# SCIENCE AND POLITICS
## — The Lysenko Controversy

*ONE of those who participated in the Lysenko controversy in Britain was Dr. O. H. Frankel, Geneticist to the Wheat Research Institute in Christchurch, and a Lecturer at Lincoln College. When Dr. Frankel returned to New Zealand we asked him to elucidate the issues for the benefit of New Zealand readers. This he has now done.*

DR. O. H. FRANKEL

THE "Russian genetics controversy" has aroused a great deal of public interest in the Western world. In the Soviet Union, to quote *The Economist* of January 22, "for months on end the whole Press . . . have filled their columns with articles and resolutions on the subject. For a time even the most vital issues of international policy seemed overshadowed by the dispute."

Now the discussion inside Russia is at an end; but to understand it, we must go back to the beginning.

In the early years after the revolution, Lenin entrusted a young botanist, Nicolai Ivanovich Vavilov, with the task of organising plant improvement in the service of agriculture in the Soviet Union. Vavilov had already made notable contributions to the science of heredity. He had worked with Bateson in England and was in close touch with research workers all the world over. He was a man full of ideas, with an unbounded energy and an unusual ability for getting things done. Within a dozen years he had set up a remarkable research organisation which covered the vast area of the U.S.S.R.—in Europe and Asia—with a network of stations in carefully selected localities. Here were grown the tens of thousands of specimens which he and his colleagues had brought home from plant exploration journeys covering most parts of the globe. They discovered countless varieties which had been wholly unknown before. Back in his own stations these were observed, described, and finally used by the plant breeders in their quest for better crop varieties for their own country.

When I visited the Soviet Union in July, 1935, Vavilov was at the zenith of his working life. He had visited most of the countries in which he wanted to collect plant material; he had organised his stations and sub-stations; Russian plant breeders were about to change the face of agricultural Russia—never again was there to be a famine which would kill millions and cripple the nation. The monumental work on plant breeding, by himself and his colleagues, was on the way to being published. His work had acquired world fame. Yet within a year there began the process of disintegration which led in 1940 to his displacement as director of the Institute of Plant Industry, then to his imprisonment, and finally to his death in 1942. The man who was instrumental in bringing this about was Trofim Denisovich Lynsenko.

### The Man

What kind of man is he? This is how Dr. S. C. Harland, F.R.S., answered the question in 1933: "I found Lysenko completely ignorant of the elementary principles of genetics and plant physiology. I myself have worked on genetics and plant-breeding for some 35 years, and I can honestly say that to talk to Lysenko was like trying to explain the differential calculus to a man who did not know his twelve-times table. He was in short what I should call a biological circle squarer." Sixteen years later, this is still the judgment of the vast majority of biologists abroad, and, till last August, of those at home in Russia—but these have now been silenced.

About 20 years ago, Lysenko, taking up earlier German work, developed a method which he called vernalization, by which he was able to transform an autumn wheat into a spring wheat. This proved of doubtful practical value, for, although tried all over the world, it is now apparently not even used in Russia. However, it led Lysenko to formulate a theory of development which caused a good deal of interest in Russia and abroad. Then, finding that the *environment* — moisture, temperature, light—materially influenced development, Lysenko thought that *heredity* being a phase of development would also be subject to environmental control. Adjust the environment, and a hereditary change will follow. For example, take a non-winterhardy wheat to the far North beyond the Arctic circle, and it will become winterhardy.

Now this is contrary to all the evidence accumulated in 50 years of research all the world over. We know that the genes—the units of heredity—are subject to change, but there is no evidence that such change is ever adaptive, that is, that it is in the direction desired by, or useful to, the organism; but it is exactly this principle of adaptive hereditary change that Lysenko emphatically asserts.

Lysenko's theory is based on a number of lines of evidence. Some of these can be readily explained along the "orthodox" principles of modern genetics; others are founded on uncritical observations, and in all probability on impure material. It would require a good deal more to upset the very foundations of a science built up by hundreds of scientists working under the most critical conditions of experiment.

### Why So Much Fuss?

Now you will doubtless ask: what is all the fuss about? That a Ukrainian peasant, with a scant scientific background, ignorant of the literature of the last 25 years in the science he sets out to demolish, that this man should advance ideas opposed to those of every expert in his own country and abroad—surely this is nothing so very extraordinary? Surely he may express his views and the normal process of natural selection will sort grain from chaff.

No doubt elsewhere this would be the case; but in the Soviet Union the State takes sides, judges and condemns, and judgment is based on political expediency. Lysenko, a prominent member of the party, invoked judgment by challenging genetical theory as incompatible with dialectical materialism and with Darwinism as he understod it. The argument, conducted in the late 'thirties, was largely verbal and unreal; yet it cost Vavilov his post, his liberty, and his life. He was deposed in 1940 and then disappeared. The Soviet Government never explained, nor even confirmed or denied, the deaths of Vavilov and of other geneticists who disappeared. The Royal Society failed to receive a reply to repeated enquiries regarding the time and place of death of Vavilov, who was a Foreign Member of the Society. In 1945, however, British delegates at the celebrations of the 220th anniversary of the Academy of Sciences in Moscow learned from Russian Academicians that N. I. Vavilov, whose brother was President of the Academy, had been shot during the war while trying to escape from Russia. Later the story was told that Vavilov died while breeding frost-resistant plants in Magadan, in North-East Siberia, a penal colony in a deadly climate; but the best evidence, it seems, points to his death at Saratov whilst a prisoner, in 1942.

The final blow—which effectively put an end to what remained of genetics in the U.S.S.R.—fell last August. Having obtained the approval of the Central Committee of the party, and having packed the membership of the Lenin Academy of Agricultural Sciences, Lysenko, Vavilov's successor as its president, obtained a resolution closing down the remaining institutes for research in genetics, and elsewhere removing from office those who had persevered in opposing him.

### Russia in a Hurry

One will ask why the Soviet Government should back a movement so obviously ill-founded, which, even in the short run, is certain seriously to affect agricultural production. The main reason, it has been suggested, is that Lysenko is a "practical" man. He is said

*(continued on next page)*

T. D. LYSENKO

N. I. VAVILOV

J. B. S. HALDANE

*"Even those who defend and deny the indefensible and undeniable cannot for ever avoid the issue"*