CONTENTS

Academician V.F. Zelenin: mysteries of the scientist's fate and of his beginnings

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The authors of the article on the basis of literary and archival materials restore scientific biography of academician V.F. Zelenin. This topic is free of clichés and distortions, usual for anniversary works. There is f reminiscent a documentary history of the forgotten State higher medical school and founded by him Medico-biological Institute in the article. On the huge historiographical material authors reveal the formation of domestic electrocardiography and clarify the role of the V.F. Zelenina in "the doctors case".

***Keywords**: history of medicine, cardiology, V.F. Zelenin, The State Higher School of Medicine, Medico-biological Institute, electrocardiography, «doctors case»*

A leading professor at the 2nd Moscow Medical Institute, a prominent researcher and cardiologist, academic-secretary of the clinical department founded in 1944 at the USSR Academy of Medical Sciences, and the first director of the Academic Institute of Therapy – the successfully practicing therapist Vladimir F. Zelenin was one of the most popular medical professionals in the mid-20th century. However, a trouble-free life is a rare thing, and Zelenin was not dealt such a lucky card. It should be recalled that in 1946-1947 (that is, over two to three years), he lost the high positions that he held, the Institute of Therapy that he created no longer bore his name but the name of A. L. Myasnikov, in 1952 he also left the department, and in 1953 he was arrested in the so-called Doctors' Plot. The need for further work on his scientific biography is obvious.

Zelenin (1881-1968) was born on 16 June, 1881 (old calendar) [1], was an Orthodox Christian (as detailed on his university degree) and came from a merchant background in the Orel province. His father's ancestors were serfs, so he was only being a little sly when he listed on all his Soviet-era documents that his "social origin" was "born to the family of a former serf." [2] Such a ploy was common for professors of the time (given the class politics of the Soviet state, even hereditary nobleman D. D. Pletnev listed himself as coming from a "clerical staff" background). His want-for-nothing and carefree childhood ended quickly: his father went bankrupt, and the 14-year-old schoolboy Volodya, the family's 13th child, had to make a living by tutoring.

In his background documentation ("biography") Zelenin did not forget to mention his participation as a student in revolutionary events: he was expelled from the Military Medical Academy "in 1902 after his arrest and imprisonment in connection with the preparation of a demonstration at the Kazan Cathedral on February 8." In accordance with the rules in force in the Russian Empire, it did not prevent him from graduating in 1907 from the medical faculty of Moscow University [3], after which he served as a junior doctor at the 1st Grenadier Artillery Brigade (which he resigned from in 1913) and at the same time worked on his thesis at the University Pharmacology Institute [4].

Zelenin began pedagogical work in 1913 as an assistant professor in the faculty therapy department with Professor N. F. Golubov, a close disciple of G. A. Zakharyin. Subsequently, Zelenin jokingly referred to himself as the "grandson" of Zakharyin and his students as the "great grandchildren" of the great clinician;

Golubov – as their teacher – signed off on their works. Does this provide a sound reason to believe that Zelenin was a pupil of Golubov? They did not produce any joint publications and they could not have: the problems of physiology and heart pathology were not the focus of research attention for the professor, he was not a master of electrocardiographic methodology. According to a report on the status and work of the Imperial Moscow University for 1914, the faculty clinic acquired the Bock-Thoma electrocardiograph system under Golubov, but the money for it was bequeathed by the previous head – L. E. Golubinin. The apparatus "was in the superintendence of electrocardiography expert and assistant professor V. F. Zelenin, who carried out numerous electrocardiographic studies at the clinic." [5] The professor delegated the running of the clinic to his assistants. According to the memoirs of M. P. Konchalovsky, "Golubov did not carry out rounds. He only lectured. This he carried out in an original manner, without a special technique, but the students listened to him, because he did not speak in a boring manner, but with a turn of phrase and practical advice." [6] Nevertheless, Zelenin's future medical personage may indicate the influence on him of Zakharyin's approach to the patient, with his special attention to the individual, the mechanisms of vegetative and hormonal regulation while within normal physiological range and while ill, and psychotherapeutic methods of stimulating patients. As for his choice of a main field for scientific research, the following circumstances are significant.

