

THE PURGE OF RUSSIAN BIOLOGISTS

By David James

"Purges" are a commonplace in Stalinist Russia, and the news that biologists are to suffer the fate of musicians, artists, politicians and administrators, would not seem particularly startling. But in reality it is a new departure. Previous heresy-hunts covered only the world of man and his social institutions. Now Nature herself must toe the line.

The "new genetics", founded by one Michurin, and whose arch-priest is T.D. Lysenko, were known in Russia before the war, as a minority trend. Most Russian biologists held ideas in common with their Western counterparts, and their work was held in high regard. In August this position was changed. "Reactionary" biologists were dismissed from leading posts, and Lysenko's ideas were declared the only true faith. His report to the Lenin Academy of Agricultural Sciences has now been published in English, and helps to throw light on the matter.

LYSENKO'S "MARXIST" GENETICS

Lysenko's scientific ideas are almost inextricably mixed with his political and philosophical views, and it is difficult to deal with them alone. But the following is a very brief sketch.

The generally accepted Morgan-Mendel theory of heredity states that inherited characteristics of organisms are determined by ultra-microscopic bodies called genes. These are located in the chromosomes, which are fibre-like materials in the nucleus of each cell. Every body-cell contains two duplicate sets of chromosomes (cases are known of more than two, but they are a minority). When the cells divide during the organism's growth the chromosome outfit divides too, and each new cell contains an identical double set of chromosomes to the original. Now the reproductive cells -- sperms and ova -- are obtained by a "reduction division", which halves the chromosome outfit: these reproductive cells contain only one set of chromosomes. Fertilisation consists of the uniting of two such cells -- one from the mother, one from the father -- making a new cell containing a normal double set, which can then divide and re-divide as the embryo grows.

According to this theory, the genes are normally unaffected by the conditions of life of the organism. Since they are the sole bearers of hereditary characteristics, these are also unaffected. In other words, acquired characteristics are not inherited. Changes in the genes - "mutations" - normally occur spontaneously and are not evoked by external conditions. It must be understood that this theory does not deny the effect of the conditions of life on the organism, for instance inherited characteristics may not be manifested under unfavourable conditions. But inasmuch as the genes are unaffected by these conditions, the heredity also will be unaffected, and favourable conditions will bring out the inherited characteristics in the offspring.

Lysenko completely denies this view. He claims that not the genes alone but the whole organism is responsible for heredity, which in consequence is affected by the conditions of its life. He affirms the inheritance of acquired characteristics, and claims that he can back up his statements with facts, whereas the Morgan teaching "can cite no evidence to prove its point." (p.13 of his report)

Only an expert biologist who is thoroughly familiar with the field can affirm a view on the correctness or otherwise of Lysenko's ideas, and the author of this article makes no claim to do so. It is necessary to say, however, that all the most famous biologists in Russia as well as such leading biologists as C.D. Darlington and J.B.S. Haldane have opposed Lysenko's views. Clearly his statement that his opponents "can cite no evidence" in their favour is absurd in its bombast. In any case, whatever the merits of the dispute, it is the Stalinist methods of Lysenko which are our main concern. First, however, a few words in general on his apparent value as a scientist.

LYSENKO'S "SCIENCE"

One remarkable thing is the slender experimental evidence which he cites in order to overthrow the whole structure of modern genetics. In his report he described some experiments on tomato plants which are supposed to prove his point. Eric Ashby (Harrison Professor of Botany at Manchester University, author of the Pelican book "Scientist in Russia"), who has seen these experiments, dismisses them, saying that the plants used were too small in number, of uncertain pedigree, and infected with a virus disease that would materially affect the result.

Again, replying to the Academician Zhukovsky who had said he would believe Lysenko if he saw vegetative hybrids. Lysenko referred to "dozens and hundreds" of such examples to be seen in Russia for at

least a decade. Either the good Zhukovsky must have been a blind hermit, or Lysenko was indulging in another piece of bombast.

He makes a truly remarkable claim: "Once we accept the absolutely true and generally known proposition that the reproduction cells, or the germs, of new organisms are produced by the organism, by its body, and not by the very same reproductive cell from which the given, already mature, organism arose, nothing is left of the "neat" chromosome theory of heredity." (p.15). So apparently the beliefs of most biologists, J.B.S.Haldane included, are so absurd that a "generally known proposition" will refute them! And still Morgan's genetics stand, the standard textbook in many Russian colleges until recently expounded this genetics (as Lysenko admits, p.17), and the new genetics "is not so far taught in our universities and colleges." (p.34). Indeed, bourgeois-idealist sabotage and suppression of the truth has been effective!

