

## Dangerous Occupation

*Zhores Medvedev*

*In part one of Dangerous Occupation (see Spokesman 111), Dr Medvedev described how, in 1943, aged 17 years, he was called up to fight in defence of the Soviet Union, served at the front, and was wounded. Following recuperation, he commenced to build what became a very long and distinguished scientific career. Here, in part two, he describes some momentous events of those early years.*

At the end of 1945 the latest microscopic equipment and laboratory implements were brought to our academy from Germany. I became familiar with working on the microtome and learned to paint microscopic sections of the growing points of plants to make micrographs. As early as 1939, research had been published in Germany, showing that in the unicellular algae *Chlorella*, male and female cells contained different compositions of carotenoid pigments. These pigments are nearly always present in the pistils and stigmas of plants' flowers. Zhukovsky instructed me to gather all the literature I could on this subject in English. He was fluent in French and German, but not English. I translated a large number of publications for him and at the start of 1948 he prepared a review under both our names, 'The role of light and carotenoids in development of asexual and sexual generations in plants'. This was soon published in the journal, *The Advances of Contemporary Biology*<sup>1</sup>.

In the spring of that same year, Zhukovsky suggested that I go on a trip to the State Nikitsky Botanical Garden in the Crimea to carry out an experimental study of carotenoid pigment composition in male and female plants organs. (The name derived from the small village of Nikita on the slope above the area chosen by the botanists). I needed to pass my fourth year tests and examinations ahead of schedule in order to get to the Crimea as early as possible. The majority of plants bloom in spring. According to Zhukovsky's theory, some metabolites of carotenoids could play the role of plant hormones. (In plants there is a wider variety of forms of sexual

reproduction than there is in animals and the hormonal regulation of these processes has been well studied). I had to learn the process of separating plant pigments by paper and column chromatography. I also had to study the composition of these pigments in the reproductive organs of some plant species with large stamens and bright yellow pistils.

The Nikitsky Botanical Garden's biochemistry laboratory, located not far from Yalta, had excellent equipment, brought from Germany under the terms of reparation payments, and an extensive range of chemicals. The head of the laboratory, Professor Vasily Ivanovich Nilov, was a friend of Zhukovsky. The Nikitsky Botanical Garden, founded as the 'Imperial Botanical Garden' in the early 19<sup>th</sup> century, held a rich collection of southern and sub-tropical plants. I came here in the middle of April and quickly got down to work. However, water was the main problem for the whole of the Crimean coast. During the German occupation from 1941 to 44, all the forests on the mountain slopes were cut down. This measure was carried out to combat partisan forces. Some divisions of the Red Army, who had been cut off by the rapid German offensive in the summer of 1941, remained hidden in the forests and for a considerable number of months participated in the defence of Sevastopol. Ammunition and food rations were dropped to them from aeroplanes. In the absence of forests on the mountain slopes, rainwater did not supply the springs, which in the past provided Yalta's tap water, and washed away the soil into the sea. Every time it rained, the sea became brown for two to three kilometres. The Nikitsky Botanical Garden, whose rare plants needed watering, also suffered badly. Drinking water was brought by sea in tankers to the residents of Yalta and the entire coast. On a hill next to the Garden was a guarded German prisoner of war camp, containing around two hundred soldiers. They were working on building flat terraces on the slopes and drainage facilities, so as to reduce soil erosion into the sea and to save water for irrigation. There were still reminders of the war nearby. On the 'Pushkin' seaside path to Gurzuf, not far from the Garden, stood a small monument with the inscription: 'On this site on 17-18<sup>th</sup> December 1942 more than five thousand Soviet citizens – residents of Yalta – were shot by the German occupiers'. I understood that they were Jews of Yalta: men, women and children.

