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THE GRIM HERITAGE OF LYSENKOISM: FOUR PERSONAL ACCOUNTS

II. LYSENKOISM IN POLAND

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POLAND IS a sufficiently typical example of the Soviet Union's "ideological offensive" against the Eastern European countries behind the Iron Curtain. The introduction of Lysenkoism there was but a small part of this offensive. To begin with, a foreign reader should have some idea of the situation that existed in Poland at the time when Communism was forced upon the country in 1945.

At the end of the 18th Century, Poland was partitioned between Russia, Austria, and Prussia. The Polish territory became simply provinces of those states. That situation was extremely unfavorable for the development of the country, for education, and for science in particular. In 1918, Poland regained its independence and, in spite of an extremely difficult economic and political situation, a rapid development of its universities and its research institutes began.

In 1929, when I entered Warsaw University as a student, I attended excellent lectures on cytology given by Professor Z. Wojcicki, on plant physiology by Professor K. Basalik, and on plant systematics and geography by Professor B. Hryniewiecki, and others. At that time there was no Department of Genetics at the University, but a number of lectures on Men-

delism were given by Professor E. Malinowski, of the College of Agronomy in Warsaw. At four other Polish universities there was at that time no inclusion of genetics in the biological curriculum, owing to the lack of specialists in the subject. The situation in the faculties of agronomy and in the separate Institutes of Agronomy was rather better. At least some genetics was taught there, usually as a part of courses in plant and animal breeding, by such specialists, in addition to Malinowski, as Professor L. Kaufman and others. In Mory, near Warsaw, there was an Institute of Plant Breeding where Professor M. Skalinska, an excellent plant cytologist, headed a department. It should be stressed, of course, that Poland was an agricultural country. Plant and animal breeding was therefore of great importance, and Polish specialists had made significant achievements in the breeding of wheat, rye, sugar beets, and other crop plants. Of course, their work was at least to some extent based on genetics. Polish scientists were in good contact with Western European centers of research, and the level of science was constantly improving.

The outbreak of war in 1939 put an end to all of this. All universities — even all secondary

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schools—were closed. Underground teaching was organized, but only a fraction of the young people could attend such classes. Inevitably, its level was not high. Professors, lecturers, and the great majority of all educated persons lost their positions. In Cracow, for example, 184 members of the faculty of the Jagellonian University and the Mining Institute were arrested and sent to German concentration camps. Few of these survived. Those scientists who were not imprisoned were, for six years, entirely cut off from all scientific institutions and international contacts, and had to earn their living at odd jobs. The scientific laboratories were pillaged by the Germans of all equipment. Even most of the books were taken from the libraries. At the Department of Botany of Warsaw University, even its herbarium was removed to Germany. Then the buildings were burned. Only ruins remained.

The worst losses were in the university staffs. Numerous scientists were killed while serving as soldiers or in the underground resistance (the Home Army). Many others were simply executed in the streets.

After the end of the war, in 1945, when I returned to Warsaw, I found that all the buildings of the Botany Department and of the Botanical Garden had been burned to the ground, and only a few members of the pre-war staff had survived and returned. That was because, during the six years of conflict and directly afterwards, there was a vast forced migration of Poles. The deportations to Siberia by the Soviet KGB numbered over one million persons. There had also been deportations from the Polish territories that were included in the German Reich from 1940 on, especially after the uprising in Warsaw in 1944; and finally, after the war, from the Polish territories taken by Russia. Most of these last deportees were moved into the former German territories that in 1945 were incorporated into Poland. Altogether, it is estimated that about 6 million Poles—20 percent of the surviving population—lost their homes and were moved to new locations. The direct effect of this massive series of migrations was a break down of all sorts of social and community ties.

Directly after the war, consequently, the situation was extremely difficult and unfavorable for the reconstruction of scientific work. Yet persons with enthusiasm started to rebuild the

country, both in general and in science in particular. In spite of our ruined laboratories and our decimated personnel, scientific activity was regenerated with surprising vigor.

My personal example is instructive. Before the war, I worked in the Department of Botany of Warsaw University. I took my Ph.D. degree in botany, but even then I was greatly interested in genetics and cytogenetics, so studied these subjects on my own. Just before the war broke out I had also become interested in experimental systematics, a subject developed strongly at that time by Julian Huxley in England, by Jens Clausen in Denmark [that was before he moved to the United States], and by Th. Dobzhansky in the United States; as well as by others. In 1938 I started to study interspecific hybrids between various species of *Anemone*. During the war, I earned my living by a sort of commercial gardening near Warsaw, and thus was able to continue my research. Directly after the war was ended, while participating in the reconstruction of the Botanical Garden, I continued my research on *Anemone*, and also started a similar study on interspecific relations between the species of the genus *Geum*. I wrote a popular book on genetics, published in 1948. At the University, I started courses in genetics and made a first draft of a handbook of genetics that was used by the university students.

In 1947 I obtained a grant and went to Lund, in Sweden, to continue my studies on *Geum* under the outstanding specialist in plant genetics, Professor Arne Muntzing. After my return from Lund, I hoped to organize a Department of Genetics in Warsaw University, with full support of the Faculty of Biology.

