with the author. For many readers this chapter will justify publication of the book. A new chapter gives a rambling account of phase microscopy and mention of interference microscopy, the latter section being interrupted for an account of a variable-phase microscope. In neither section are the problems of photography considered. The chapter on the electron microscope (five pages in the first edition) now occupies 12 pages.

The chapters on fundamental principles, homemade equipment, photographic processes and equipment, and microphotography remain about the same, except for the addition of some illustrations and descriptions of some new equipment. The chapter on microphotography is so meager and out of date that it might well have been omitted. In the chapter on techniques and processes some information on modern equipment and methods has been included, but there should have been more pruning of material on obsolete, discontinued equipment. None of the stronger sources for fluorescence microscopy are mentioned, and statements such as "only low powers can be used, as otherwise exposure times may extend into many hours" should have been dropped in this edition. In discussing stereoscopic photomicrography the author makes no mention of the use of twin-lens cameras, although the method has been used in several places for several years.

The most serious omission occurs in the discussion of modern color photomicrography. Although the ancient Lumière and Findlay plates are still described, there is no mention of electronic flash techniques or of the modern equipment and techniques for controlled time-lapse cinephotomicrography. Some photographic materials of one company are discussed, but the popular and useful Panatomic X film produced by this company is not mentioned. Only a few references are given—to Köhler's paper, a book by Morgan and Lester, an article in the *Scientific American* on microwriting, a book on microrecording, and publications of a photographic company. A few leading references to modern work would have been helpful and would have compensated, in part, for the omission of methods developed in the last few years.

Four new plates, on cast iron, steel, sago starch, and soluble coffee, have been added to the useful section illustrating good photomicrography and Allen's methods of achieving it. A comparison of the two editions reveals that the plates now show the wear of several printings.

Allen's is a personal book. Many of the methods described are basic to good