

The years of S I Vavilov's presidency (1945–1950) saw the structural transformation of several academic institutions, the rehabilitation of observatories and laboratories ravaged during the war, and the establishment of new institutes, including the Institute for History of the Natural Sciences and Technology, which now bears the name of S I Vavilov.

All aspects of S I Vavilov's activity as an Academy President are hard to cover in the context of this presentation.

I cannot help mentioning the following, probably little known, fact. In 1946, on the initiative of S I Vavilov, the traditional annual meetings of the Academy of Sciences (on the 2nd of February) were resumed in the form which still persists now. Since then, the annual sessions of the General Meeting have commenced with the opening speech of the Academy President which gives a brief review of the scientific accomplishments over the year elapsed.

During the post-war period, S I Vavilov devoted considerable effort to the resumption and development of the international scientific relations of the Academy of Sciences. This was vital to emerge from the international isolation in which the Academy had found itself during the pre-war and war-time years.

S I Vavilov was well known abroad. He was elected an honorary member of several foreign academies of sciences.

All these facts demonstrate how much larger and stronger the Academy became under the supervision of Sergei Ivanovich. And he was its President for only five and a half years!

His many-sided scientific and administrative work in the Academy of Sciences was combined with active participation in the public life of our country.

However, it is invalid to say that the advancement of science in the country and the Academy life were void of conflicts and contradictions during S I Vavilov's presidency. The aggravation of ideological war after the onset of the cold war had an extremely negative effect on the development of several branches of science, first and foremost biology. Before long, the ideological campaign embraced other branches, too: physiology, cybernetics, and economics. There followed administrative measures. Several scientific institutions and scientific journals were either closed or reorganized. Similar events were about to occur in physics.

In view of the circumstances, S I Vavilov had to withstand the intrusion of ideological dictate into the realm of scientific activity and to display enormous self-restraint to eliminate the destructive consequences of this intrusion. An amazing willpower, his prestige, and of course a deep knowledge of philosophy and specific sciences allowed him to avert, with support from other leading scientists, a terrible disaster, and thereby save the physical sciences from a pogrom similar to that which biology had been subjected to. And not only the physical sciences.

All that S I Vavilov did for science, the Academy of Sciences, the country, and all his enormous scientific, enlightening, administrative, public, and state activities can be termed in no other way than a heroic feat. This feat could only be accomplished by an encyclopedist, a personality of high cultural and moral standards, a person to whom the interests of his native land came first.

Those who knew Sergei Ivanovich would speak of the fascination of this man, of his tactfulness, responsiveness, and diligence.

The great labor, the arrest and decease of his brother, and the death of his nephew had a grave effect on his health. He

suffered from several heart attacks and died of myocardium infarct on the night of 25 January 1951, precisely half a century ago. Sergei Ivanovich was buried in the Novodevich'e cemetery in Moscow.

I never had the honor to personally witness Vavilov's activity, so to say, 'in real time'. In the preparation for this meeting, I looked through many articles and collected memoirs of Sergei Ivanovich's disciples and comrades, and several of his articles and books. Most striking is the great scale of this man's personality, who did so much for our country and our Academy.

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About Sergei Ivanovich Vavilov

V L Ginzburg

My speech is nothing more than several remarks, and rather odd ones at that. I only hope that these remarks will be not without interest and to some extent complement the in-depth analysis inherent in E L Feinberg's articles [1] and his speech to this audience.

Sergei Ivanovich Vavilov was the Director of FIAN from its inception in 1932 up to his decease in 1951. As for me, I have been working at this institute since 1940, but in actuality I have been related to FIAN for a longer time (approximately since 1938). The institute was small at that time (about 200 staff members), and the Director's activity was generally transparent to all staff members. Furthermore, some issues I was concerned with interested Sergei Ivanovich, though I recall only one scientific discussion with him. One day, which was before the war, Sergei Ivanovich asked me to what extent the acceleration of a Vavilov–Cherenkov radiation source could be neglected — for such an acceleration was seemingly inevitable due to the radiation loss. I gave the correct answer: the acceleration is generally insignificant, which follows from calculations neglecting the acceleration. However, later I gave some more thought to the issue and grasped the heart of the matter without any computations. First, it is possible to compensate for the source (then, as well as today, an electron was usually referred to) acceleration, say, by an external electric field. Second, if the source mass is large enough, the effect of radiation, which is responsible for the variation of the source velocity, can always be treated as being arbitrarily small. In other words, the source velocity can be quite legitimately considered to be given and, in particular, constant. I also note that Sergei Ivanovich was to some extent familiar with my work in other fields as well, for he communicated about ten of my papers to *Dokl. Akad. Nauk SSSR* from 1940 to 1946.