In one place Lysenko ventures outside the field of biology with remarkable effect. He is attacking the use of statistics in genetics (Professor Haldane's forte by the way). It arises as follows. Since the hereditary character of the organism is determined when the reproductive cells which originate it unite, the thing which determines this character is the chromosome outfit of these reproductive cells themselves. This in turn is determined by the "reduction divisions" in the parent organisms which have given rise to these cells. Now in these reduction divisions, elements of chance enter into the formation of the (single) chromosome set of the reproductive cell: its chromosomes may be drawn from either of the two sets in the parent cell, and may be further complicated by "crossing" of these chromosomes, not to speak of mutations. The results of breeding experiments therefore show a randomness: but by doing enough experiments, and applying statistical analysis to the results, valuable information may be obtained about the structure and behaviour of the chromosomes.

Lysenko fulminates against such "idealistic" methods.

"Unable to reveal the law of living Nature, the Morganists have to resort to the theory of probabilities, and, since they fail to group the concrete content of biological processes, they reduce biological science to mere statistics... Physics and chemistry have been rid of fortuities. That is why they have become exact sciences... By ridding our science of Mendelism-Morganism-Weissmanism we will expel fortuities from biological science. We must firmly remember that science is the enemy of chance."(p.48)

Let Nature take note! Chance is a Trotskyist - sorry, Morganist-deviation, and will not be tolerated in Russia.

And is it true that physics and chemistry have been rid of fortuities?

One of the most important advances in chemistry of the last quarter-century has been the growth of chemical kinetics, the study of the progress of chemical change. This branch of the science essentially studies the collision of molecules and their absorption of energy. Such phenomena are completely random as far as individual molecules are concerned, but display exact laws when the vast numbers of molecules concerned in ordinary reactions are considered. Thus we may say that after a certain time a given proportion of molecules, say $\frac{1}{3}$, have reacted, and this may be determined exactly: but for any individual molecule we can only say that it had a probability of reacting of one in three. Thus in one of its most important fields, chemistry is an entirely statistical science.

In physics the case is even more emphasised. In his little book "WHAT IS LIFE?", the physicist Schroedinger explains that all the exact physical laws are statistical, and depend for their accuracy on the vast numbers of molecules that are concerned. Lysenko can hardly have been ignorant of this, for he bitterly attacks the book in another connection. The trouble is even deeper than this, however. For study of the atom has revealed a law known as the Uncertainty Principle, according to which it is impossible to know simultaneously both the position and momentum of a body. There is a degree of uncertainty, minute indeed, but of significance when we deal with minute bodies like electrons. Max Born explains the significance of this ("ATOMIC PHYSICS", 1937): "The law of causation, according to which the course of events in an isolated system is completely determined by the state of the system at time $t = 0$, loses its validity, at any rate in the sense of classical physics." He goes on to say that further development of theory makes it possible to establish a chain of causes and effects, but in that case we do not know the initial state exactly. "In this sense the law of causation is therefore empty; physics is in the nature of the case indeterminate, and therefore the affair of statistics."

It would appear that Lysenko's ignorance of the ABC of modern physics and chemistry does not prevent him from making crass assertions about these sciences. This gives us a measure of his value as a scientist in general.

LYSENKO'S "MARXIST" PHILOSOPHY It is Lysenko's philosophy and politics that necessitate our closest attention.

He claims that his theory alone is compatible with dialectical materialism: "The materialist theory of the evolution of living nature involves recognition of the necessity of hereditary transmission of individual characteristics acquired by the organism under the conditions of its life: it is unthinkable without recognition of the inheritance of acquired characters." (p.9). And symmetrically, his opponents represent philosophical idealism.

Unfortunately he makes no attempt to argue his philosophical case, and show the necessary connection between the scientific theories and the corresponding philosophies. In fact, he grossly perverts Marx's teaching. He attempts to transplant Marx's theory of the inter-relationship of man and his environment to the world of natural science.