Soon after my return from Lund, however, the first news reached Poland of the “revolution” in genetics that had taken place in the Soviet Union. It was then that I heard, for the first time, the name of Trofim Lysenko. He was the leader of the “New Biology” faction that had achieved a victory over the forces of “reactionary formal genetics.” Somehow, the name of the best-known Soviet geneticist, N. A. Vavilov, was not mentioned at all. Only later, word arrived that he had been arrested in 1940 and had died in prison in 1943. The decisive victory of Lysenko and his followers took place at a famous session of the Academy of Agronomic Sciences held in Moscow at the end of July, 1948. As is well known, at the end of that ses-

sion the participants "unanimously" declared that Western genetics was unscientific, idealistic, and metaphysical, whatever these terms might be taken to mean. The declaration was fully supported by Stalin as leader of the Communist Party, and Lysenko's "new biology" received Stalin's full support as the only truly scientific and materialistic theory of heredity constructed on a basis of dialectical materialism.

Soon the ideological offensive became extended to other countries east of the Iron Curtain. What a historically interesting phenomenon, not simply of forcing upon others a strictly political system and ideology, but also a philosophy of life, and even a scientific methodology (if the last can be considered applicable to Lysenkoism)! First, numerous speakers arrived in Poland to present the achievements of the "new biology." They delivered dogmatic lectures presenting Lysenkoist theories and the results of certain experiments mostly in plant breeding. These were delivered ex cathedra, to be accepted without reservation or discussion. The speakers used a stock of ridiculous epithets applied to all "enemies" of the "new biology," in particular to Western geneticists — such epithets as "reactionary," "backward," "antiscientific," "idealistic," "lackeys of imperialism," "lackeys of Wall Street," and the like. Particularly unforgettable, for me, was a lecture by G. M. Boshian. The numerous members of his audience were herded into a big room in Warsaw. They were predominantly biologists and agronomists, but there were also many political activists. Boshian presented the results of what he called his own research. He stated that viruses are formed spontaneously from unorganized organic matter. This term was often used, but was never defined. Viruses, he went on, in turn can give rise to bacteria, to demonstrate which he showed photographs of some kind of crystals from which viruses were supposed to be formed, and from the viruses, bacteria. Among other crazy statements, he averred that not only could *Penicillium* produce penicillin, but conversely from penicillin the mold *Penicillium* can be obtained experimentally. No questions or discussion was expected after the lecture. That was most embarrassing — the audience was treated as if composed of complete ignoramuses to whom these new, and brilliant, discoveries were now revealed.

Afterwards, of course, those listeners at all acquainted with biology were horrified — it was simply inconceivable that such gibberish could be presented in the guise of scientific discoveries. I, for one, felt humiliated to be treated in such a way. I wondered whether Boshian himself was convinced by his own evidence, or if he claimed to believe all this nonsense just to support Lysenko in order to save his own skin. My impression was that Boshian was only semiliterate and had no conception of real research work, but was profiting from "the sensational discoveries" of acellular living matter, claimed at that time to have been made by O. Lepe-shinskaya in the Soviet Union in order to make a career of her own by adding to the general muddle in biology. A considerable part of the audience, however, did not seem troubled by the lecture. Some of them seemed proud of the achievements of Soviet science. It needs to be emphasized that many of the organizers and participants in this and other Lysenkoist lectures were simply Communist Party activists with no biological education. Others, though biologists and agronomists, had had no training in laboratory research. They were taxonomists or ecologists or plant breeders. For the years of the Nazi occupation had not been favorable to learning. Young people could accept Boshian's revelations because they knew no better. They had been insufficiently trained.

It is to be understood that members of the Communist Party, whether in Poland or in the USSR, tended to adopt the attitude that party discipline requires from them a complete acceptance of whatever the Soviet Communist Party officially states to be so. On the other hand, any actual knowledge of biology, in general, or of "formal genetics," in particular was lacking — was indeed "spurious." For example, I. I. Prezent, the chief theoretician of the "new biology," was by training a party propagandist, a specialist in Marxism and dialectical materialism. He learned what he knew about genetics only from Lysenko's own papers. For such persons, to discuss genetics at all was unthinkable — tantamount to supporting the Western lackeys of Wall Street. In their jargon, Weismannism and Morganism were "reactionary" and "idealistic," and genes were simply unscientific myths. In such an atmosphere there was no room for discussion. Any form whatsoever of expressing one's personal views was

regarded as a declaration of hostility toward Soviet science.

Numerous communist party members who were engaged in propagating Lysenkoism in Poland showed a simply amazing ability to accept uncritically all Soviet statements, especially those lying outside their own specialties. Such was Professor H. Petruszewicz. I stress the fact that personally he was very kind and decent. We were good friends. Before the war, he completed his Ph.D. thesis on the ecology of spiders; and much later, in the 1960s, he became a good ecologist. The extremely negative role he played during the Lysenkoist period in Poland was attributable largely to two facts. First, he was a dedicated Communist, and had been ever since his university days in Wilno in the early 1930s. Second, he was a real believer in all the articles of Communist faith. The war years Petruszewicz had spent in the guerilla forces. Directly after the war, he did whatever the Party ordered. He rose to become Vice Minister of Approvisionnement, and then a Vice Minister of Marine Affairs. His ignorance of the problems with which he had to deal somehow troubled him not at all. I believe that in 1949 he was given the title of "Professor" and delegated to propagate Lysenkoism. He had no notion of what genetics was, but once again that did not bother him. He struggled vigorously against genetics and believed in Lysenkoism with never a doubt.

