

CHRISTOPHER YODER

## Science vs. Ideology: The Case of Lysenko

*For the duration of the cult, Stalin was ceaselessly called the greatest scientific genius of all times and all nations. In fact, of course, he was no genius, and his creative legacy is rather small. As a person, Stalin had a number of negative qualities: a hypertrophied thirst for power, suspicion, cruelty, treachery, vanity, envy, intolerance of brilliant individuals of independent character, and megalomania. These qualities created a very difficult situation not only for the country's political life but also in those areas of science which came within his sphere of interest.*

Zhores A. Medvedev<sup>1</sup>

DURING the reign of Stalin in the Soviet Union, a simplistic dogma was introduced as the only "true" Marxist biology . . . a dogma which denied the very existence of the gene. This article will briefly sketch the historical and theoretical background of this gospel, and observe the projects and career of its most infamous disciple . . . Trofim Denisovich Lysenko. It was Lysenko more than anyone else who took one of the world's leading nations in genetic and biological research back into the dark ages, seeking and obtaining as he did Party recognition and endorsement of his views.

The roots of "Lysenkoism" stretch di-

1. Zhores Medvedev, *The Rise and Fall of T.D. Lysenko* (New York & London: Columbia University Press, 1969), p. 5.

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rectly to the biological writings of Marx-Engels. These occurred before the genetic investigations of Mendel gained prominence, and at a time (around 1870) when the transmission of characteristics to progeny was understood in only a rudimentary fashion. One of the leading pre-Mendelian theories on inheritance was that of the French biologist Lamarck. Lamarck believed that environment can cause man to acquire physical and mental characteristics which are in turn passed on to offspring. It was this doctrine upon which Marx and Engels expanded.

Environmentalism was the basis. Today's knowledge of evolution sees the environment choosing for or against random genetic changes (mutations) by a process of natural selection . . . the tendency of individuals with beneficial mutated changes to live longer and to pass on their genes more frequently through mating than do individuals possessing counter-productive genetic changes. Environment is now considered to be a judicial agent; Marx-Engels held it to be an executive one. To them the environment actually *caused* the genes to change in a specific direction. In his famous theoretical work "The Part Played by Labor in the Transition from Ape to Man," Frederick Engels gives us an example:

*Thus the hand is not only the organ of labor, it is also the product of labor. Only by labor, by adaptation to ever new operations, by inheritance of the resulting special development of muscles, ligaments, and, over longer periods of time, bones as well, and by the ever-renewed employment of these inherited improvements in new, more and more complicated operations, has the human hand attained the high degree of perfection that has enabled it to conjure into being the picture of Raphael, the statues of Thorwaldsen, the music of Paganini.<sup>2</sup>*

Because of the mastery over nature to which labor had led, Engels felt man now had something to talk with each other about: thus his larynx developed to enable speech. The addition of meat to man's diet by the improvement of hunting tools, he believed, had increased the strength, independence and intelligence of man. Questionable as these ideas may seem to us today, it must be realized that at the time they were commonplace.

For the dedicated Communist at the turn of the century the amateurish biological writings of Marx and Engels became accepted fact. Jack London, the famous American Communist writer, provides us with an example which perhaps even more clearly explains the "effect" of environment (in its broadest sense) upon heredity:

*This, my professor told me, was a racial memory. It dated back to our remote ancestors who lived in trees. With them, being tree-dwellers, the liability of falling was an ever-present menace. Many of them lost their lives that way; all of them experienced terrible falls, saving themselves by clutching branches as they fell toward the ground.*

*Now a terrible fall, averted in such a fashion, was productive of shock. Such shock was productive of molecular changes in the cerebral cells. These molecular changes were transmitted to the cerebral cells of progeny, became, in short, racial memories. Thus when you and I, asleep or dozing off to sleep, fall through space and awake to sickening consciousness just before we strike, we are merely remembering what happened to our aboreal ancestors, and which has been stamped by cerebral changes into the heredity of the race.*

*... It will be noted, in passing, that in this falling dream which is so familiar to you and me and all of us, we never strike bottom. To strike bottom would be destruction. Those of our arboreal ancestors who struck bottom died forthwith. True, the shock of their fall was communicated to the cerebral cells, but they died immediately, before they could have progeny. You and I are descended from those that did*

*not strike bottom; that is why you and I, in our dreams, never strike bottom.*<sup>3</sup>

In the Soviet Union there emerged an uneducated nurseryman named Michurin who claimed to have created hundreds of new varieties of citrus. Under the tsar he had been more or less ignored by the university-trained biological and genetic specialists. When the Bolsheviks came to power, however, Michurin received state support for his research. In October of 1923, *Izvestia* ran an article covering Michurin's extravagant claims of achievement. Less than a month later the Council of Peoples' Commissars declared his farm to be a nationally significant institution. Along with a great increase in orders for his nursery came a similar tide of complaints regarding the performance of his citrus from his new customers.