Marxism teaches that the conditions of man's life determine his consciousness, and at the same time his consciousness reacts back and affects his conditions of life. The materialist doctrine of the first postulate is qualified by the dialectical approach of the second. Marxism teaches that inheritance of acquired characteristics in the realm of man's mind and his life in society. Man is born heir to a social tradition, which changes as a result of changed external conditions.

This does not conflict in the least with the idea of the inheritance of bodily characteristics which are independent of environment (we should add: independent in the short run, i.e. leaving out natural selection.) Thus a man may have a liking for music and an appreciation of its value, as a result of being born into a family where such things are esteemed. But he will not have a gift for musical composition or execution unless he has the right gene structure, for a musical gift is apparently a physical, hereditary characteristic.

Lysenko's conception of a "materialist" genetical theory and its alleged accordance with Marxist ideas is in actuality a vulgarisation of Marx's whole method.

The value of Marx's teaching lies in its correspondence with the facts.. For that reason bourgeois historians, where they are genuinely concerned with truth, are compelled to adopt the essence of Marx's analytical method. Of course, they reject the positive world-changing side of Marxism. But we must emphasise that the latter would have no significance if it were not for the objective truth of the theory.

Similarly, the test of a natural-scientific theory is in its agreement or otherwise with the facts. Moreover, natural science is more fortunate than historical in that its facts can be established at will by experiment. If the Morgan theory fits the facts then it is correct, at least unless new contradictory facts are discovered. This is true irrespective of whether or not its proponents are idealists: the theory itself stands the materialist test.

Lysenko's error - if we can call it that - lies in trying to erect scientific theories to fit an a priori philosophical conception. In so doing his philosophy is in reality idealist - for all that he calls it "materialism" - for the laws are deduced from his mind and Nature bidden to fit them. Engels had a fitting reply to Duhring who attempted a similar thing:

"If we deduce the world schematism not from our minds, but only through our minds from the real world, deducing the basic principles of being from what is, we need no philosophy for this purpose, but positive knowledge of the world and what happens in it: and what this yields is also not philosophy, but positive science."

Lysenko's method is not merely idealist, but obscurantist. The mediaeval Schoolmen obtained their natural science by studying the Bible and the works of Aristotle. Any individual such as Roger Bacon or Copernicus who studied nature and obtained results contradicting these authorities, was pursued and forbidden to publish his works. In Russia today, scientists who dare to obtain results contradicting the Stalinist "interpretations" of Marx and Engels are liable to be expelled and imprisoned.

"THE CLASS STRUGGLE IN GENETICS" As well as denouncing their theories, Lysenko attacks his opponents as idealists, bourgeois reactionaries and foreigners. The genetics dispute is a facet of the class struggle. "Two worlds - two ideologies in biology" is the sub-title of one of his chapters.

It is a fact, of course, that the majority of the world's scientists come from capitalist countries. Many are reactionary, many hold idealist and mystical views. Up until now, no-one has thought of attacking their work on these grounds. The objective merit of their work is the criterion, among Marxists as among all other people with a scientific outlook. Where such views do affect the work - as in the social sciences, where the results depend on selection of significant facts, and the conception of "significance" varies with the investigator's bias - the case is of course different. It is notorious that, despite their false views on philosophy, the greatest scientists of our day were bourgeois in outlook. Thus, Newton firmly believed in God; yet his mechanics, by enlarging man's understanding of the universe, has materially helped to undermine religion. If Lysenko had been alive perhaps he would have denounced Newton's work as the product of an idealist?

Even in the social sciences a scrupulous worker has been known to produce results detrimental to the interests of his own class. The economist Ricardo was one of the most capable and conscious spokesmen of the English capitalist class. How did Marx assess him? Speaking of the bourgeois theory that when workers are displaced by machinery there is always a corresponding liberation of capital to employ them again, he says:

"Originally Ricardo held the same opinion; but after a time, with the scientific impartiality and love of truth characteristic of the man, he expressly renounced it."

(CAPITAL, Vol I, Chapter 13, Sec.6
footnote)

Nor should we forget that Marx drew largely on the work of the bourgeois Ricardo when he wrote "CAPITAL."

Scientific objectivity is a priceless heritage, gained by capitalism from the obscurantism of the Middle Ages, and except in fascist countries capitalism has not destroyed it. Socialists must recognise and welcome this fact, not deny it and bury it under a dung-heap of slander.

