

# LYSENKO AT BAY

THEODOSIUS DOBZHANSKY\*

FAILURE to recognize that the behavior of people is liable to be tantalizingly self-inconsistent easily leads to misconception. The elevation of Lysenko to dictatorship over Russian biology and agriculture seemed to many a proof of collapse of all science in Russia. Could anything but degradation result from replacement of science by quackery in the direction of biology and agriculture? If a blunder so egregious had been committed in biology and agriculture, could reason prevail in other fields? The disrepute which Lysenko brought on Russian science will not soon be forgotten. And yet a series of events, culminating thus far in the launching of artificial satellites, have shown that Lysenko is not a fair indicator of the level of Russian science as a whole. A prominent American scientist has now suddenly discovered that "Russians, man for man, are as educable as Americans are."

The high standing of physical and engineering sciences in Russia is evidently not incompatible with Lysenkoism. To be sure, Lysenko is no longer the lord that he once was; but neither is he hors de combat. His rise, beginning about 1930, was due to the increasingly determined backing which he received from political authorities. He never had any support from scientists, since not much understanding of biology was needed to recognize the spurious nature of his pretended discoveries. However, no criticism was permitted, and in August of 1948 Lysenko uttered the proud words: "The Central Committee of the Party has examined my report and approved it."

Lysenko's uncontested reign lasted less than four years. The first, very tentative, dissent appeared in 1952 in *Bo-*

*tanichesky Zhurnal*, a botanical periodical published by the Academy of Sciences of USSR. Since then, many critics, in this and in other publications, have pretty well demolished the whole "progressive Michurinist biology." This is, of course, not difficult to do, provided only that those who undertake the unpleasant task can express freely their opinions. That this is not the case is evident from reading even the most outspoken criticisms yet published in USSR. Michurin remains an indisputable authority, and rather pathetic attempts are usually made to show that Lysenko did not follow Michurin as fully as he should have done, rather than to question Michurin's own dicta. It is, therefore, only natural that outspoken refutations of the once sacred doctrine of Michurinism-Lysenkoism have been published by communist authors on this side of the Iron Curtain. Thus, Professor Marcel Prenant, the author of "Biologie et Marxisme," who for a time occupied a somewhat equivocal position with respect to Lysenko's claims, has now made a clean break with Lysenkoism.†

Lysenko is, however, not a man to accept defeat without last ditch resistance. In a long article in the official organ, *Izvestia*, he makes a bid for reinstatement in the official favor.‡ Both the contents and the form of this article give unusually clear insights in the workings of the mind of a high Soviet official desperately fighting for his position of power.

The gist of Lysenko's argument, reiterated again and again throughout the whole long article (almost a page in the 6-page newspaper), is that the "Michurinist doctrine" is helpful to practical

\*Department of Zoology, Columbia University, New York 27, New York.

†Prenant, Marcel. *Biologie et Marxisme. Hier et Aujourd'hui*, Paris (1948). (See my review in the *Journal of Heredity*, 40:78-79. 1949)—Prenant, Marcel. *Les problèmes biologiques. La Pensée* 72: 23-26. 1957.

‡Lysenko, T. Theoretical attainments of agricultural biology. *Izvestia*, No. 290, December 8th, 1957.

agriculture, while genetics is allegedly worthless in this respect. "For example, it is very important to know whether it is very important to know whether it is possible to control the heredity of agricultural plants and animals. Can one modify it in the direction of usefulness? The classical genetics, which is the Weismannian genetics, gives a clear answer: It is not possible to obtain directional changes in the heredity of organisms. Michurin, and his Michurist followers, on the basis of the materialist understanding of living nature, maintain that directed changes of heredity can be obtained. . . ."

It would be too much to expect most readers of *Izvestia* to be able to detect the adroitly concealed deception in the above statement. Directed mutations in agricultural plants and animals are not yet within reach, but surely no geneticist has ever doubted the possibility of modifying the heredity of these organisms in the direction of usefulness by scientifically conducted selection, aided by hybridization and perhaps by mutation to increase the genetic variance. This is precisely what scientific plant and animal breeders are doing, and with no mean success.

The genteel art of quoting out of context whatever suits them, and interpreting the quotations without regard to their authors' meaning, has been successfully used by Lysenko and his followers. The Master has not yet lost his art. We read in Lysenko's article that the eminent Swedish geneticist Gustafsson favors scientists concealing some of their findings, while the French biologist Jean Rostand is represented, on the contrary, favoring full publication and wide dissemination of scientific facts, no matter how embarrassing they may be. What Gustafsson actually wrote is that outside Russia anybody who would publish anything like Lysenko's "theories" would be laughed down, and Rostand expressed grave doubt about the validity of Lysenko's alleged discoveries.