The young doctor's dissertation topic was suggested by the director of the Pharmacological Institute (which acquired an ECG apparatus in 1909) – professor of pharmacology S. I. Chirvinsky – but he did not carry out any real scientific supervision, according to the memoirs of the dissertationist. Zelenin himself considered professor at the Düsseldorf Academy of Practical Medicine A. Hoffman as his mentor in matters of the instrumental study of cardiac functions. He was an intern with Hoffman in 1911, continuing (after his thesis defense) research started at Moscow University. Furthermore, it is known that Zelenin spoke of the profound influence on him of A. B. Fokht, a Moscow therapist, pathologist and founder of experimental cardiology in Russia (this is confirmed by a researcher of A. B. Fokht's scientific school of thought – Y. A. Shilinis – and V. F. Zelenin's son, Professor A. V. Zelenin).

In the first half of the 1910s, besides his dissertation and experimental study on the topic of "Changing the electrocardiogram under the influence of the digitalin pharmacological group" (1911), Zelenin published an article "Electrocardiogram" (1910) [7] which described a new method – one of the first in Russia (after A. F. Samoilov in 1908 and S. S. Steriopulo in 1909 and at the same time as P. S. Usov, I. V. Golovinsky and F. A. Andreev). He spoke at the 3rd Congress of Russian Physicians (1911) with a presentation on electrical recording phases of cardiac activity and the diagnostic value of "action currents" of the heart. He published the articles "Electrodiagnostics of heart disease" and "Electrocardiography and its clinical significance" (1913). In Russia at that time there was broad clinical testing of a new method for the diagnosis of heart disease; there were many more skeptics and opponents than supporters of the method. At this difficult stage of developing the method, Zelenin became one of its pioneers, promoters and research developers (he proposed the concept of the bicardiogram, which has received international recognition).

The 1920s can be considered the second phase in the history of Russian clinical electrocardiography. At the Medico-Biological Institute in the mid-1920s, Zelenin created one of the first electrocardiograph examination rooms in Soviet Russia. Other electrocardiograph examination rooms included M. E. Mandelstam's in Petrograd, in the clinic of G. F. Lang (Petrograd Institute for Advanced Training of Physicians); in propaedeutic, faculty and hospital therapeutic clinics at the 1st Moscow State University (MGU); and in Kislovodsk (A. Z. Chernov), among others. The institute published the valuable publications of Zelenin and his disciples L. I. Fogelson, I. A. Chernogorov and others, mainly on methodological issues and problems of electrocardiography and cardiac arrhythmias, and produced the first Russian textbook on electrocardiography. [8] Consequently, there is every reason to call Zelenin, along with A. F. Samoilov, one of the founders of electrocardiography in Russia and the USSR.

Clinical medicine at the beginning of the 20th century entered a period of improved diagnostic capabilities for instrumental methods of patient diagnosis – radiological, electrocardiographical, the bloodless method for determining blood pressure and others. Leaders of this international process appeared in clinics in Germany and France. Working in Dusseldorf with Hoffman, Zelenin conducted research with simultaneous recordings of the electrocardiogram, phonocardiogram, apexcardiogram and the carotid pulse. Later he continued his research with an apparatus acquired by the faculty clinic at Moscow University, which Zelenin described as "the one and the same device (the Bock-Thoma system) used in electrocardiogram recordings of heart sounds and physical bends (arterial and venous pulse and cardiac impulse), which are then easily subjected to comparative analysis." [9]

In 1915, Zelenin appeared before doctors in Moscow and reported on cardiotocography as a new clinical method of diagnosis, and in the same year published his work on the subject – the first in Soviet literature. [9] With the creation of the Biomedical Institute, these studies were continued by him together with Fogelson. [10] Imperfections in the equipment and a lack of clinical relevance (only in the second half of the 20th century did the need arise for more accurate diagnosis of heart disease due to the success of surgical treatments) became an obstacle to the widespread use of the new method in clinical practice in the first half of the 20th century. However, this does not negate the obvious fact that in the history of cardiology, Zelenin was the pioneer in Russian phonocardiography.