Michurin continued to be ignored by the scientific community, but on his 70th birthday in 1925 the Party declared a national holiday. Until his death in 1935 the practical results of his trial and error methods were few, but by his claims he had projected the image to a hostile world of a Russia green with peasant-created fruit . . . despite the dual hardships of poor climate and pessimistic scientists. This image was exactly what the Communists wanted for the Soviet Union, and if in actuality this proletarian paradise had not yet come about it was of little matter for they knew it would. The Communists treated Michurin well, and he paid them back by hailing Party leaders as the inspirations for the "imminent reconstruction and perfection" of natural science:

*Only on the basis of the teaching of Marx, Engels, Lenin, and Stalin can science be fully reconstructed. The objective world — Nature — is primary; man is part of nature, but he must not merely outwardly contemplate this Nature, he can, as Karl Marx said, change it. The Philosophy of dialectical materialism is an instrument for changing this objective world; it teaches how to actively influence Nature and how to change it but only the proletariat is capable of consistently and actively influencing and changing Nature — this is what the teachings of*

2. F. Engels, *Dialectics of Nature* (London: Lawrence & Wishart Ltd., 1940), p. 281.

3. Conway Zirkle, *Evolution, Marxian Biology, and the Social Scene* (Philadelphia: University of Pennsylvania Press, 1959), p. 324.

*Marx, Engels, Lenin, and Stalin—those unexcelled titanic minds—tell us. (emphasis added)*<sup>4</sup>

In 1922, to rebuild the war-ruined agriculture of Russia, the Bolsheviks began to plan a federation of research institutes and extension centers along the lines of that of the United States Department of Agriculture. To head this project Nikolai Vavilov was selected, a young Soviet geneticist with dreams of his own for sculpting nature at man's will . . . not by the environmentalism of Marx but by the newly emerging science of genetics. He immediately set about developing disease-resistant species of food crops. To this end he dispatched more than two hundred expeditions to all parts of Russia and the major agricultural centers of the world, each entrusted with the collection of breeding material for the improvement of Soviet agriculture. The result was a stock of over one hundred and fifty thousand plant varieties. By 1932 there were some 1300 separate research stations employing 26,000 specialists, all working toward more vigorous and disease-resistant plants.

From the beginning, Michurin and his handful of followers criticized Vavilov's failure to stress the importance of the environment. Among these followers was a young man by the name of Trofim Denisovich Lysenko.

Lysenko was born in the Ukraine in September of 1898 . . . the son of a peasant. He graduated from the Kiev Agricultural Institute in 1925 and first received notice in 1926-27 at the Ganja Experimental Station. There he experimented with the winter planting of peas and found that if the seeds were first moistened, then cooled, they could be grown under mild winter conditions. Lysenko tried to give this first work a sensational character. He was featured in a *Pravda* article which told how he had "turned the barren field of the Transcaucasus green in winter."<sup>5</sup> At the All Union Congress of Genetics, Selection, Plant and Animal Breeding in Leningrad in January of 1929, Lysenko presented a paper on the nature of winter crops. The paper was largely ignored except to be criticized as to methodology and as to Lysenko's own claim of the importance of his "discovery". The failure of the scientific



"Lysenko looking over a field of grain."

community to take note convinced Lysenko that he had been addressing himself to the wrong people and that the established biologists had been thoroughly captured by the followers of Mendel. After 1929 virtually all of his writings were published in popular newspapers or in journals created for him by the state.

Lysenko "discovered" the phasic development of plants, whereby he felt that environmental stimuli affected upon a plant at specific phases of its development can alter its inheritable make-up. In 1929 he conducted his first experiments with "vernalized" winter wheat on his father's farm. Vernalization consisted of soaking the seed at refrigerated temperatures before planting, which Lysenko claimed increased crop yield by 40%. The practice was later shifted from winter wheat to spring wheat when it was discovered that vernalization actually caused a decrease in winter wheat yield. Premature germination of the seed under treatment could lead to massive seed loss.