My work was absorbing. I swam in the sea every morning. I lived in a separate room in the house of visiting scientists. I even received a small wage, in addition to my student scholarship and the pension I still retained as a disabled war veteran, even though I was already able to run. There was a government directive to pay pensions to student war veterans, regardless

of their state of health. This idyll was violated on 1<sup>st</sup> August, when in the pages of *Pravda*, and all the other national newspapers, an extensive report was published 'On the Situation in Biological Science' by academician T.D. Lysenko. The report was made at a special session of the Lenin All-Union Academy of Agricultural Sciences (LAAAS), which had opened on 31<sup>st</sup> July.

### **The August coup**

There is no need to expound the content of Lysenko's report here. There had been no precedents in the history of the USSR, whereby scientific reports of academics of any rank were published in such a format and simultaneously in all the national newspapers. This was only possible for reports or directives given at plenary meetings or congresses of the Communist Party. This meant that Lysenko's report was a directive, approved by the Politburo and by Stalin personally, whilst the paper's recommendations would immediately take root in all political and administrative matters. The main points of Lysenko's report, meanwhile, displayed the most primitive pseudo-science, which regressed biology and all disciplines related to it by 150 years – back to Lamarck's theories on the inheritance of acquired characteristics. Several key disciplines were immediately rejected or prohibited as reactionary, bourgeois and idealistic; above all genetics and the chromosomal theory of heredity, the theory of genes, mutations and many others. Medical genetics was prohibited as a reactionary science. The Austrian monk, Mendel, had simply been mistaken in the formulation of his 'pea laws', Weismann with his theory on germ plasma was a reactionary idealist, whilst Morgan's chromosomal theory of heredity served the interests of American racists.

In the debates about Lysenko's paper, Zhukovsky made the harshest criticism, wholly defending the chromosomal theory of heredity using vivid examples (including, amongst others, the consistency of the number of chromosomes in every species, chromosome reduction division through the formation of gametes, and the link between mutations and the changes in chromosomes). But at the final meeting of the session on 6<sup>th</sup> August, after Lysenko had informed the participants that his report had been approved by the Central Committee of the Communist Party, Zhukovsky returned to the podium and announced that he had realised his mistakes and errors, and would henceforth work for the development of 'Michurinian biology'. Two other scientists, who in the past had criticised Lysenko, also publicly 'repented'.

The August session of the Lenin All-Union Academy of Agricultural

Sciences reminded me of the February-March plenum of the Central Committee of the Communist Party, whose decisions started the terror of 1937-38. The repressions brought to the USSR massive political and economic damage and deprived the country of its most able people, including military leaders and scientists. But this terror made Stalin an absolute dictator. The 'August session' made Lysenko a dictator of biological and agricultural science. For the entire country this revolution was a catastrophe. It severely weakened the credibility and position of Stalin as a world leader. Within the Soviet leadership there was obviously some form of political struggle, the target of which was Andrei Zhdanov, Secretary of the Central Committee and chief ideologist, second after Stalin in the Party ranks. In the Politburo, Zhdanov used to support critics of Lysenko. Yuri Zhdanov, the son of Andrei Zhdanov and husband of Stalin's daughter, Svetlana, was the head of the science department in the Central Committee of the Communist Party. In March 1948, Yuri Zhdanov gave a presentation at a propagandist meeting, having described Lysenko's ideas as pseudo-scientific. The newspaper *Pravda* now printed a letter from Yuri Zhdanov to Stalin, in which he admitted his mistakes. The repentance of Zhukovsky and Yuri Zhdanov was part of a script. They were 'allowed' to repent and this meant they would not be targeted in the ensuing pogrom. I was aware that the scientific revolution could not be implemented without some roots in the Party and state leadership. It was obvious that massive repressions were to be expected, not just amongst biologists. But I was still unable to understand the whole picture of the near future. Many years later, I found out that Andrei Zhdanov, the former Leningrad Party leader, did not give his consent for the arrest of the academician, Nikolai Ivanovich Vavilov, the director of VIR (the All-Union Institute of Horticulture), which had been prepared as far back as 1937. Zhdanov treated Vavilov with great respect. The arrest was therefore carried out in August 1940, during Vavilov's expedition to western Ukraine. The 'decision for arrest' was found in an archive, signed by Senior Lieutenant of State Security Razny. Judging by its style and content, this was obviously only a draft, prepared at the end of 1937, dated 5<sup>th</sup> August. It was ratified by Lavrenty Beria on 6<sup>th</sup> August 1940. The approval of the public prosecutor was dated 7<sup>th</sup> August<sup>2</sup>. Vavilov was arrested in a field near Czernowitz in the Lviv oblast. A special group arrived from Moscow for the arrest. Their aeroplane was only able to land in Kiev. It is perfectly obvious that the arrest of Vavilov was carried out on the basis of verbal instructions given on the 3<sup>rd</sup> or 4<sup>th</sup> August, whilst all the written documents were signed after telephone messages from the special