I noted this incidentally, for I am not going to discuss physics today. I would like to touch upon other aspects and appraisals of Sergei Ivanovich's activity.

Among these there are found some distinctly negative appraisals concerning both Sergei Ivanovich's scientific level and accomplishments in physics and the political attitude he assumed. There exists an opinion that we may either speak highly of those gone or not speak at all (*de mortuis aut bene aut nihil*). This viewpoint is acceptable when we are dealing with an epitaph or even with an obituary. But after a long

lapse of time, a different formula appears to be solely correct to me: one must either say nothing or speak the truth. I therefore believe that the negative appraisals of Sergei Ivanovich should be spoken of and answered. What are these judgements?

True, not only was Sergei Ivanovich never subjected to repressions, but he also became the President of the USSR Academy of Sciences, whereas his elder brother Nikolaï Ivanovich Vavilov was arrested in 1940 and perished in prison on 26 January 1943. This gave cause to accuse Sergei Ivanovich of betraying his brother. In particular, A I Solzhenitsyn's *The Gulag Archipelago* [2] reads as follows: "Academician Sergei Ivanovich Vavilov came, after the massacre of his great brother, to be the servile President of the Academy of Sciences. (The joker with a big moustache devised this with a jeer, trying the human heart.)"

Furthermore, Sergei Ivanovich was President in the most macabre time of Stalin. And it was more than once that he had to say things, which are just monstrous from today's viewpoint and which concerned Stalin, 'the coryphaeus of all sciences', the unscientific (so-called Michurin's) biology, etc. Naturally, suchlike behavior may be condemned by those who were not familiar with Sergei Ivanovich, his status, and the general situation. I am convinced, however, that all such accusations against S I Vavilov are absolutely inconsistent. E L Feinberg writes about it convincingly and in sufficient detail [1]. I will only note here that three years ago I wrote a letter to A I Solzhenitsyn to inform him (with the enclosure of the corresponding materials) that his appraisal of S I Vavilov was wrong. Aleksandr Isaevich rang me up in response to express his satisfaction with the elucidation of the truth. I hope that the incorrect remark concerning Sergei Ivanovich will be missing from subsequent editions of *The Gulag Archipelago*.

By the way, apart from documents and dates, the attitude of Nikolaï Ivanovich's sons to Sergei Ivanovich for me is a convincing argument as regards the relations between the Vavilov brothers. In particular, Yuriï, N I Vavilov's younger son, speaks warmly of 'uncle Serezha', just as he would speak of his father. Sergei Ivanovich tried his best to take care of Yu N Vavilov and his mother — his brother's widow. As far as I was able to find out, Oleg, the elder son of N I Vavilov, who perished tragically in 1946, treated Sergei Ivanovich in precisely the same way (there are grounds to suspect that O N Vavilov was killed in revenge for his openly stated indignation at the destruction of his father). So, everything is absolutely clear about Sergei Ivanovich's alleged betrayal of his brother.

Concerning Sergei Ivanovich's activity as the President of the USSR Academy of Sciences, elected in the July of 1945, the following remark is in order. The presidential elections by the General Meeting of the Academy of Sciences at that time were purely formal in character. The president was appointed by Stalin. In this particular case, his choice was, I believe, the best from purely business-like considerations (the case in point is a physicist, and a good administrator as well). True, it is quite probable that a part was played by inherently Stalin's foul and insidious wish to appoint to a high post the brother of N I Vavilov, whom he had destroyed. Could Sergei Ivanovich decline the appointment? To my knowledge, declining Stalin's proposal was mortally dangerous at those times. What is more, immediately after the victorious completion of the war, in the society there were widespread hopes for a slackening of the dictatorship and a certain

democratization of the regime. Finally, Sergei Ivanovich realized that certain of the other possible presidential candidates would not in the least do the good for USSR science he himself was able to do (see Ref. [1]). Therefore, I am convinced that there are no grounds to reproach Sergei Ivanovich for giving his consent to become president. It is to be regretted that the expectations for the slackening of dictatorship and for taking the path of civilized development of the country were not borne out. The 'cold war' with the outer world began, and the arbitrary rule in the realms of culture and science went on in quite the pre-war fashion. It would suffice to recollect the defamation of the great Akhmatova and Zoshchenko, the Lysenkoism (Lysenko husbandry), and the defamation of so-called cosmopolitans. In these terrible conditions Sergei Ivanovich did, as far as I know, all he could to cushion the blows and save the science. In doing this he had to act against his conscience and agree to disgusting compromises. That was very hard. Hence the heart attacks and his untimely decease in 1951 on the eve of his sixtieth birthday.