There were a few scientists who knew something of genetics, but nevertheless pretended to accept the "new biology" because they were scared. A very prominent example was that of Professor S. Skowron, who was educated in the West. In 1948, there appeared in print a textbook of genetics he had written (the wrong sort of genetics, for Poland at that time). I have been told that after Lysenko's victory in the summer of 1948, Skowron went through all the bookshops of Cracow, buying out all copies of his book. It was just at that time that Poland was full of rumors about the persecutions of "formal geneticists" in the Soviet Union, and about the disappearance of such personages as Vavilov, Karpechenko, Koltzov, and others. This was the period of the severest Stalinist terror. Hundreds of thousands, if not millions, of people were imprisoned or killed. Thus, it is not surprising that people were frightened. On the other hand, my personal experience shows

that the actual situation in Poland was far less dangerous than that in the Soviet Union.

After my return from Sweden in 1948, I still continued for some time to lecture on genetics in Warsaw University, and I made preparations to organize a separate department of genetics. Soon, however, the Lysenkoist version of genetics became official, and the Council of the Faculty of Biology asked me to abandon teaching the old, erroneous genetics and to introduce in its place the correct, new one. My answer was that there is only one genetics—that which is based on well-established evidence. Then a compromise was offered: I should teach both the "new" and the "old" genetics. I retorted that this could not be done, inasmuch as they were contradictory. I was then temporarily forbidden to teach genetics at all. Professor Petruszewicz wanted to convert me, so took me for an excursion to the Soviet Union. As a special privilege, he organized for me an official visit to Lysenko in his office at the Institute of Agronomy in Moscow, so that I could learn at the very source of enlightenment and come to change my views.

The meeting was quite strange. I was taken into a big office, where along one wall several gentlemen were seated in complete silence. They remained as mute witnesses of my visit until it ended. I have no idea why they were there. Lysenko greeted me with the statement: "If you will not believe in what I am going to say then your visit is pointless." I simply smiled. Then Lysenko started his monologue. It lasted about two hours. Since, he said, you are from the Botanic Garden, then you must have observed that in greenhouses there grow various species of plants that do not appear in the open. I attempted to point out that they were plants from warmer climates and needed to grow at higher temperatures. He retorted that that opinion was entirely wrong. The greenhouse plants never grew outside of greenhouses because they were formed there as a result of artificial conditions for growth. I did not argue any more. He continued in a similar way, with so many absurdities that I can remember only some of them. He said, for example, that plants do not take up minerals directly from the soil, but the process is mediated by soil microorganisms such as bacteria and fungi. People think that cuckoos lay their eggs in the nests of other birds, but they are wrong. In fact,

cuckoo chicks develop from the eggs of the host species. That is just one example of the transformation of one species into another, he stated.

Then he said, "If a pond was covered hermetically and its soil and water sterilized, I guarantee you that after some time there would appear in it frogs and other animals, and plants." Apparently, then, he believed in spontaneous generation. As he spoke, his mouth frothed, his voice became more and more aggressive, even though no one had contradicted him. I sat silently, since any polemics would have been pointless.

Lysenko seemed to pronounce revealed truths, to be possessed like Rasputin, and with the fanaticism of a Savonarola to be ready to send his opponents to death on the pyre. He impressed me as having some sort of mental illness, and to believe fanatically in what he was saying without any need to explain such completely unorthodox ideas. This was clearly not an auspicious introduction for converting an unbeliever into accepting his theories and views.

The next day I found out that at least some of his coworkers so much wanted to please their master that they simply falsified the results of their experiments, or described them in such a way as to substantiate his fantastic claims. At that time, O. Lepeschinskaya was claiming that cells can be formed out of "unorganized living matter," and Lysenko supported that crazy idea. From that position arose both spontaneous biogenesis and Boshian's ideas of the derivation of *Penicillium* from penicillin.

The day after my visit to Lysenko I visited the Department of Genetics at the Academy of Agronomy in Moscow. It was under the chairmanship of J. I. Gluschenko. He was a close associate of Lysenko, and also came from the Ukraine. I do not know what sort of education Gluschenko had received, but he impressed me as being a very self-confident and cunning man—so to say, a Kolchoz official. My visit having been prearranged, Gluschenko awaited me in a small office, where I was to be shown an experiment in which tomato shoots were decapitated, and the processes occurring at the cut surface that would give rise to a callus, then to new shoots, were studied. In this room stood a long table with a row of microscopes, at each of which there was a girl in a white coat. Gluschenko told me that under the micro-

scopes, in sequence, I could see the different phases of formation of new tomato shoots. This was said to occur in the following steps:

1. At the beginning, on the cut surface of the shoot, amorphous (that is, acellular) living substance is produced.
2. At the next stage, cell walls are formed, but the cells within them have no organelles.
3. Next nuclei appear, but they contain no chromosomes.
4. Then chromatin is produced, so that the cells become complete.
5. At the final stage, the cells divide and callus is formed.