group. The arrest of Vavilov only became known in Leningrad a few days later through members returning from the expedition. At the beginning of the blockade of Leningrad, towards the end of 1941 and early in 1942, Zhdanov made many decisions independently, without checking them with Stalin.

On 10<sup>th</sup> or 11<sup>th</sup> August, Petr Mikhailovich Zhukovsky unexpectedly arrived at the Nikitsky Botanical Garden. He needed a rest. The Nikitsky Garden held institutional status within the Lenin All-Union Academy of Agricultural Sciences. Zhukovsky, as the only botanist-academician, represented the garden's scientific interests and reviewed its reports and programmes. In the same house as visiting scholars he was allocated the best room with a veranda and a view overlooking the sea. He hugged me. There were tears in his eyes. 'I have made peace with Lysenko ... Damn world ... I did it for the sake of my students!'

### **The transformed academy**

When I returned to Moscow at the end of September, the Timiryazev Academy was very different. Professor Vasily Nemchinov, the Rector of the Academy and an important agrarian economist, had been dismissed. V.N. Stoletov, candidate of biological sciences and long-time colleague of Lysenko, became the new Rector. The head of the department of genetics and plant selection, A.R. Zhebrak, had been removed and Lysenko himself took the chair. He would now lecture a course on 'Michurinian genetics', primarily to fifth year students who were taught 'Morganism-Mendelism', the wrong science. ('Michurin Biology' was named after Ivan Michurin, a self-educated fruit plant selectionist who died in 1935). Two deans and many other teachers were dismissed. The lecturer, A.I. Atabekova, was sacked from the department of botany. Zhukovsky retained his post, but a 'postgraduate', discharged from one of the special military forces, was sent to him without his consent. Zhukovsky immediately understood that he was an informer for the Ministry of State Security (MGB) and changed the topic of conversation whenever this 'postgraduate' entered the laboratory. Zhukovsky gave the new postgraduate a 'Michurinian' project. He was to study the possibility of transferring immunity from one plant to others by means of vegetative hybridization. (He worked very hard on this and made hundreds of grafts, but achieved no success). The new principal, Stoletov, carried out the order to change the topics of postgraduate research. My friend, Vasya Zemskii, another disabled war veteran with a prosthetic arm, having started on the topic of growth hormones in the department of plant physiology, received a new topic on the physiology of 'branched wheat', a

semi-wild species with a low percentage of proteins. With the help of 'branched wheat', Lysenko promised to double the yield (in peculiar conditions and with a very sparse number of crops, this wheat's ears branched out and turned into a bunch, making an impression on people unfamiliar with the botany of wheat).

Under these new circumstances I had few chances to get a postgraduate position and receive a doctorate. Students who had finished their courses went through the so-called 'distribution lists' of vacancies on collective and state farms. Free job placements for qualified specialists were not practised. The warrant for staying in post-graduate study required special characteristics and recommendations. I could not work on 'Michurinian' topics. Another plan occurred to me. First and foremost I had decided to extend the length of my undergraduate education by a year and finish, not in 1949, but 1950. To do this I transferred from the faculty of agronomy to the faculty of agro-chemistry and soil science. The dean, N.A. Maisuryan, retaining his post at the cost of repentance and the promise to take up a 'Michurinian' position, helped me on this occasion. In the new faculty I was to learn several new disciplines as an agro-chemist and was therefore able to repeat the fourth year. I now had two years of study ahead of me, not one. In these years it would be possible not only to prepare my undergraduate thesis, but to also write a dissertation to gain an academic degree as a candidate of biological sciences and pass the doctoral examinations. I already had two publications in scientific journals and three essays on the carotenoids of plants turned up in print in the papers of the Soviet Academy of Sciences (they were published in 1949).