To summarize, I believe that the reproaches cast upon Sergei Ivanovich — all that I know — are absolutely groundless, and we should feel only a deep gratitude for his work as the President of the Academy of Sciences. I will note, by the way, that I have, naturally, no respect for those who allow themselves to hurl stones at Sergei Ivanovich. Instead of hurling reproaches at other people, one should first of all look at oneself. To exemplify, it would suffice to recall the letter to condemn A D Sakharov signed by USSR Academy Members in 1975. It was signed by 72 people, and only five Academicians refused to do so (the Presidium of the USSR Academy of Sciences reported their names to the Central Committee of the Communist Party of the Soviet Union; see Ref. [3], p. 430). And this occurred in a time of Brezhnev, when the peril of arrest and the more so of beating and shooting was quite low.

Regrettably, the unfair attitude towards Sergei Ivanovich extended to science too and was held by some physicists. The most vivid example is P L Kapitza's letter (1936) to Rutherford, which was conveyed to Rutherford personally by P L Kapitza's spouse and not sent by post. Clearly this was a private letter, but it survived in Rutherford's archive and was published abroad [4]. This letter was later published in Russian as well [5]. I think that publishing such private letters before the lapse of many years (say, 50 years, as is customary in many cases) after the death of their author is generally incorrect. However, once this has happened, there is no escape from noting that I consider this letter to be disgraceful. I will not dwell upon a letter, the more so as I touched upon it earlier (see Ref. [6], p. 395). Furthermore, and this is more important, S P Kapitza informed me that his father had radically changed his opinion of Sergei Ivanovich by the end of his (S I's) life and probably regretted writing the above letter. Another unfair appraisal of S I Vavilov as a physicist, and not only as a physicist, is found in S É Frish's 'memoirs' [7]. Here, like in some other cases, the role of Sergei Ivanovich in the discovery of the Vavilov – Cherenkov effect is assessed quite incorrectly. To those familiar with the history of the discovery of this effect, the decisive role of Sergei Ivanovich in this brilliant accomplishment is quite evident. He proposed the topic and the method of investigation and realized at the decisive moment that the case in point is not luminescence. All this is addressed in greater detail in the books by I M Frank [8] and E L Feinberg [1]. One way or the other, the solely correct

name for the beautiful effect of emission by uniformly moving charges should bear the name of Vavilov, too. The term ‘Cherenkov effect’ adopted in the West and partly in our country is absolutely unfair. This name probably stems from the fact that initially (1934) there appeared separate papers by Cherenkov [9] and Vavilov [10]. After the nature of the effect was elucidated by Tamm and Frank [11], a manuscript was sent abroad about the discovery with Cherenkov alone as the author [12]. The paper was sent by S I Vavilov, and it remains unknown why he did not put his name, too, on the author list, with good reason for doing so. I have made some guesses about it, but I will not cite them here because they are merely guesses. The Vavilov–Cherenkov effect was then perceived as an unexpected and not nearly obvious phenomenon. This becomes clear from the fact that the manuscript of Ref. [12] was initially sent to *Nature*, but was rejected. This manuscript was later sent to and appeared in *Physical Review*, but initially was not understood, either. The latter follows from the fact that the Vavilov–Cherenkov experiments were repeated and confirmed with the use of an electron beam [13], but Collins and Reiling never understood the nature of the phenomenon — they believed they were dealing with bremsstrahlung.