After these introductory explanations, I was invited to look at the slides. The microscope preparations shown to me were so poor that, in fact, nothing at all could be seen. One could imagine whatever one was supposed to see. Even a first-year student of biology would be ashamed of making such preparations. I asked Gluschenko what fixatives were used. He was not pleased by that, but responded that of course they used alcohol. To hear this unnerved me so much that I asked whether they used vodka. The question was rightly taken to be offensive and provocative, and quite typical of the self-confident supporters of formal genetics. So the visit ended. To me it had been very enlightening. I found out at first hand that the faithful followers of Lysenko prepared their scientific results just to support his fantastic theories. In this particular case, it was of course difficult to estimate where simple ignorance of appropriate techniques ended and conscious falsification of the results began.

At that period, Lysenko claimed that one species of plant can undergo transformation into another; for instance, rye (*Secale cereale*) may be transformed into the wild grass (*Agrostis spicaventi* L.) which, on wet, acidic soil can overgrow a field of rye. Lysenko also believed that trees can often be transmuted from one species to another. Just at that time, in a journal edited by the Institute of Botany of the USSR Academy of Sciences—an institution that had had a very long and brilliant scientific tradition—some followers of Lysenko described just such a case, a transmutation of pine to birch(?) in a forest near Leningrad. (I regret that I cannot remember the exact species which were involved.) To prove this, they published a joined photograph of the lower part of a pine tree at-

tached to the upper part of a birch. Years later, after Lysenko was overthrown, research students from that same institute found the original tree and photographed it from the other side. This new photograph was published in the very same *Botanicheskoy Zhurnal (Journal of Botany)*. As might have been expected, there were actually two trees there, growing very close together, and even partly fused. Such was the crude falsification made to support the statements of the founder of the "new biology" in the USSR.

It may be safely assumed that Lysenko had many more such obliging coworkers. Perhaps most of them were ready to fabricate confirmatory results however stranger Lysenko's ideas became. That would of course be much more dangerous than just to promulgate unscientific theories. Along with ignorance and uncritical belief in those proclaimed theories there went also plain, cynical falsification of evidence.

Such was my deep conviction when I returned from my visit to the USSR. I expressed my views frankly to the authorities of Warsaw University and stated categorically that I would not teach my students crazy theories supported only by falsified evidence. The Scientific Council of the Faculty of Biology decided then to forbid me any further contact with students. Yet this was not a bad time in my life. I could devote all my time and effort to the research work on the cytogenetics and evolution of the *Geum* species. I was retained on the staff of the Botanic Garden, with no teaching duties. Since my research problem fascinated me enormously, I was really quite happy. I would not anticipate a fast career, but otherwise I suffered no harm.

In the years from 1949 through 1954 a vigorous Lysenkoist campaign was waged in Poland. Many books and pamphlets were published to further the campaign, with characteristic titles such as "On Creative Darwinism" or "Science in the Soviet Union, the Country of Socialism," (both of these by a Polish author, W. Michajlow), or "Against Reactionary Mendelism-Morganism" (translated from the Russian). Probably all of Lysenko's own publications were translated into Polish, along with five volumes of Michurin's writings. There were two books translated from English, "Soviet Genetics," by A. G. Morton, and "Lysenko Is Right," by J. Fyfe. The second of these

seemed a bit mentally deranged; whereas Morton's book was a unique instance of Soviet propaganda written with British style and courtesy.

Of course the effects of the Lysenkoist campaign were widespread and particularly damaging to the development of biology, and especially to plant and animal breeding in Poland. First of all, the entire younger generation of scientists was strongly affected. Some of them became sincerely convinced that real biological science began with Lysenko, Michurin, and other Soviet scientists. Others came to a more cynical conclusion, that it does not matter what the truth is, but only that, in order to succeed in life, one must support the ideas adopted by the ruling authority. For many party members, to propagate even doubtful ideas was accepted as being Marxist, like the matter of bowing to party discipline, and was thus beyond any criticism. Lastly, weak persons, even if they realized that there was something wrong with Lysenkoism, preferred to suppress their doubts, or at least not to express them openly in the prevailing atmosphere of general terror. These persons were prepared to accept any compromise with conscience in order to achieve personal safety, or maybe advancement. This last class of persons, however, was not numerous. A majority of the young scientists and university students lacked any conception of Western genetics and found such notions as the inheritance of acquired characters intuitively appealing.

Among agronomists, the concept of the inheritance of acquired characters seemed to account beautifully for the adaptation of organisms to the environment, and was thus tacitly accepted. Early in the Lysenkoist period in Poland an Institute of Plant Breeding and Acclimatization was established. For many years, even after Lysenko's fall, the post of director of this institute was held by Professor J. Lekczynska, a devoted Lysenkoist and also an astonishingly ignorant person. She was nominated for membership in the Polish Academy of Sciences (although she was not elected). In her Institute she stimulated procedures of plant breeding according to Lysenko's recipes. That is to say, if inheritance means assimilation by an organism of environmental factors, then any plant can be forced to grow in any climate. That belief accounts for the term "Acclimatization" in the name of the Institute. Accordingly,

numerous attempts were made to grow rice in the Polish lowlands, while in the Tatra Mountains coffee bushes were planted. In both cases the results were easy to foresee. Fortunately for the country and its people, in most of the plant breeding stations traditional methods of crossing and selection predominated.