Be this all as it may, in the winter of 1927-28 eight million hectares (one hectare is equal to 2.47 acres) of wheat had been lost due to harsh weather, and another 7

4. Ibid, p. 370.

5. David Joravsky, *The Lysenko Affair* (Cambridge: Harvard University Press, 1970), p. 58.

million the following year. Lysenko's experiments with vernalization therefore met with strong Party interest. He was transferred from the Ganja Station to the All Union Institute of Plant Breeding in Odessa and a special department was created under him there. The Ukrainian Commissariat of Agriculture ordered 1000 one hectare tests for the spring of 1930, but the results were destroyed by the violence surrounding forced collectivization of farms. Mass trials of spring wheat vernalization were ordered for 1932.

Foreshadowing things to come, Maksimov — Lysenko's assistant specializing in winter cereal protection — was arrested and imprisoned for criticizing Lysenko's theory on plant development. In 1934 he confessed his errors in evaluating Trofim's achievements.

The Party Control Commission and Government Inspectorate decreed in August of 1931 that all ordinary seeds must be replaced by new varieties within two years and that wheat and potatoes must be adapted for unfavorable climates within four. The Party's patience with the long process of selective breeding had begun to wear thin, and Lysenko's promises of quick results gained more and more appeal.

Vernalization was increased to two million hectares by 1935, (although there is little indication that yield had been increased through the process). Anti-Lysenkoites were hindered in their criticism by growing Party favor of Lysenko. They could vaguely question his methodology and request more substantial proofs, but they could not attack outright either Lysenko or his environmentalist views. In the meantime, Trofim had been able to achieve the dismissal of the director of the Odessa Plant Breeding Institute and he himself took the position.

Lysenko was in no way barred from criticizing his opponents. He had done so since 1927 and gradually, as his power and influence increased, the attacks became increasingly fierce — wrapping himself in the cloak of Mother Russia and Marx. In his 1935 address to the Second All Union Congress of Shock Collective Farmers (the Stakanovites of Agriculture) he demonstrated one of the basic tenets of Marxism . . . that all science is a battlefield between the forces of idealism and reaction, and the materialist-progressives (in this case Lysenko and his followers):

*Comrades, kulak-wreckers occur not only in your collective farm life. You know them very well. But they are no less dangerous, no less sworn enemies also in science . . . Tell me, comrades, was there not a class struggle on the vernalization front? In the collective farms there were kulaks and their abettors who kept whispering . . . into the peasants ears: "Don't soak the seeds. It will ruin them." . . . a class enemy is always a class enemy whether he is a scientist or not.<sup>6</sup>*

To this Stalin exclaimed "Bravo, comrade Lysenko, bravo."

The biological purge soon began in earnest. In November of 1936 Solomon Levit, a leading geneticist, was attacked at a public meeting by the Moscow Party boss as one who sheltered Nazi doctrines (genetics). Levit was arrested and eventually died in prison. Two Communist biological theorists, Israel Agol and Maxim Levin were similarly "removed". At the first of the year the Central Committee had called for the planting of five million hectares of vernalized seed in the spring, and *Pravda's* praise of Lysenko and attacks on the "barren" science of Vavilov increased.

In 1937 two successive presidents of the Lenin Academy of Agricultural Science were removed by the Terror and Lysenko was given the post. He immediately attacked the parent organization, the Academy of Science of the USSR, and its president for their moral laxity on the genetics issue. On July 26 the Council of Peoples' Commissars complained to the senior academy for its failure to sufficiently combat anti-Lysenkoist positions.

While Vavilov had come under attack at home, his stature had continued to increase in the scientific world. This added to the suspicion that he was the possessor of a foreign, bourgeois doctrine. The International Genetics Congress in Edinburgh (1937) awarded him its Presidency in a political move . . . designed to aid Vavilov in his domestic struggles with Lysenko. The Soviet government did not allow him to attend the conference.

In August of 1940, Vavilov was placed under arrest by the secret police. He was charged and convicted of "belonging to a rightist conspiracy, spying for England, leadership of the Labor Peasant Party, sabotage in agriculture, links to white

6. *The Rise and Fall of T. D. Lysenko*, p. 16.

emigres" and more. Vavilov was sentenced to death, but was instead placed in the Saratov prison and later moved to Siberia. Death came to him from malnutrition on January 26, 1943.