My room-mates in the faculty of agro-chemistry and soil science's new halls of residence were my old friends Kolya Panov and Boris Pleshkov, both disabled war veterans. Panov was wounded in the leg in Stalingrad. Boris Pleshkov, who entered the academy in 1945, suffered shell-shock following an explosion in Czechoslovakia. Four female students lived in the adjacent room. One of these was Rita Buzina, my future wife.

Meanwhile, the country's political situation grew darker every month. Andrei Zhdanov died from a heart attack at the end of August. Georgy Malenkov, a conservative, anti-Semite and protector of Lysenko, became the Communist Party's chief ideologist. Persecutions started against Vyacheslav Molotov, second in the government to Stalin. In January 1949, Molotov's wife, Polina Zhemchuzhina, was arrested on the charge of Zionism (she was Jewish). Stalin's 'successor' was now Malenkov, whose alliance and friendship with Lavrentii Beria did not bode well. Nikolai Voznesensky, a young member of the Politburo, able economic planner

and Stalin's First Deputy Premier in the government, all of a sudden mysteriously 'vanished' without any explanation (on 1<sup>st</sup> May 1949 his portrait did not appear amongst those of the other Politburo members which were displayed in the centre of Moscow). As it turned out later, he was arrested early in 1949 during the 'Leningrad Affair', which was known of only in Leningrad, and secretly executed together with his brother and the Leningrad Party leaders (amongst others, these included Chairman of the Council of Ministers of the RSFSR, M.I. Rodionov, Secretary of the Central Committee of the Communist Party, A.A. Kuznetsov, and Secretary of the Leningrad Regional Committee, P. Popkov. Around two thousand people were arrested in Leningrad).

The death penalty was abolished in the USSR in 1947 to honour the 30<sup>th</sup> anniversary of the October Revolution. On 12<sup>th</sup> January 1950, the reinstatement of the death penalty took place (with regard to national traitors, spies and saboteurs). There were even arrests in the Leningrad University, where at the time my brother, Roy, was studying in the faculty of philosophy. I learned of the events in Leningrad from him and I was very worried about his fate. My father's sister, Tosya, who survived the blockade of Leningrad, also lived in the city. Important officials in the government of the RSFSR in Moscow were also arrested in connection with the 'Leningrad Affair'. Trials were closed and sentences were carried out immediately. Those executed were cremated and buried secretly. The terror had begun, but went on in secret, without open trials or charges. The reason for this new terror seemed obvious to me, but I did not share my assumptions with anybody. During a long, ceremonial conference in the Bolshoi Theatre on the occasion of his 70<sup>th</sup> birthday, on 21<sup>st</sup> December 1949, Stalin looked ill. He was also immobile and did not utter a single word. He could not rise from his seat and go up to the microphone. But Stalin prepared successors to replace him who would not make revelations about his crimes and the terror of the past. For this the hands of possible successors were already stained with fresh blood.

### **Ph.D. degree by surprise**

I stayed in Moscow for my summer practical in 1949. It was possible to conduct experiments at the faculty of agro-chemistry and biochemistry, which was also located in block 17, in the old section of the building. In the cellar of that same building, in 1944, I had purified sand with hydrochloric acid for employees of the faculty of agro-chemistry, who were setting experiments in the vegetation house behind the block. At that time the academician, V.N. Pryanishnikov, was still alive. A student of