Sergei Ivanovich did not know, of course, of the above-mentioned letter of P L Kapitza, but he was aware of Kapitza’s strong disapproval of him and maybe of some insults. I write about this to mention Sergei Ivanovich’s characteristic conduct and judgment, which was reported by B P Zakharchenya [14]. When Kapitza was in disgrace and worked in his country cottage at Nikolina Gora (in the ‘hut-laboratory,’ as they used to say at that time), he applied to the supply department of the USSR Academy of Sciences with a request to provide him with some materials and simple instruments, but was bluntly refused. In response to P L Kapitza’s complaint, not only did the Academy President Sergei Ivanovich Vavilov put the rude fellows in their place and order the delivery of the requisite equipment to Nikolina Gora, but he also came personally to Kapitza presumably with an apology. Next I cite Ref. [14], p. 40: “Knowing about the strained relations between Kapitza and Vavilov, N A Tolstoi, who may be referred to as Sergei Ivanovich’s student, asked him: Why did you make this fine gesture? Didn’t he criticize you severely in the past? Vavilov’s reply was: A noble act and politeness in this case are the just revenge of an intelligent person”. As mentioned above, P L Kapitza finally realized who Sergei Ivanovich was.

Next I would like to emphasize the following: not only was Sergei Ivanovich an outstanding physicist and science administrator, but also a connoisseur of the history of physics and the culture in general. This is a topic in its own right, which is discussed, among other topics, by E L Feinberg [1]. I will only note that S I Vavilov translated Newton’s *Opticks* from the Latin, is the author of several popular articles and the book *The Eye and the Sun*, and was the Editor-in-Chief of the Big Soviet Encyclopedia and several other publications. He was, as they say, ‘a Renaissance man’.

I will enlarge on Sergei Ivanovich’s contribution to Newtonology. The 300th anniversary of Newton’s birth (4 January 1643 according to the new style) fell on the most difficult (and at the same time the turning-point) period of the Second World War. It is therefore reasonable that the Newtonian anniversary celebrations were rather modest in character, and in Newton’s native land, to my

knowledge, no new books devoted to him made an appearance. But this is what is striking: thanks to S I Vavilov’s care, as many as five books were published in the USSR in connection with this jubilee! Standing out among them is the biography *Isaac Newton* written by S I Vavilov [15]. For a small volume, this book is rich and deep in content, and is perfectly written. There is no escape from mentioning the conditions in which Sergei Ivanovich wrote the book and prepared its second edition. The foreword to the first edition, which was published in early 1943, was dated November 1942. The foreword to the second edition (published in 1945) bore a date December 1944. At that time S I Vavilov lived primarily in Ioshkar Ola, for that was the site of the State Optical Institute (GOI) he was in charge of. But he spent part of the time in Kazan’, since he retained the post of the Director of FIAN, which had been evacuated to Kazan’. The hardest time full of hardships and intensive labor. What is more, Sergei Ivanovich worried about people who were dear to him, but were detached from him. Clearly, the work on Newton’s biography was done in his ‘spare time’, a work into which he put his heart and soul. The feelings and the ideas of Sergei Ivanovich were undoubtedly embodied in the book and especially in the forewords to its first and second editions. I cannot reread these forewords without emotion. This may be a manifestation of the fact that I remember that time and was in Kazan’ myself together with FIAN. I believe that those who know of the war-time only by books would not remain indifferent to these forewords, either. Here is, for example, an extract from the foreword to the first edition: “Devoting the primary effort today to assist our heroic Red Army, the USSR Academy of Sciences cannot pass by the remarkable date of the 300th anniversary of the birth of one of the greatest creators in culture — Isaac Newton. The Academy of Sciences set up a special committee to commemorate Newton’s jubilee. This biography was written following the proposal made by the committee”. And here is a fragment from the foreword to the second edition: “The second edition of Newton’s biography is being prepared in the days when the war is undoubtedly approaching its victorious completion. The peoples of Europe liberated by the Red Army and the Allied Forces from the dull and ferocious yoke of the ‘race of masters’ are regaining access to live culture and freedom. In such a time, many may be encouraged and inspired by the story of the life and work of the ‘decoration of the human race’”.

I do not pretend to a deep knowledge of the entire history of physics. However, I am rather well familiar with precisely Newton’s activity, for in 1987 I wrote a large article on the occasion of the 300th anniversary of the fundamental *Philosophiae Naturalis Principia Mathematica* (Mathematical Principles of Natural Philosophy) by Isaac Newton [16]. I therefore believe to be able to expertly assess Newton’s biography written by Sergei Ivanovich [15] and, as stated above, the appraisal is very high. In this connection Viktor Vavilov, the late son of S I Vavilov, and I myself undertook a new edition of the book *Isaac Newton* in 1989, which was provided with my foreword and an additional article (the latter is close to that of Ref. [16]).

Sergei Ivanovich Vavilov has left a deep trace on physics and the history of development of Russian science. I am glad that I still had the opportunity to give tribute to his blessed memory during today’s ceremonial meeting.

