

Soviet Genetics. By ALAN G. MORTON. Lawrence and Wishart Ltd. 15s.

THE ignorance in this country of the basis of T. D. Lysenko's criticism of Mendelism had the unfortunate consequence that when his well-known polemical address on "The Situation in Biological Science" appeared in English translation it was virtually incomprehensible to many biologists, even to those anxious to understand it. It was not difficult in such circumstances to turn it into propaganda against Soviet science, and this was quickly done, against shaky opposi-

¹ To be found in *Left Review* from 1936-1948.

tion. Dr. Morton's book, and the new translation of Lysenko's "Heredity and its Variability," help considerably to put the discussion of the problem back on to a scientific plane. Dr. C. D. Darlington, however, apparently finds it impossible, or undesirable, to take the opportunity offered.¹

Among the factors preventing a proper evaluation of Lysenko's position were first, a lack of knowledge of the experimental basis of his views; secondly, a lack of any detailed information on the attitude of the Michurinists to the data assembled by the Mendelian school; and thirdly, perhaps less important, the intrusion of Lysenko's views on intra-specific competition into the main discussion. Dr. Morton has succeeded admirably in remedying the first deficiency. His references to the Russian literature go back as far as 1938, and review a considerable body of research, in some cases on a very extensive scale. His descriptions of experiments in themselves go part of the way towards remedying the second deficiency; in many cases the orthodox Mendelian segregations of dominant and recessive characters are used as "controls." It would appear that the Michurinists do not reject the experimental facts, but only the conclusions drawn from them, regarding the Mendelian laws as applicable under limited circumstances.²

When this much is said, however, there remain difficulties that are not adequately met by Dr. Morton, nor by Lysenko himself. The latter states categorically,³ "the different elements of an organism, its organs, cells, and separate parts in cells, possess the property of reproducing themselves" and⁴ "the molecules of the protoplasm and the molecules of the chromosome . . . reproduce themselves both by means of growth and by means of development", but Dr. Morton (p. 52) says "to speak of the self-reproduction of the gene betrays an extraordinary confusion of thought. For a molecule of nucleoprotein can no more reproduce itself than can a molecule of water." Morton further implies (p. 127) that changes in the chromosomes merely reflect changes in the heredity of the cell, while Lysenko⁵ envisages that "changes in separate parts of a cell, such as, for instance, separate chromosomes, should (and this is frequently proved experimentally) bring about a change in the various organs, characters and properties of the organism obtained from this cell. . . ." It would seem that Dr. Morton's derogatory remarks about the chromosomes, and his treatment of Mendelian segregation (p. 125), which appears more unsatisfactory, perhaps, than even he himself admits, are not a true indication of the Michurinist position. Even if, as he suggests, the chromosomes do not persist in the resting nucleus, it remains to be explained why they appear at cell division; in fact, their appearance at this stage becomes all the more significant, implying that

¹ Darlington, C. D., *The Literary Guide*, March, 1952, p. 51.

² Cf. Lysenko, *The Situation in Biological Science*, 1948, p. 610.

³ *Heredity and Its Variability*, 1951, p. 18.

⁴ *Ibid.*, p. 27.

⁵ *Ibid.*, p. 28.

they are not simply "internal organs of the cell" (p. 54), but have a particular function in cell division. Unfortunately, although Lysenko states¹ that heredity is transmitted through the chromosomes in the sexual process, he precedes this remark by a passage in which he says that "any particle of a living body, even the plastic substances . . . possesses hereditary qualities."

It must therefore be said that the author has failed, in this respect, to clarify the situation.

The questions of natural selection, and of adaptation, which necessarily arise in any discussion of heredity, are not treated very fully, so that again we are left in some doubt as to the Michurinist position. Selection is to be regarded as "creative," in the sense that the environment alters heredity, but whether selection is also to operate in the Darwinian sense, i.e. by preserving the better adapted, is not made clear. The most relevant experimental contribution would appear to be the evidence for "shaken" heredity, but the importance of this phenomenon is difficult to assess, since very considerable adaptive changes are conceived as having no effect on heredity, unless they affect the "norm" of metabolism. Very drastic, or peculiarly specific, environmental changes appear to be called for to produce any hereditary changes, and even then must persist for several generations.

It is perhaps characteristic of the new genetical theory that it appears vague in dealing with these and other matters which were treated by the Mendelians with great precision. However, as Dr. Morton points out, it is significant of the fundamental philosophical errors of their theory that recent developments are forcing the Mendelians to become more vague in their formulations.

These criticisms are not intended to indicate any general weakness in Dr. Morton's treatment of his subject. His book answers extremely effectively the political and personal attacks on Lysenko which have been made in Western countries. In addition he has revealed the nature of the Soviet research bearing on the problem. If this is accepted at its face value, as I believe it should be, many British biologists will be obliged to revise their attitude to the controversy, and to begin, at the very least, to judge each fresh piece of evidence² from the standpoints of both theories.

If there is any general criticism to be made, it is that the style deteriorates in places, particularly where the exposition is most attenuated, into the expression of vague and optimistic platitudes. These could well be replaced by a closer documentation of, for instance, the critique of the theory of the gene.

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¹ *The Situation in Biological Science*, p. 609.

² Cf. Waddington, C. H., *Nature*, London, 1952, 169, 278.