

Nikolai Koltsov, *How the Phenomena of Life Are Being Studied* (Moscow, 1928)

There is no person who has not asked himself: What is life? How do living beings differ from the lifeless bodies of nature? How does a human differ from other animals and plants? A human is born, grows, ages, and dies; where does he come from and does he disappear at death? What is health, sickness, death? Everyone seeks an answer to these questions.

Vast masses of the population across the centuries and among all nations have been satisfied with the ready answers to these questions given by contemporary local religion. These answers were usually completely unfounded—each religion resolved them in its own way—but they were handy, the majority believed in them, and thus they usually met no objections. Only scholars [scientists] unsatisfied with traditional responses sought new answers with better bases. Little by little biological science arose, the “science of life.” It broke down many biases, but, naturally, far from all the questions posed above were resolved by it once and for all. Along with the development of biological science new, more profound questions arise, often possessing great significance for practical life. All of medicine, agriculture, and many important branches of industry are founded on the achievements of biological science. Some biological discoveries like the Darwinian theory of evolution by means of natural selection transformed the entire worldview of the human being and served as starting points for a new historical era. The germ theory tied to the names of the great biologists Pasteur, Koch, and others has brought about a tremendous revolution in how we maintain national health and made possible the rise of the megalopolises of our time.

Naturally great attention is being allocated in all civilized countries to the development of biological science with its various branches. Specialized research institutes for biology are springing up that are entrusted with the task of deepening our knowledge of life. These research institutes are not expected to satisfy the direct demands of life. Previous experience has shown that even a pure theoretical discovery of biology abstracted from practice quickly finds application in medicine, in agriculture, or even in the preparation of food products and other technical productions.

Nearly a decade ago in Moscow the Institute of Experimental Biology was founded by the People’s Commissariat of Health (Narkomzdrav) along with a number of different research institutes. In this essay I want to describe the kind of work this Institute has carried out under my leadership during this time and how much this work responds to the interests and demands of the nation that provides the means to carry out this work. (3-5)

[Extended descriptions of facilities and research agendas follows. The final item mentioned: studying the genetic properties of generations of mice in the lab.]

Many of the Institute research agendas noted above already concern questions of heredity and variability. These important problems attract particular attention from modern biology. The genetics and eugenics departments of the Institute are entirely devoted to working these out.

Every modern biologist, of course, is an evolutionist and cannot but acknowledge, following Charles Darwin, that animal and plant forms have changed over the course of time and that the organisms existing today differ from the ancestors who populated the earth millions of years ago; our own human ancestors ran on four legs, were covered with fur, and were unable to converse. But when Darwin wrote his remarkable books, he was not in a position to

penetrate sufficiently into the mysterious phenomena of heredity and variability, from which he constructed his theory of evolution. Only in our century, two and a half decades ago, were solid foundations for the truly scientific study of heredity put down [Mendel rediscovered c. 1900], and still later it became possible to study the very process of new traits arising among animals and plants, i.e., variability. A new science was founded, *genetics*, which strives not only to explain the evolution of organisms, but also to create new forms of animals and plants at will. Earlier only descriptive and comparative methods were used to study evolution. The method of genetics is experimental.

Experimental genetics arose in Central Europe and quickly developed in England and America, but arrived here in Russia with significant delays. Incidentally, some countries with highly developed science like France and Italy are lagging even more than us; even now interest in genetics is very weak and there are no scientific institutions where any kind of research in genetics is carried out intensively. In the realm of botany and practical horticulture it is true that the important significance of genetics, not only theoretically, but also in applied terms, is so apparent that our botanists and agronomists as well could not but surpass zoologists and animal breeders in this regard. At present genetics occupies a primary place in the tasks of so large and advanced an institution as the Lenin Institute of Applied Botany, with its ancillary stations scattered across the USSR. But in the realm of animal genetics only a few specialists took an interest in genetic questions before the revolution in Russia, and there was not a single university chair in genetics nor a single research institution that was in any way suited to experimental work. But it so happens that a well-defined configuration of resources is needed for experimental genetics, and the opportunity to cultivate a large quantity of experimental animals under close supervision.