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S I Vavilov — the founder of the P N Lebedev Physics Institute

O N Krokhin

When Sergei Ivanovich Vavilov passed away on 25 January 1951, I was a 1st-year student of the Physics Department of Moscow State University. I bear firmly in mind the news of this grievous event, which came to us, students, from our teachers during our university hours. I remember the atmosphere which was perceived as the loss of an outstanding personality of a national scale. As many as 50 years have passed since then, an entire generation of people has been superseded, the life and the country have drastically changed, but I sometimes ask myself the question: how would Sergei Ivanovich have acted now, in our time, and how would he have responded to the circumstances which have placed our science in a difficult situation?

That time was also hard, both as regards financial situation and a strong ideological oppression which sometimes resulted in moral and even physical destruction of scientists. Sergei Ivanovich received all that in full measure. Vsevolod Vasil'evich Antonov-Romanovskii recalls S I Vavilov's reply to his request, probably not quite appropriate: “Ah, Vsevolod Vasil'evich, I should now rescue Soviet physics!” [1]. This was said at the turn of 1948–1949 when, according to the directions of the Secretariat of the CPSU

Central Committee, an All-Union Meeting of the heads of physics chairs of universities and higher schools was being planned with the purpose of an ideological pogrom. It is well known that S I Vavilov, together with I V Kurchatov, hampered the calling of this meeting in every possible way. In January 1949, he managed to achieve the cancellation of the meeting at the cost of making a proposal to establish the Scientific Secretariat of the Presidium of the USSR Academy of Sciences.

During his Academy presidency, Sergei Ivanovich was presumably having a very hard time of his life. Yu N Vavilov, the son of N I Vavilov — Sergei Ivanovich's brother, an outstanding biologist, who perished in the Saratov prison in 1943¹ — recalled that Sergei Ivanovich said, supposedly at one such moment of his life: “The post of the President of the Academy of Sciences is a dog's post, and I would readily change it for a plumber's job”.

Of course, this phrase by no means reflects what we know from the history of the Academy of those years. It was Sergei Ivanovich who lay the foundation of the present-day Academy of Sciences. The Academy strengthened and expanded; a start was made on the solution, in the depths of the Academy, of those problems which foster scientific and technical progress; during the post-war years, the Academy stood at the forefront of scientific and engineering revolution.

I am convinced: should Sergei Ivanovich find himself with us, he would decisively stand up for the interests of science and would be ready to accept this, as he put it, ‘dog's post’.

Professionally, Sergei Ivanovich was an optical scientist and, in particular, devoted much time to the problems of luminescence. In this regard he had the opportunity to work within the circle of the most prominent optical physicists of our country: during his youth — in the laboratory of P N Lebedev who discovered the pressure of light, and later on with L I Mandel'shtam, G S Landsberg, I E Tamm, I M Frank, and P A Cherenkov — in FIAN. The works of these scientists amounted to three Nobel prizes, of which only one was actually awarded — that which should rightfully bear the name of Vavilov for the discovery of the Vavilov–Cherenkov effect. The scientific school and the style of work inculcated by S I Vavilov in FIAN undoubtedly contributed to the discovery of masers and later of lasers by N G Basov and A M Prokhorov — one more Nobel prize.

S I Vavilov succeeded D S Rozhdestvenskii as the scientific supervisor of the State Optical Institute in Leningrad. In the post-war years, S I Vavilov initiated the establishment of the Institute of Applied Physics (nowadays this is a big enterprise — the ‘Orion’ Scientific-Production Association), whose research field covered the development of infrared technology and optoelectronics.

Therefore, it is valid to say that S I Vavilov was the soul and organization engine of our optical science throughout these pre-war, war, and post-war years.

The P N Lebedev Physics Institute in its present-day form was established by S I Vavilov in March of 1934 [2]. Genetically, it traces its origin from the Physics Study of the Cabinet of Curiosities in Petersburg in the distant past. The

¹ V F Sennikov, a staff member of FIAN, discovered S I Vavilov's letter addressed to I V Stalin, which was dated 1949, requesting the exoneration of N I Vavilov. S I Vavilov denied categorically the inimical actions ascribed to N I Vavilov and emphasized his openness and the straightforwardness of his judgement. S I Vavilov wrote that these accusations were slanderous. This letter bears L P Beriia's resolution: “To be rejected”.