Much heavier were the losses in general and agronomic education. In the late 1940s and in the 1950s, new school books were printed, for the first time since the end of the war. The authors were handpicked by the Ministry of Education, which applied a sole criterion of political orthodoxy. The textbooks of biology were full of Lysenkoism; Mendelian genetics was mentioned only in certain derogatory remarks. Along with the school books, dozens of brochures were published, like those mentioned previously. Not only were the contents of the books on a shamefully low level, but even "politically neutral" subjects were full of errors. The achievements of Russian scientists were overstressed; those of scientists of other nations were diminished in importance, or simply omitted. The situation was neatly summed up in a joke current in 1956: the founder of geometry was the great Russian scientist Pietia Goras (i.e., Pythagoras).

In Poland the period of Lysenkoism ended in 1956, but some of the textbooks remained unchanged for several years afterwards. As a result, teenagers finishing the secondary schools were convinced (or pretended to be) that biology was developing only in the Soviet Union, while in other countries scientists were idealistic, dogmatic, or characterized by other opprobrious terms, the real meanings of which they did not know. In Poland, in order to be accepted into a university, one must pass examinations. The answers given to the questions on the entrance examinations for the Faculty of Biology were often quite embarrassing, silly, or amusing. The principal author of the biology textbooks for use in the schools was the Polish parasitologist, W. Michajlow, who for many years worked in the Ministry of Education. He started writing textbooks and many sorts of propaganda brochures in the late 1940s, and continued for many years to do so. He was often referred to by the candidates in biology as a "great Soviet scientist." Another wrote that the theory of evolution was created by two great Soviet scientists, Michajlow and Darwin. That

poor student could not even realize how far apart Darwin stood from other persons he heard named in school.

The Lysenkoist propaganda extended from the primary school all the way up to the university. Young people had no chance to deal with it critically, on strictly scientific grounds. The only source of skepticism lay in the fact that the Lysenkoist propaganda came from the East, together with Communism. This realization was often expressed in jokes. For example, according to certain young Poles the most famous achievement of Michurin was to make a hybrid between an apple tree and a dog. The hybrid would bark whenever a thief tried to steal any apples, and it was capable of watering itself. Unfortunately, the few persons in Poland who could have supplied valid arguments against the "new biology" remained silent. Some were afraid, and pretended to approve it; others simply had no possibility of expressing their opinion openly.

At the very beginning of the Lysenkoist propaganda in Poland, the concept of the inheritance of acquired characters was vigorously supported by one outstanding biologist, Professor Dembowski. He was a well-known animal psychologist who, before the war, had worked in the University of Wilno. In 1946-47 he was given a post as scientific attaché in Moscow, and there he worked in the Institute of Experimental Biology of the USSR Academy of Sciences. Subsequently, he held positions in the University of Lodz and in Warsaw. In Warsaw, he organized the Institute of Experimental Biology, and participated in organizing the Polish Academy of Sciences, of which he served as its first president. In the years 1952 through 1956 he was also president of the Polish Parliament. Even before the war, he was known to be very critical of Mendelian genetics, and expressed his criticism in papers he published in the *Zeitschrift für Abstammungs- und Vererbungslehre* (now entitled *Molecular and General Genetics*). Thus, among Polish biologists, he was the first to commence propagating the "new biology."

I believe the first Lysenkoist conference in Poland took place in March of 1949. Dembowski was its organizer and was also the principal speaker. Officially, the organizers were a newly formed Society of Marxist Biologists—the very name speaks for itself—and the edi-

torial board of the journal *Nowe Drogi* ("New Ways"), which was the principal ideological periodical of the Communist Party. The participants in this conference were predominantly drawn from various academic schools in Warsaw, but there were also some from other places. They were biologists, agronomists, psychologists, and also some party activists only loosely, if at all, connected with biological subjects. The proceedings of this conference were edited by Dembowski under the title "On New Genetics". That may explain why no geneticists were invited to attend. The conference took place shortly after the famous session in Moscow where Lysenkoism was finally accepted as an integral part of Communist ideology.

Dembowski began his introductory speech by describing what great losses in Soviet agriculture were due to the wrongful ideas of Mendelian genetics. No details were given. Then he passed on to describing the great successes made in plant breeding by Luther Burbank, such as the production of onions with the fragrance of magnolias. He concentrated in more detail on Michurin's achievements. Then he described Lysenko's brilliant results and attacked Mendelian genetics. He claimed that Mendelian segregation need not in fact reflect statistical regularities and therefore led to no important successes. The long and elaborate lecture was closed by a statement that the speaker fully supported the opinion expressed by the Soviet "philosopher" Prezent that Western genetics was crumbling and had no future. Thus Dembowski presented the new Soviet genetics and contrasted it with the "formal" genetics of the West, which, he affirmed, was entirely in error. Dembowski said, for instance, that "Darwin's idea that the inheritance of characters can depend on material particles had adverse effects on the further development of genetical research. The ability of an organism to react to environmental factors in a specific way cannot consist of particles. Such views have no biological meaning." Instead, Dembowski supported Lysenko's opinion that "sex cells originate and are built from particles that are formed from substances coming from different tissues and parts of organisms and undergoing numerous (but regular) changes." [There seems to be some confusion here, since Darwin's long-abandoned theory of pangenesis fits the quoted opinion of Lysenko quite perfectly.]