The truly reactionary nature of Lysenko's attitude appears when he attacks his opponents as bourgeois or friends of foreigners. Thus, he talks of "foreign reactionary biology hostile to us." (page 21). "PRAVDA" (11.9.48) pointed out that Weissmann was a German, Morgan an American, and Mendel an Austrian and a monk to boot! The choicest flower in this appalling attitude is to be found in a statement quoted in the Russian paper "LITERATURNAYA GAZETA" (8.9.48):

"We the undersigned, members of the collective farm 'The Road to Socialism' (Ramensk Region, Moscow Province) demand that the hangers-on of bourgeois science, vile lackeys of the foreigners, should be expelled from our universities. They have no place among the scientists of our Fatherland. What have they given to the people who are advancing with sure tread to Communism?"

Against these reactionary foreigners, "PRAVDA" and Lysenko hold aloft the banner of "Marxism". Marx, of course, was a Russian born and bred!

USEFULNESS AS A SCIENTIFIC CRITERION

According to Lysenko, his opponents' work does not lead to results of practical usefulness, and apparently that is enough to condemn them. Thus he attacks Zhebrak's institution for studying polyploidy, because "although it has for some years done nothing besides its work on polyploidy, (it) has produced literally nothing of practical value." (page 23). The paper "BOLSHEVIK" (15.8,48) delivers itself of the general statement: "A science which does not help production, which does not arm practical workers, which does not help Soviet citizens to build a better life, has no right to call itself science."

"The test of theory is practice." That is Marxist teaching, and in the natural sciences it means experimental observations are decisive, a familiar and generally accepted principle. But it bears no immediate relation to the criterion of usefulness. It is well known that "pure" science is seldom of any immediate practical value; but were it suppressed for that reason, information of great ultimate usefulness would be lost. Only in technology can the criterion of usefulness be applied. And technology itself would be meagre were it not for the "pure" science on which it is based, which often has been conducted in a spirit of pure inquisitiveness.

Of course, the development of science is dependent on the needs of society. The one interacts upon the other. It would be entirely reactionary to say that the scientist can sit in an ivory tower, indifferent to the society in which he lives. In the last analysis, all science serves the needs of society and in that sense there is no "pure" science.

Once again, Lysenko's idea is a perversion of Marxism, which can only serve to discredit Marxism among serious people.

Is it in fact true that Mendel-Morgan genetics are useless? Let us repeat, even if they were it would not condemn them if they correspond to the facts. But a geneticist of L.Fyfe, writing in the Stalinist "MODERN QUARTERLY", Autumn 1947, had the following to say:

"In my own view this (Lysenko's influence) must have caused serious losses to the USSR. In North America plant breeding avowedly based on genetics has two successes to its credit - hybrid corn and rust-resistant wheat - which are so striking that it has been seriously argued that they did more than any other discovery or invention towards winning the war. Plant breeding in the USSR cannot claim successes of this magnitude."

What, then, is Lysenko's practical value? It appears that he is a very capable practical farmer, and has been responsible for many ideas which have helped to improve Russian farming, though they do not depend at all on his genetical theories. Professor Ashby says that "when the much-advertised pre-treatment of grain by low temperatures, called vernalisation, proved a great failure, Lysenko cleverly substituted another pre-treatment, which is virtually a germination test, but which appeared under his name in the decrees for the spring sowing in 1945 and 1946."

("SCIENTIST IN RUSSIA" page 115)

THE PARTY AND THE PURGE

If Lysenko's ideas and activities are so monstrous, how has he succeeded in rising to the top in the

Russian genetical sphere? The answer is simple: behind Lysenko and his theories stands the Russian Communist Party; behind that stands the NKVD.

"The question is asked in one of the notes handed to me. What is the attitude of the Central Committee of the Party to my report? I answer: the Central Committee of the Party examined my report and approved it", says Lysenko. Thus far the English version. "PRAVDA" 10.8.48 remarks that this was greeted with frantic applause and interminable ovations, all rose and swore fidelity to the great cause of Lenin-Stalin.

"The condition in the Academy has now sharply changed thanks to the interest taken in it by the Party, the Government, and

Comrade Stalin personally. A considerable number of Michurinists have been elected members and corresponding members of our Academy, and more will be added shortly, at the coming elections." (Page 22 of Lysenko's report)

Prescience!

