

## BOOK REVIEWS

# Marxism and Science

*Modern Science* by Hyman Levy. (Hamish Hamilton. 21s.).

*The Crisis in Physics* by Christopher Caudwell. (John Lane. 7s. 6d.).

MARXISM, IF OFTEN in a rather diluted form, is spreading very rapidly among scientific workers to-day. Most atomic physicists find themselves compelled to adopt some at least of the principles of dialectical materialism if they are to avoid idealism. For it is now useless to pretend that electrons behave as particles should do according to any modification of Newtonian mechanics. On the other hand such students of scientific history as Hogben have largely accepted the outlook of historical materialism while disowning the dialectical method.

Professor Levy, though he does not mention the names of Marx, Engels, or Lenin, makes a systematic attempt in this book to apply Marxism to physics and mathematics. There are also briefer references to astronomy, geology and chemistry. The historical side is relatively briefly though very well treated, and the main effort is devoted to expounding mathematics and physics as they are. The author has been conspicuously successful in showing how the principle of the transformation of quantity into quality permeates physics. And this is the more important because in the ordinary teaching of that subject emphasis is placed on phases of stability rather than on qualitative leaps. Thus we can give a satisfactory account of the bending of a metal rod under pressure, and of the movement of the parts after it breaks, but not of the process of breaking. Professor Levy applies this principle to the problems of aeroplane design in an extraordinarily interesting chapter.

He is perhaps less happy in the chapter called "The Unity of Opposites." It may be correct to regard space and time, matter and energy, as opposites, but there is no suggestion that their union gives rise to a struggle of opposite tendencies, and thus to a process of development. This principle is brought out more clearly in the discussion of aeroplane design. Aeroplanes have developed because they had to combine strength and lightness, stability and ease of manœuvre, and so on. In fact physics is perhaps not so well suited as engineering or biology for illustrating "the struggle of opposites" as an evolutionary principle. Professor Levy gives numerous examples of qualitative leaps, but does not generally attribute them to this cause.

His conception of an "isolate," that is to say a part of the universe considered in isolation from the rest, and therefore incapable of complete description, which he developed as a scientific principle in *The Universe of Science*, plays a less important part in this book, although it is still stressed. On the other hand some of the ideas developed in *A Philosophy for a Modern Man*, which met with a good deal of criticism from Marxists, are here dropped or at least not over-emphasised.

Like the authors of the brilliant sketch of dialectical materialism in Chapter IV of the History of the C.P.S.U. (B), Professor Levy does not mention the negation of negations. In fact this principle is rather rarely exemplified in physics, though it comes into its own in biology, and may yet do so in physics when we understand more about the detail of sudden changes in molecules and atoms.

*Modern Science* can be recommended as a real contribution to the Marxist

interpretation of science. Every Marxist student of elementary mathematics and physics should read it, and other Marxists can do so without requiring a very extensive preliminary knowledge of science. Finally it should serve to spread a knowledge of some of the principles of Marxism in scientific circles.

There are far too many misprints. One does not need the help of Freud to guess that "wave-length" for "wave-length" is a sign of the author's interest in economics; but others, including one of simple arithmetic on page 241, are less excusable, and will "give occasion to the enemy to blaspheme."

Christopher Caudwell's book, though much shorter, is far more ambitious. No one who has read *Illusion and Reality* can doubt that he was one of the very ablest men of his generation. In twelve chapters he tried to apply Marxism in detail to the critical problems of modern physics, which have given rise to relativity and the quantum theory. Professor Levy deals with them in no great detail, and his chapters on relativity do not consider some of the most interesting (and dialectical) of modern developments.

The first six of Caudwell's chapters were complete when he went to his death in Spain, but the last six are based on rough notes, and with a perhaps exaggerated piety, Professor Levy, who deserves our hearty thanks for editing the book, has left a number of obvious misprints (e.g., "existed" for "enised" in the quotation from Arnold on page 176) which might at least have been corrected in footnotes.

Caudwell attempts to explain physical theories as the shadows of economic realities. Particles represent the individuals in a bourgeois society; the field of gravitation, electromagnetic forces, and so on, being the image of the market which determines their fate. On the whole this analysis is brilliantly successful. But we must remember that Caudwell was a poet, and wrote as a poet. Hence we must pardon him such phrases as "the whole consciousness of society gathers at the pole of the owning class." I think that if he had returned from Spain he would have deleted that sentence. I have heard a better discussion of problems of pure science in the trenches above the Jarama than any which I can remember among officers mainly drawn from the owning class in 1914-1918. Even in the ancient world the few scraps of proletarian writing which have come down to us, such as the first three gospels, are far above the average quality of the literature written by slave-owners.