Vavilov's post as director of the Institute of Genetics was turned over to Lysenko. Vernalization had all but vanished from discussion, as had many other "achievements" of Marxist biology. Lysenko's claims had been sensationally introduced, milked for political gain and then, when the results were not forthcoming, passed gradually into oblivion.

Just before the war, Lysenko presented several programs to help stimulate production. These included relaxation of seed standards, a campaign for increased use of millet as a food source, and the mobilization of the Ukrainian chicken for the war against the sugar beet weevil. He spent the war years in Siberia and tried to convince farmers there that by planting their wheat in the stubble of the spring growth it would be protected from the killing winter.

With the total mobilization for war, Party regulation and oppression of religion, national minorities, the arts, and science was shifted from focus. When the war came to an end there arose criticism of Lysenko's Siberian stubble-planting idea. In February of 1947 even the Central Committee made mention of the failure of Lysenko to develop a hardy winter wheat for Siberia (first promised by him in 1935). An added slap was a resolution passed by the Committee calling for expanded research with hybrid corn.

The powers above were still with Lysenko, however, and when Zhdanov launched his extremely nationalistic program for the arts Lysenko was right in style. Environmentalism was still the only biology for "true" Soviet patriots, and the polluted and bourgeois ideas of genetics from the West (sired by a priest no less! . . . Mendel) were anti-Marx and the apex of decadence. Stalin stood by Lysenko and at the Party-packed meeting of the USSR Academy of Science in 1948 Lysenko was chosen President. His remarks to the body make clear the importance of Party dictation in this his greatest victory:

*Progressive biological science owes it to the geniuses of mankind, Lenin and Stalin, that the teaching of I.V. Michurin has been added to the treasure house of our knowledge, has become a part of the gold fund of our science.*

*(Applause.) Long live the Michurin teaching which shows how to transform living nature for the benefit of the Soviet people! (Applause.) Long live the Party of Lenin and Stalin which discovered Michurin to the world (Applause) and created all the conditions for the progress of advanced materialistic biology in our country, (Applause.) Glory to the great friend and protagonist of science, our leader and teacher, Comrade Stalin! (Applause, prolonged applause.)*<sup>7</sup>

*. . . Comrades! Before proceeding to the concluding remarks, I consider it my duty to declare the following: 'I have been asked in one of the memoranda as to the attitude of the Central Committee concerning my paper. I answer: the Central Committee of the Party has examined my report and approved it'. (Tremendous applause, passing into ovation. All rise.)*<sup>8</sup>

The last announcement was the virtual outlawing of Soviet genetics. The recantation of S. I. Alikhangan echoes the ones that came from scientists all over Russia:

*I act honestly and truthfully and go with the Party and with my Country, and if you, comrades, do not do likewise, you will be found lagging behind, you will fall behind in the progressive development of science. Science does not tolerate indecision and lack of principle.*

*From tomorrow, I will begin to rid not only my own scientific activity of old, reactionary, Weismannist-Morganist views, but will also begin to remake, to break in two all of my students and comrades.*<sup>9</sup>

The Praesidium of the Academy of Science shortly thereafter sent Stalin a letter pledging to root out "unpatriotic, idealistic Weismannite-Morganist ideology" (believers in genes).

Also in 1948, Lysenko began his greatest and most ambitious undertaking. He would plant great belts of trees to protect Russia

7. Julian Huxley, *Heredity East and West: Lysenko and World Science* (New York: Schuman, 1949), p. 57.

8. *Evolution, Marxian Biology, and the Social Scene*, p. 392.

9. *Ibid.* p. 393.

from the hot, dry winds of Central Asia and thereby transform the Soviet Union into a land of moist and mild weather. Stalin liked the idea and it was decided that five million hectares of trees should be planted by 1955. This effort became known as the "Great Stalin Plan for the Transformation of Nature". Lysenko believed it was unnecessary to space trees when planting — just plant them in bundles and they would thin themselves out to the thickness which best suited them. By 1952 over one-half of the trees had died, and by 1955 only fifteen percent remained (obviously the thinning process at work). For the first time the results of Lysenko's ideas were really being checked, and when the "Great Stalin Plan" was discontinued in 1951-52, the anti-Lysenkoists began a resurgence.