Obviously, Dembowski, being an animal psychologist, was not up to date in respect to the current concepts of Western genetics, but he was prepared to deal bravely with the rather unclear concepts expressed by Lysenko.

In the discussion that followed, a number of speakers who belonged in a political meeting rather than in a scientific conference, declared their loyalty to the party line. Typical was the speech by W. Michajlow, already mentioned above:

... [This] Soviet experience must be used and creatively adapted by us. . . . We must correct the programs in the secondary schools, universities, and particularly in agronomic education

Other speakers, plant or animal breeders, more or less explicitly expressed their support for Dembowski's opinion and declared that they would introduce the new ideas into their respective fields of work. Still others, who were physiologists, botanists, or even psychologists, spoke without really adding anything. The only speaker who defended any aspect of genetics in this conference was Professor M. Korczewski, a plant physiologist from the College of Agriculture in Warsaw. He asked Dembowski, "Are there any attempts to clarify what is the material substrate and chemical transmitter of hereditary characters? . . . Are they compounds involving desoxyribonucleic acid, of which genes are supposed to be built, or other substances? . . . What is their relation with the chromosomal apparatus?" Korczewski also asked whether any attempts were made to find out what sort of substances were exchanged between the types used in "vegetative crosses," that is, in grafting experiments.

In his summary of the discussion, Dembowski stated that he had nothing further to say to most of the discussants. In answer to Korczewski, he said that he himself did not know what geneticists think the gene really is. "Geneticists think that the genes are enzymes. . . . In classical genetics enzymes are foreign bodies. . . . It was very unfortunate that chromosomes are stained easily by nuclear dyes. They are thus particularly noticeable in microscopic preparations and thus attract attention and look as if they were important. That was pure accident. . . ." and so on.

Thus did the highest level of Party and

Science resolve the controversy between the old and the new genetics. Thereafter, the "new biology" was to dominate exclusively and was to be developed not only by scientists but even by kolchoz members in Poland. In this way the development of genetics in Poland was affected seriously by the ideas of Dembowski, who had never even heard about DNA.

Not a few other biologists held similar views. For example, a zoologist who at this critical time was dean of the faculty of biology at Warsaw University described the phenomenon of chromosomes in a public lecture in the following way:

When a nuclear dye such as gentian violet is used, the whole preparation is heavily stained. Chromosomes become visible at a certain point in the removal of the dye. But when this process is continued, the chromosomes simply disappear. Hence the chromosomes are just temporary pictures observed during removal of the stain.

This man was a zoologist specializing in taxonomy and zoogeography and, probably, for many years had not made, or even looked at, any cytological preparations. But he faithfully supported the regime.

Soon after the Dembowski symposium, W. Michajlow had conferred upon him by the government the title of professor, and he began writing textbooks for the schools, pamphlets and articles, as aforementioned. Largely owing to his zeal, Lysenkoism was included in the curricula of the lower schools and, though to a lesser extent, even in the programs of the universities and research institutes.

Of course, it was not sufficient to forbid the teaching of the ideologically wrong, reactionary, idealistic, and even racist Western genetics. It was necessary further to train properly the future university teachers. A number of courses in the "new biology" were organized, chiefly by W. Michajlow and K. Petruszewicz. The longest and most thorough of these courses was presented in the summer of 1952 in Dziwnow. Here, young biologists assembled from different universities were subjected for an entire month to an intense brainwashing. The main lectures given there were edited by Petruszewicz, Michajlow, and S. Skowren and printed under the title "Problems of Creative Darwinism." The book, 756 pages in length—a sort of bible

of the "new biology"—appeared in print at the end of 1952. In Poland, at that time, only the most politically important books were printed as promptly as that. Over twenty lecturers participated in the course. Two of them, although in other fields of research, actually knew Mendelian genetics quite well; notwithstanding that, however, they vigorously supported Lysenkoism. The rest of the lecturers were drawn from such fields as evolution, taxonomy, embryology, or paleontology. They presented different kinds of data from their respective fields, carefully avoiding any genetical interpretation.

In his introductory chapter, Petruszewicz appealed for a struggle against idealism in science, particularly in genetics. This needs some comment for Western readers. At that time everything that was not accepted as a part of the official philosophy of dialectic materialism was, by definition, considered to be "idealistic." The meaning of this pejorative adjective did not correspond to any notion of idealism in the Western world. The struggle with "idealism" in genetics was a kind of slogan used by Lysenkoists against the notion of the gene as a hereditary particle that is not changing directly and adaptively under the influence of the environment. This resulted, of course, from complete ignorance or rejection of all experimental evidence of the nature and role of the genes in heredity. DNA was not even mentioned during the whole course. In reality the Lysenkoists should be called "idealistic" as they claimed preconceived ideas without any experimental proof.