I. M. Lerner, the California geneticist, is quoted as follows: "It is perfectly

clear that if these experiments [on 'vegetative hybridization' in poultry] could be repeated on pure-bred material outside the territories of the Soviet Union and of its allies, then no geneticist anywhere will be able to deny Lysenko's theories." The condition made by Lerner is, of course, highly unreasonable; however, it has been fulfilled anyway by the recent experiments of Benoit in France on the induction of mutations in ducks by DNA transforming principles. It is again safe to assume that a great majority of the readers of *Izvestia* will not know that Benoit's experiments are themselves in need of verification, and that Benoit's results have anyway not the remotest bearing on the kind of "vegetative hybridization" which Lysenkoists have claimed to have made in poultry and elsewhere. But Lysenko understandably dislikes to mention that extensive and careful repetition of his experiments by Stubbe, in East Germany, has wholly failed to confirm the results by Lysenko.

Hybrid corn remains, to date, the most important practical attainment of genetics. Here Lysenko has to tread gently, for this product of bourgeois genetics has won the favor of some very powerful persons in USSR. So, Lysenko uses for an ally none other than the distinguished American corn geneticist F. D. Richey! The initiation of the work on hybrid corn is rightly credited to the late G. H. Shull, but Shull's interpretation of heterosis was, according to Richey, non-Mendelian. Q. E. D.! Purely as a sleight of hand this trick is well done!

The true nature of heterosis has been discovered, according to Lysenko, by the Michurinists. In Lysenko's crystal clear language the discovery is described thus: "In the Michurist biological doctrine the viability is understood to be a result of the contradictions in the living body. The degree of the contradictoriness, and hence of the viability of a living body, depends to a certain extent on the degree of the qualitative oppositeness. On this foundation, various methods of increasing the viability of plant and animal organisms have been and are being developed."

No less impressive is the solution of one of the basic problems of theoretical biology—the problem of species. This is as follows: "On the basis of the modified and deepened materialist elements in the teaching of Darwin, the biological teaching of the Michurist school has discovered that all biological spe-

cies are qualitatively determined links of living nature, which live and develop on the basis of a single law of the life of species. The essence of the law of life of biological species is manifest in the directedness of life processes towards increasing the living mass, not the living mass in general but that of a given concrete species. Hence, in a normal, non-pathological, living body all the structures and states, all the properties and processes, all the diverse requirements of living conditions, all the diverse reactions on the influences of the not-needed, foreign, conditions of the external environment—all this is in various ways directed towards increasing the mass of this given, concrete, biological species, even if this shortens the life of a given concrete individual, and even if this results in its natural death."

Some leaders of the *Izvestia* will perhaps be impressed by the depth of this deepened teaching, though others may wonder why it needs to be stated with such grammatical incoherence. But probably not many will see what is hidden under the verbiage. Even at the beginning of Lysenko's fame, the late G. B. Shaw proclaimed, possibly with tongue in cheek, that the vaunted dialectical materialist Lysenko was really a disguised vitalist. Shaw was closer to the truth than he may have realized. Lysenko's "single law of the life of species" is a restatement of his two startling discoveries first announced apparently in 1945. One discovery was that the organism possesses a sort of an unconscious racial memory, which enables it to draw from its environment just those materials (or "conditions" as Lysenko prefers to call them) which enabled its ancestors to develop successfully. This notion was propounded some 80 years ago by Darwin's critic Samuel Butler, and especially by the German vitalist R. Semon early in the current century.

Lysenko's second discovery was his denial of competition between individuals of the same species. Conspecific individuals do not act as each other's rivals even when the population density and the food supply become limiting factors in survival. Most individuals allegedly sacrifice themselves in favor of one or more

lucky ones who will be able to survive with the resources available. This may seem to be Lysenko's one original idea, though a mighty strange one for a professed materialist. But Prenant has pointed out in the article cited above that this idea was debated by Bernardin de Saint Pierre, one of most extreme teleologists of the eighteenth century. This does not mean that Lysenko consciously plagiarized from Butler, Semon and Bernardin de Saint Pierre. Most likely he never heard their names. Neither was he necessarily a plagiarist when he announced as his own idea Darwin's long since disproved "provisional hypothesis of pangenesis." But these coincidences are characteristic. What they do mean is that Lysenko's "progressive biology" stands on the level of understanding of nature characteristic of the nineteenth, or even the eighteenth, centuries. As pointed out particularly by Conway Zirkle, the belief that acquired characters are inherited is not a generalization of any scientific facts but a part of pre-scientific folklore.

During the years of his unchallenged power, Lysenko was careful to fill most of the influential posts in academic and research biology and agriculture with his followers. A body of vested interest has been created. Lysenko's followers do their best to support Lysenko for the sake of their own survival. Moreover, the propaganda machinery of the state has persuaded masses of people that Lysenko was an innovator in science and a figure of almost heroic proportions. Almost a whole generation has learned whatever biology it did learn from books and from teachers who glorified the "progressive Michurinist science." It is not surprising that Lysenko is still able to command space in the *Izvestia*, although no longer able to silence all his critics. The failure of Lysenkoism is no longer a secret to many people even in Russia, not to speak of the rest of the world. A hodge podge of folk tales can be substituted for science only by force of repression, and then only for a while. It cannot stand criticism, even half-free criticism. Lysenko is fully aware of this.