K.A. Timiryazev and teacher of N.I. Vavilov, he was the most renowned scientist in the academy, and the founder of Soviet agro-chemistry. He held the title 'Hero of Socialist Labour' and many other decorations. His persistence in establishing a few plants for the production of chemical fertilisers in the USSR, especially ammonium and potassium nitrates, was valued during the war. These plants were quickly re-equipped for the production of gunpowder and explosives. Pryanishnikov died in spring 1948 at the age of 83. 'Organisational measures' in 1948 did not affect professors in the department, although Pryanishnikov was a known opponent of Lysenko. The reasons for their 'untouchability' I soon understood. In one of the department of agro-chemistry's laboratories – which had a separate entrance from the outside and was regarded as 'secret' (the effect of radiation on plants was studied here) – Nina Teimurazovna Beria, candidate of agricultural sciences and wife of Lavrentii Pavlovich Beria, had been working for almost five years. She was a student of Pryanishnikov. A chauffeur-driven 'Pobeda' [official car] usually brought her to the laboratory entrance. She was listed in the staff under her maiden name, Gegechkori. She did not come to the departmental seminars or faculty conferences. (I met her by chance, in 1952, in the office of the head of the department, Professor A.G. Shestakov).

In a small botanical garden in the department of botany I started experiments to study the biochemical differences of male and female hemp plants (*Cannabis sativa*). It is a bi-sexual plant. I tried to determine by biochemical and physicochemical methods whether there existed in this case any dimorphism of pollen and whether it was possible to determine which pollen grains are 'male' and which are 'female'. In some bi-sexual plants male and female pollen grains vary in size. In hemp they had the same proportions. However, upon viewing the colour measurements on the pH scale, subject to small changes of acidity, I was able to detect dimorphism of hemp pollen<sup>3</sup>.

In spring 1949 I started preparing my dissertation. I worked mainly in the academy's library, but quite often I went to work in the state public library (in the name of V.I. Lenin), which had a wider choice of journals on biochemistry and physiology. The work was completed towards the end of February 1950. The title of the dissertation – 'The physiological nature of the formation of sexual characteristics in plants' – gave scope for theoretical generalisations. The final chapter of the dissertation, on the experiments with hemp in 1949, could have even served as an undergraduate thesis. Dissertations were usually 200-250 pages in length at that time, undergraduate theses 40-50 pages. Nobody, not even



Zhukovsky, knew about my plans. There had been no cases of students presenting dissertations in the history of the academy. Maybe there hadn't been any in the whole of Moscow. I understood that the new rector could object to it. Zhores Medvedev, as a student of Zhukovsky, had a reputation as an opponent of Lysenko. In any case, he was obviously not a 'Michurinist'. It was necessary to present everyone with a *fait accompli*. The work is done, presented – now decide. It's like in sport: an athlete suddenly jumps over a higher bar, even if only once, and you do not take it away. I paid for my dissertation to be reprinted using a typewriter and on good paper. There were 260 pages altogether. At the same time, I was preparing to take the *kandidatskii minimum* exams, before the defence of my thesis, on the subjects of Marxism-Leninism, English language and plant physiology. I had already decided to present my dissertation for defence not to the faculty's scientific council, but to the Institute of Plant Physiology at the Academy of Sciences of the USSR. The director of this institute, the academician, Nikolai Aleksandrovich Maksimov, was also the head of the department of physiology at Timiriachev Academy, and knew me well. He was a friend of Zhukovsky and, indeed, it was he who submitted our articles to the Academy of Sciences of the USSR. He had a long-running dispute with Lysenko over priority in formulating the theory of stages of plant development. Maksimov had published his version of the theory two years earlier, in 1927, but in the *Works of the All-Union Institute of Horticulture*. At the time he worked at this institute, together with N.I Vavilov. Lysenko published his version of the theory in the newspaper *Pravda*.

The democratic procedure of open public defences of dissertations within academic councils and scientific institutes was inherited in the Soviet Union from the traditions of imperial Russia. In other countries the awarding of academic degrees takes place differently, in a narrow circle of a few experts where the professor, under whose direction the work has been carried out, plays the main role. The 'Russian' variant allowed the Institute of Plant Physiology at the Soviet Academy of Sciences to independently nominate opponents of dissertations and award doctoral degrees by a secret ballot of thirteen members from its academic council. My supervisor was able to attend, but could not take part in the vote. The result of the vote was the final decision. In 1950 there was no requirement for institutions to receive approval of their decisions on candidates' theses from the Ministry of Higher Education – only doctoral dissertations were received for examination by the Higher Attestation Commission. I knew well at that time the opponents of the whole school of P.M. Zhukovsky.