Petruszewicz stated that the purpose of the course was to teach the young participants the principles of creative Darwinism, and in particular to present the achievements of Michurin and Lysenko, who had succeeded so brilliantly in directing and speeding up the evolutionary processes, so that they might "become a conscious and determined cadre prepared and ready for the battle for the new biology." Then he delivered a long lecture on the development of the idea of evolution, and the essential roles of Michurin and Lysenko in the foundation of "Creative Darwinism." This lecture was followed by a series of others presenting the evidence for evolution from various fields of biology. All speakers deftly avoided entering into the controversy over genetics. There

was, however, also a series of lectures fully approving the slogans of the "new biology." Such was Professor S. Skowron's lecture, "The Inheritance of Acquired Characters." In the beginning of his contribution, Skowron said ". . . the inheritance of acquired characters is an essential premise of modern genetics and of Darwinism as a whole. Recently this premise has been fully proven." Such a statement ex cathedra was intended to prevent any discussion of the subject. Next, this author presented a wide repertoire of "proofs" of the inheritance of acquired characters, on the basis of "experimental data" derived from the "new biology." He even mentioned the possibility that the nuclei of cells and the sex cells can be formed from acellular living matter. To do this was particularly reprehensible on the part of Skowron, who had done research in genetics in the laboratory of Winge in Copenhagen, and had subsequently written a textbook of genetics. Can one not say that Skowron proved himself to be a good example of adaptation by "assimilation and transformation of environmental factors" on the part of a living organism?

Other chapters, such as "Inheritance and Some of Its Regularities," by M. Birecki, and "Transformation in Inheritance," by A. Makarewicz and K. Kaniewski, consisted chiefly of incoherent slogans pertaining to the "new genetics." These authors were agronomists by education, had hazy ideas about biology, and no experience even in plant breeding. Their contributions resembled nothing so much as speeches made in a political forum, and assumed absolute truth on the basis of authority. They stated that genes do not exist, that Mendelian segregations happen only from time to time, and that all characters are acquired through assimilation of environmental factors. They gave supposed examples of the transformation of one species into another. The general trend of their argumentation was that it is not at all surprising that genes and chromosomes do not play any role in inheritance. Under bad conditions, rye degenerates into *Agrostis*; ". . . if there is no proof one should look for it; the conscious transformation of organisms should be achieved through one's own efforts." One may assume that with real faith any miracle can happen. Of course, as party members and good believers, these persons delivered their revelations with conviction and zeal.

Very curious was the fact that the course included lectures on Pavlovism. On this subject the contributors were Professor A. Jus and his wife. At that time Jus was a director of a large psychiatric clinic. It was well known that both the Professor and his spouse were actively involved in the shameful procedure of remanding the political enemies of the regime to psychiatric hospitals, a practice long and widely employed in the Soviet Union. In his lecture in the Dziwnow course, Jus gave the following reasons for presenting Pavlovism to the students: "Pavlovism is also connected with the theory of Michurin and Lysenko, in respect to its entire attitude. The purpose of research [in this field] is to increase the grip on the subject under investigation in order to modify and correct it." As a consequence of his activities in modifying and correcting humans in psychiatric clinics, Jus later found it expedient to emigrate from Poland.

Passing over certain other chapters that do not bear discussing, we come to the two final lectures: "On Soviet Creative Darwinism," by Petruszewicz, and "The Social Role of Science," by Michajlow. Both chapters were strictly propaganda, as they dealt mainly with the philosophical basis of Soviet "Creative Darwinism." The main conclusion they reached was that in capitalistic countries the theory of evolution had gone entirely astray and led to entirely wrong conceptions, while its practical applications led to war, starvation, and unemployment. Only Creative Darwinism, as developed in the USSR, is based on dialectical materialism and consequently leads to both theoretical and practical conclusions. These two speakers appealed to younger scientists to develop the "new biology" actively and to apply it to agronomy.

This short summary of the Dziwnow course may provide some idea of how much time and effort went into Lysenkoist propaganda in Poland. Numerous other, usually shorter, courses of a similar nature were created. The role of DNA in inheritance was never mentioned, even though in the 1950s such knowledge was well advanced. Consequently the young people were misled and biased by hearing such constant stress laid on the ideological aspects of science, to say nothing of the effect of the ridicule heaped on "scientific adversaries," namely, non-Marxist scientists who by very definition must be

wrong. Young students, moreover, had ample opportunities to realize that if they did not accept Lysenkoism, with all its slogans, they would be excluded from the local scientific community and would be unable to carry out any research. On the other hand, certainly Lysenko's slogans, his attacks upon recognized scientific authorities, and particularly the brilliant prospects promised by the "new biology" carried a real appeal to any person who completely lacked any idea of what science really is. Lysenkoism was supposed to be an integral part of Communist ideology; and Communism, while hated by a majority of the people, was fully approved by others. A former Michurinist of Jewish origin who, as a boy of 7 to 13 years of age had particularly terrible experiences during the war, recently wrote:

After the war I perceived the world as a terrifying place The only ideology and the only force that promised a good and just world was Communism—destroyer of the Nazis. I believed that Communism is right, I wanted it to be right, it had to be right for me to go on living In 1948 I was a schoolboy and had no idea about genetics. I understood very little of Lysenko's speech But clearly that was my fault, I did not know enough, I did not understand.