With Stalin's death, open criticism of Lysenko blossomed. He was removed as president of the Academy of Science but kept his directorship at the Institute of Genetics. By 1955 the Soviet Botanical Journal was suggesting the re-opening of the discussion of formal genetics. Behind closed doors, geneticists began once more to carry on their research. Some was done under the guise of space work, other behind a Siberian hydrodynamics lab, and an Institute of Cytology and Genetics even sprang up in Siberia.

This is not to say that Lysenko was no longer a potent force in Soviet agriculture. Khrushchev had worked with him in the Ukraine during the 30's, respected him as a scientist and was attracted by his peasant manner . . . however, the massive control Lysenko had once exerted had been greatly slashed.

In 1954 Khrushchev sent to the Politburo his "virgin lands" program, with an endorsement from Lysenko promising that high yields would result. Crops in the Soviet Union showed impressive gains up until 1958. It was during this period that Khrushchev issued his famous challenge to the West . . . "We will bury you." It appeared that he spoke too soon, for in 1958 Soviet agriculture began to stagnate. As a part of Khrushchev's program to outstrip the United States in milk production, Lysenko began feeding calves extra-rich fodder, claiming they would grow up to give milk containing 5% butterfat. He also grew some good corn with heavy use of chemical fertilizers and manure. Neither program proved a success and by 1963 it

was necessary for Russia to import grain from the bourgeois, capitalist West.

This great agricultural embarrassment was one of the major reasons for Nikita Khrushchev's replacement in October of 1964. With the pensioning off of Khrushchev a flood of anti-Lysenko articles started to appear. In November Lysenko was accused of duplicity in the murder of Soviet scientists under Stalin. David Joravsky, in his recent book *The Lysenko Affair*, listed over 100 specialists who were "repressed" and feels that these are only the tip of the iceberg. On January 27, 1965 Lysenko was



"Lysenko receiving medal from Deputy Minister of Agriculture G. K. Pysin, 1962 Exhibition of Achievements of U.S.S.R. National Economy.

removed from his post as president of the Institute of Genetics and relegated to an experimental farm near Moscow. It was later announced that all Soviet biology texts would be rewritten.

The January 1966 issue of "Soviet Life" told of the launching of a new journal to be called "Genetics" . . . it "will be an important factor in eliminating the unhealthy leftovers of the monopoly a group of dogmatists held on Soviet biology" . . . "Of all the Sciences, the Stalin personality cult had the most disastrous effect on biology. The cult arbitrarily made Academician Trofim Lysenko the final authority on all questions of biology".<sup>10</sup>

In his time, Lysenko's claims included wheat with ivy-like runners so that it was

10. *Business Week*, Feb. 26, 1966, p. 72.

necessary to plant it at only one edge of a field; carrots grafted onto parsley; and a stalk that grew oats, barley, rye, and wheat all at the same time. Some of the falsehood and quackery of the past may have been found out, but there is little indication that anything like true freedom is coming to Soviet science. Science in the Soviet Union is simply a means, directed and controlled by the Party, to the end of gaining pre-eminence in the world and bringing about the eventual triumph of Communism.

Zhores A. Medvedev, a young Soviet geneticist, wrote a book entitled *The Rise and Fall of T. D. Lysenko*. He was threatened with prosecution for criminal libel, and the government refused to allow the printing of his manuscript. Several years later, Medvedev authorized Columbia University to publish his book in the West. As

a result he was removed from his research post. On May 2, 1970 Medvedev was arrested at his home and interned at the Kaluga Psychiatric Hospital. Strong pressure from the Soviet scientific community brought about his release following a 19-day confinement.<sup>11</sup>

Grimly clenching  
his embalmed fists,  
just pretending to be dead,  
he watched from the inside.  
... from "Stalin's Heirs"  
by Yevgeny Yevtushenko

11. The account of Medvedev's arrest and detention is revealed in his new book *A Question of Madness*—the English translation of which was published December 1, 1971 by Alfred A. Knopf, New York.

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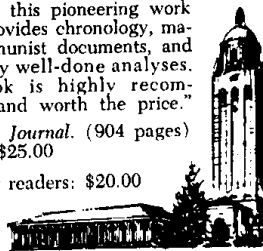
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