When I started organizing the Institute of Experimental Biology, I turned my attention in the first instance to creating the required configuration for carrying out such works. Breeding pens for chickens, doves, rabbits, porpoises, mice, and rats were built at the Institute. It quickly became apparent, however, that keeping a large quantity of experimental animals within the confines of Moscow was difficult and costly. These difficulties were especially magnified in the hard years of general devastation [i.e., civil war]. In order to save all the work that had been started we had to transfer the breeding facility outside the city.... (31-33)

[Eventually: the fruit fly Drosophila and its genetic mutations, which provide many clues about how to improve plant and animal breeding.]

There is no doubt that experimental genetics at present has a solid foundation in the USSR, and not only in its botanical-selection agendas but also in its zoological-animal breeding ones. In fall 1927 in Berlin the World Genetics Congress was founded, gathering nearly 1000 scientific biologist participants. This was as it were a review of all the scientific powers in the realm of genetic science. Of course the majority of the participants were the German hosts of the congress. But among the foreigners first place belonged to the scientists from the USSR, while the Americans stood in second place, and the English in third. The serious participation of Russians [sic!] in developing the science of genetics could not but be noticed. Erwin Baur, the chairman of the congress, published an interesting article in *Die Naturwissenschaften* about the great importance of genetics in the improvement of practical animal breeding, and he lamented the lack of attention to this problem from the German government. In doing so he set the “neighboring country,” the USSR, as an example to his government, a country surpassing Germany in the matter of staging organized scientific researches in genetics, and

predicted the decline of German animal breeding in the event that this mistake would not be rectified.

* *

*

The eugenics department essentially represents only a special arm of the genetics department and has the task of studying human heredity and variability and developing scientific bases for improving the human race [*poroda*].

There is no place for experiments on humans, of course; we are restricted to examining heredity among families. For several years the head of this Institute department has been V. V. Bunak, a professor of anthropology. In this time he and his associates have published works on hair and eye color among humans, the external traits most accessible to extensive examinations. In addition he and G. V. Soboleva have carried out examination of 100 pairs of twins located in Moscow. So-called identical twins offer very intriguing material for genetics, since on the basis of theoretical considerations we may accept that all traits that make them similar are heritable, and the traits that make them different develop as a result of the influence of external conditions. At present the department is carrying out familiar examinations on the heredity of hiccuping, alcoholism, deaf-muteness, and in a series of Moscow primary and secondary schools individual examinations of the psychological abilities of school children are being carried out according to the method of Professor Rossolimo. Results of a questionnaire about fertility among Moscow science and arts figures have been published showing the extremely low fertility of this valuable population group. (40-42)

[*Research on blood groups...*]

Recently the eugenics department has begun studying racial pathology. If diverse races [*rasy*] are rather sharply distinguished from one another by skin and hair color, by hair and eye shape, by height and other indubitably hereditary physical traits, then one may assume a priori that their pathological peculiarities should also be diverse; one may expect that illnesses rare among other races will be widely prevalent among this one and vice versa. Of course, work studying racial pathology should be organized in collaboration with local medical authorities, and with this in mind I undertook a trip to Central Asia in spring 1928. I gave lectures to physicians in Tashkent, Samarkand, Bukhara, and Ashkhabad, and I reckon that in short order we will manage to pose this research agenda in many locales in Central Asia along these lines.

* *

*

When it comes to popularizing the eugenics idea in the USSR the Institute of Experimental Biology has played a pioneering organizational role. In connection with its work in Moscow the Russian Eugenics Society was founded, which has already held more than 100 public meetings; affiliated departments of this society have opened in Leningrad and Saratov. A Russian eugenics journals published by Gosizdat has been founded. The sixth volume of this journal is already coming out this year. Of course, in the early stages both here and in other countries some distortions of the eugenics idea are possible, generating passionate debates at

times. But the basic notion of eugenics permits no doubts: Humankind should concern itself with the interests not only of its own generation, but of successive generations. Humankind is changing from generation to generation, but the direction of this evolution is not specified beforehand, and it may equally go forward and improve as well as degenerate. Humankind has achieved great power over nature, and it should be able to direct further biological evolution of the human organism along its desired path. (44-45)