As a result of the widespread propaganda, Lysenkoism took full control of biology and agronomy. In numerous plant and animal breeding institutions, Lysenkoist "methods" were introduced, at least nominally. Many experiments on "vegetative crossing" were performed, or were claimed to have been performed. Somehow, their results were never reported. I have no way to evaluate the amount of economic loss that resulted from the application of Lysenkoist methods, but certainly they were considerable, as in the USSR itself. Fortunately, a majority of our plant breeders mouthed the Lysenkoist rhetoric but, in actuality, applied strictly traditional methods of crossing and selection in their work.

The chief losses were certainly in general education. Several generations of young people who had finished secondary schooling during and after the war came to the universities with a poor knowledge indeed of biology. The later generations were, if anything, even more ignorant, since they were taught nothing but

meaningless slogans. Agronomy students were conditioned by hearing repetitions of Lysenkoism. After such a course in agrobiolgy, the students were unable to do anything more than repeat a brainful of slogans.

In Poland, Lysenkoism was abandoned in 1956. At that time Professor L. Kaufman, an excellent animal geneticist, and I were able to visit France and Great Britain for a few weeks, in order to restore scientific and personal contacts with geneticists in the West. However, not until 1958 was I permitted to resume lecturing in genetics. The first modern textbook of genetics to reach us was *General Genetics*, by Adrian M. Srb and Ray D. Owen (W. H. Freeman, San Francisco, 1952). It was translated by my colleagues under my own editorship, and published in Polish in 1959. Only in the 1960s were courses in general genetics gradually introduced in other Polish universities. For ten years, then, teaching and research in genetics had been completely suspended in Poland, and not only that, but also information about the very rapid progress in genetical research going on in the world reached only a very few biologists, and in scanty amount.

At this point I would like to assure my colleagues and friends in the West that the entire Lysenko affair had nothing at all in common with true scientific discussion, differences in research results, or the opinions or interpretations of new experimental data. Those who have been exposed only to real science and real scientific discussions and have observed the phenomenon of Lysenkoism only from the outside can scarcely have any basis for understanding or imagining what went on in the Eastern part of Europe. It is simply incredible. Various discussions about Lysenkoism, in particular those involving leftist Western biologists, are so naive that one must laugh. First of all, it is necessary to understand that the majority of the so-called experiments cited to support Lysenko's claims were simply falsified by his coworkers. These persons, however well they may have known the elementary rules of scientific honesty and precaution against bias, had to present their superiors with whatever results they knew were wanted. This was essential if they were to survive. The experiments were performed without controls, and the results were not analysed statistically. Lysenko himself did not understand statistical methods and

simply hated statistics. To him, they seemed a whiff of the rotting West and were spurious for Soviet scientists. Besides, belief in what he proclaimed was required, so that persons saw what they were supposed to see, as in the earlier-mentioned experiments of Gluschenko. Lysenko himself had a great capacity for blind faith—he was possessed by this phenomenon, not so rare in Russian history—but whenever it seemed necessary he was quite prepared to cheat. Some years after his fall, I was told in Russia that when Lysenko had lost all of his high posts, he became chief of a milk farm in a kolchoz near Moscow. From there he sent annual reports indicating that the cows under his care were giving more and more milk every year. This, he claimed, was attributable to his methods, which he failed to disclose. A special commission set up to verify his reports found that the data had been fabricated. I do not know whether this tale is true, but it certainly seems probable. Afterwards, Lysenko was given a job as a gardener near Moscow, and in that post he did really take good care of the gardens around the dachas of Soviet party leaders.

The attitude of some Western scientists toward Lysenkoism is naive. In this great pseudoscientific discussion, even the philosophical implications of dialectical materialism for the “new biology” were in fact not really at stake. The entire philosophical setting was worked out by Prezent and some other “politicologues.”

Lysenko himself would have been quite incapable of exploiting such arguments. In my opinion, Stalin's approval of Lysenko's battle with academic circles was just a fragment of his design to split up society and destroy whatever social groups he considered to be ideologically alien.

In the Western nations there were also at the time, and since, persons who were Communists or sympathizers. Many of them leaned toward a support of Lysenkoism. In France, for example, Lysenkoism was strongly supported by the French Communist Party, and such ideas survived long after the fall of Lysenko in Russia. Disputes with such persons were made possible because they existed on the periphery of normal scientific life. It would be interesting to know what would have happened if the followers of Lysenko could actually have forbidden their opponents to carry on research on genetics and molecular biology in the Western countries. Fortunately, that is unimaginable in truly democratic states. Characteristically, a few years after the final end of the Lysenko episode in the Soviet Union, nobody in Moscow was even willing to mention it, so shameful did they feel it to be. It simply vanished.

It is my hope that this very personal account of my own experiences during the Lysenko affair will enable future historians to see it from a different point of view.