That well-known geneticist, Molotov, quoted in "WORLD NEWS AND VIEWS" (6.11.48) approves the inheritance of acquired characteristics, remarks that "the scientific discussion on biological questions was conducted under the guiding influence of our Party." And the Party never jokes.

Already in the 1930's a small-scale purge had occurred. Academicians Levitsky and Ardylov were imprisoned. Professors Agel and Ferry were shot. Lysenko's greatest opponent, Vavilov, who in 1921 was entrusted by Lenin with the task of organising Russian agricultural research, and who won world fame as a biologist, was sent to a concentration camp in 1940, where he died in 1942. But still has ideas held the field.

All this has changed. The Council of the Academy of Sciences of the USSR issued a decree on August 28th, 1948. Orboly, secretary of its biological section, is dismissed. Schmalhausen, Director of the Institute of Morphology, is dismissed. The Laboratory of Cytology (study of animal and plant cells) is abolished. The "Five Year Plan" of the Biological section is revised along Michurin lines. The Council also sent a letter to Stalin, admitting its past errors and promising to occupy a "leading position in the struggle against reactionary teachings."

In 1945 Professor Zhebrak wrote to the American magazine "SCIENCE" defending the freedom of Soviet science, pointing out that many Soviet geneticists were sharply critical of Lysenko's theories. After two years "PRAVDA" wakes up and thunders: "Zhebrak as a Soviet scientist should have unmasked the class meaning of the struggle which is taking place around questions of genetics. But blinded by bourgeois prejudices, by detestable fawning on bourgeois science, he has adopted the attitude of the enemy's camp..." (Quoted from "TIME", 22.9.47)

Until recently, Stalinists abroad could maintain a critical attitude towards Lysenko. Thus did Fyfe, in the "MODERN QUARTERLY" article quoted (it is interesting that in that article he referred to Zhebrak's "SCIENCE" article as proof of the freedom of Soviet science! Little knowing he was in the "enemy's camp"...) So too has

J.B.S.Haldane. But the British C.P. is reacting to this new orthodoxy by publishing glowing reviews of Lysenko's report. Stung by A.J.Cummings' taunts, Haldane has written an article in the "DAILY WORKER" (1.11.48) criticising some of Lysenko's genetical ideas - but oh, so tactfully! - not a word about his attacks on statistics, on foreigners, not a word about the philosophical question or the purges. No matter: Haldane is on the spot and cannot escape from the dilemma of his position. Let him ponder on the example of Tito: people have been excommunicated for lesser heresies than Haldane's.

WHAT DOES IT ALL MEAN?

Why, we may ask, does the Stalinist Government take so much interest in this question.

The reasons are probably manifold. Lysenko is the practical man, the peasants' demagogue", as Ashby says. He is supported as the man who rouses the peasants from their sloth; whose practical genius can force the raising of agricultural production. If this be at the cost of destroying the edifice of Russian genetics, that must be borne.

Again, the Stalinists are whipping up hostility to the West, not only against capitalism, but against all liberal ideas that might encourage a critical spirit and threaten the Stalinist totalitarian regime. Is it an accident that Western biologists are attacked not only as reactionaries but as foreigners?

Under Stalinism, objective research into history and economics is already impossible. All books dealing with the history of Russia must paint Trotsky, Bukharin, Zinoviev and many others as saboteurs of the revolution: anyone who dared mention their leading role in

the revolution and the early Soviet state would not spend a day free. Nor would an economist who submitted a statistical analysis of the distribution of the national income between groups and classes in Russia, unless he carefully obscured the true position. Now biology joins the list of "controlled" subjects. Nature must conform to the Party's dictates: if it happens that she fails to, no-one must dare to mention the fact.

A regime which does this demonstrates its absolutely reactionary character. No government which fears and suppresses science can stand the test of history. Economic successes may be achieved by applying known techniques; technology may even make some advances. But when the free development of science is stopped, the source of progress dries up.

Socialism, by liberating man from his class exploitation, frees his spirit for the pursuit of truth and beauty. Such was the effect of the Russian revolution, although it was only a first step to socialism. By its suppression of the human spirit, together with its infernal exploitation of the body, Stalinism demonstrates how far it is from socialism, and how it undoes the work of October, 1917.

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