These were V.V. Wil'yams, the dean of the faculty of agro-chemistry, and V.N. Stoletov. The school of academician V.R. Wil'yams, who died in 1939 (V.V. Wil'yams was his son), was in irreconcilable conflict with the school of academician Pryanishnikov for almost thirty years. It was a conflict of principle over the ways of developing Soviet agriculture. Pryanishnikov reckoned that it was necessary to take the European route and expand production and use of mineral fertilisers. V.P. Wil'yams was opposed to mineral fertilisers, claiming they destroyed the soil structure, and instead advocated the *travopolnaya* [grassland] system of horticulture and the transformation of the steppes by creating protective forest belts. In 1948, on a wave of victories for 'Michurinian biology', the *travopolnaya* system was recognised as the only correct one. Stalin's plan was adopted for the transformation of nature, and state forest belts were created across the whole south of the USSR.

At the beginning of 1950, V.N. Stoletov was no longer the principal of the Timiriazev Academy. He was appointed Deputy Minister of Agriculture and, shortly afterwards, as Minister for Soviet Higher Education. He now shifted all education in the country to the Michurinian position.

In March 1950, I defended my thesis and passed the state exams on Marxism and English language. On March 10<sup>th</sup>, on the decision of State Examination Commission, I was awarded the qualification of 'Scientific Agronomist', specialising in agro-chemistry and soil science. But the real diplomas were only issued after obtaining a place of work. Lists of vacancies were posted in the dean's office. At the end of March, I brought the original manuscript of my dissertation to P.M. Zhukovsky. It surprised him, but he was overjoyed. He was obviously concerned about my fate. Within a few days he had read through the manuscript and had not changed anything. He signed the submission for defence at the Institute of Plant Physiology and I took three copies to the secretary of the Institute, which was located in the south of Moscow. My work was accepted and placed in a queue. I was promised to be able to defend my Ph.D thesis in the autumn, but my turn only came on 1<sup>st</sup> December 1950. On that day a public defence with a secret ballot took place. The decision 'to award' was unanimous. The following day I received an excerpt from the examination report: 'By the decision of the Council of the Institute of Plant Physiology in the name of K.A. Timiryazev on 1<sup>st</sup> December 1950, the degree of Candidate of Biological Sciences is awarded to Zhores Aleksandrovich Medvedev'.

### Afterword

In 1990, forty years after this defence, 'I have visited again. That corner of the earth' (it is from Pushkin). The street where block 17 stood, old and

new, was now 'Pryanishnikov Street'. In the square before block 17 stood, in all its glory, a bronze statue of D.N. Pryanishnikov. Next to this was a memorial plate in memory of Professor P.M. Zhukovsky, who died in 1975 at the age of 87. In the square near the main academy building stood a bronze statue of V.R. Wil'yams. On the wall of the main block another, bigger memorial board appeared: 'Nikolai Ivanovich Vavilov, the great Soviet scientist, studied here from 1908 to 1911'. My friend Boris Pleshkov, who became a professor and dean of the faculty of agro-chemistry in 1965, died a few years later. He was replaced as dean in 1972 by Nikolai Panov, also a professor and academician of the Lenin All-Union Academy of Agricultural Sciences. In 1990 he was in good health. We hugged one another and the memories started. His secretary soon brought us caviar sandwiches and a bottle of vodka. Tea was not enough to celebrate such a meeting.

*Translated by Andrew Ramsbottom,  
with additional editing by Sarah O'Malley.*

### **Literature**

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3. Medvedev, Z. (1949), 'Physico-chemical dimorphism of pollen in bi-sexual plants', *Doklady Akademii Nauk SSSR*, Vol. 68, No. 4, pp. 777-780.