But the attempt to build up a philosophy which will explain the antinomies of modern physics, especially in the uncompleted chapters 7-10, is not in my opinion so successful. I intend to read them again several times, because they include ideas which may be of extraordinary importance, but parts of Chapter 7 in their present form remind me of Hegel at his worst. Caudwell's attempt to deduce the nature of the universe from that of the series of numbers 1, 2, 3, 4, . . . is perilously like Hegel's deduction of it from "pure thought." In the last chapter, where he shows that the attempt of Eddington and others to equate human freedom with atomic indeterminism rests on a wholly false idea of freedom, he comes into his own again. I know of no writer of our time whose analysis of the problem of freedom goes so deep.

I am certainly going to read this book several times over, and no student of philosophy or of the application of Marxism to science can possibly neglect it. Nevertheless I doubt if it is suitable either for the scientist in search of a philosophy, or for the Marxist who wishes to understand contemporary scientific problems, unless he has first read a good deal of science. On the other hand, Caudwell had something to say about science, and something very important indeed, though he only half said it. I believe that his book will be a quarry of ideas for philosophers for generations to come. And I

shall be surprised if some at least of his theories are not accepted by physicists. In its final form this might have been one of the most important books of our time, and one cannot read it without realising the immense loss which the world sustained through Caudwell's death, and hoping that any of his other work which survives even in fragmentary form will ultimately be published.

J. B. S. HALDANE.

# Democracy

*A Handbook of Freedom* chosen by Jack Lindsay and Edgell Rickword. (Lawrence and Wishart. 6s.).

*Why I am a Democrat*: a Symposium edited by Richard Acland, M.P. (Lawrence and Wishart. 2s. 6d.).

*Tory M.P.* by Simon Haxey. (Gollancz. 7s. 6d.).

*The Ship of State* by Edward Jenks. (Duckworth. 6s.).

*New Tyrannies for Old* by Lord Snell and others. (Allen and Unwin. 5s.).

DEMOCRACY, SAYS HARRY POLLITT in his contribution to Richard Acland's symposium, is for the people of Britain something that goes back to their very "origins and root"; the essential element of it, he adds, has always been struggle—the struggle of the common people against oppression and for more freedom, against misery and poverty and for better conditions of life. Anyone who turns the pages of Lindsay and Rickword's first-rate "Record of English Democracy through Twelve Centuries" will have this secular struggle brought vividly before them.

The passages that make up this novel anthology range from serfdom to the Socialist Movement, from Robin Hood ("He was a good outlaw, and did poor men much good") to Chartism. Here is that stout twelfth-century rebel William of the Long Beard; the carpenters of "Milehende" forming their "parliament" to resist an interfering Mayor and Aldermen (1298); the Norfolk peasantry under Robert Kett crying in 1549 "how long should we suffer so great oppression to go unavenged," and rising in arms against the "gorgeous gentlemen"; the manifesto of Captain William Thomson, heading the last stand of the Levellers of our Civil War against Parliament's Grandees—"choosing rather to die for freedom than live as slaves, we are gathered and associated together upon the bare account of Englishmen, with swords in our hands, to redeem ourselves and the land of our nativity from slavery and oppression."

I need hardly say that many of those whose opinions are expressed in the volumes under review have a different approach to democracy from that implied in Pollitt's conception. What is much more significant is the wide agreement that democracy must be active and united if it is to beat back Fascism's onslaught. Mr. R. H. S. Crossman puts this picturesquely in *New Tyrannies* (the latest series of Fabian lectures) when he says that democracy must be "either dynamic or dead. It cannot stay put"; in the Acland symposium this view is echoed by personalities as varied as Mr. Alfred Barnes, Sir Stafford Cripps and Mr. J. C. Little of the engineers.

There remain, however, those who bedevil the issue by Philistine twaddlings about Soviet "totalitarianism," equating Fascism and Communism; we get this *tout court* from Lord Snell and rather more cautiously from Professor Jenks (it is absurd to find so respectable an academic authority "equating"