Having always felt like "a man of the people," Zelenin greeted the 1917 October Revolution and the large-scale transformation initiated by the Soviet authorities with a desire to actively take part. In this he differed from the majority of his colleagues (as is well known, medical science and social organizations called for a boycott of the new government and its new methods). According to Zelenin's memoirs, his father always had the feeling that in the traditional university professorial environment he was perceived as an outsider: he never felt an easy familiarity with D. D. Pletnev, M. P. Konchalovsky or E. E. Fromgold. It would seem that it was no coincidence that such a relationship was quickly established with another professor "of the people" – surgeon N. N. Burdenko.

Zelenin began active cooperation with the Soviet authorities in the organization of the State Higher School of Medicine (GVMSh) in Moscow. Not coping with the training load (according to Zelenin's memoirs, "up to 1,000 people were in the course"), the university medical faculty was forced to open the so-called parallel branch where from 1917 to 1919 Zelenin was a professor and director of the propaedeutic clinics, and then the question of the creation of a new, additional medical school arose. In May 1919, the 1st MGU committee elected by the professors under chairmanship of L. O. Darkshevich (his deputy – P. M. Popov, secretary – Zelenin) was informed by Zelenin on the agreement in principle of the People's Commissar of Health N. A. Semashko and his deputy and head of the Main Military Medical Administration Z. P. Solovyov, to provide the First Communist Red Army (Lefortovsky) Hospital with its needs for clinical teaching. On May 30, Zelenin informed the commission that the board of the People's Commissariat for Education approved the faculty decision on the creation of GVMSh and offered to prepare estimates for employing staff, the educational and economic component and special equipment. On June 6, 1919, the commission received an official notice signed by the Deputy Commissar for Education M. N. Pokrovsky: "The resolution of the board of higher educational institutions of the People's Commissariat for Education of 30th of May this year has established the commission on the organization of a new medical school in Moscow consisting of 25 persons elected at the meeting of the medical faculty of the 1st Moscow University on May 19," that provided the "rights of the legal body to carry out all the necessary arrangements."

In the discussion of candidates for the positions of heads of GVMSh departments held on August 1, 1919, Professor Zelenin was approved as head of the department of diagnosis with its propaedeutic clinic. On August 23, 1919, the GVMSh council elected L. O. Darkshevich as rector; among the five members of the board was Zelenin. [11-13]

There were constant organizational and financial difficulties, which substantially

interfered with the normal operation of the school. In response to regular complaints about a lack of funds and requests for further financing by the assistant rector for academic affairs and research, Zelenin, and vice-rector of the school, E. K. Sepp, GVMSh's chief patron Pokrovsky with frustration admitted: "If you only knew how I am harassed due to your school, I literally cannot stand to have lunch in the Kremlin." [14] What kind of "scientific-pedagogical" problems had to be solved was indicated in the minutes of the new university's board meetings. For example, it was deemed necessary to resolve the issue of transporting employees to their workplaces. It was a long distance from the Prechistenka lanes and Devichye Polye (the primary residential areas for the faculty's staff) to Lefortovsky Hospital. It was not an easy journey while faint from hunger and disease, especially in the winter amid snow drifts in conditions of sharply increasing crime. In this regard, the GVMSH board periodically returned to the question of the transport. Zelenin was particularly active in this regard: in the first half of 1920, he managed to get a couple of horses at first, and then a broken-down car, for which 900,000 rubles for repairs was requested from the People's Commissariat for Education. At a meeting of the board, Zelenin solemnly declared: From November 11, 1920, a tram has been allocated for teachers, which will leave at nine in the morning from Devichye Polye for Lefortovo, and at 4 pm take them back from the hospital and along Bolshaya Tsaritsinskaya (later Pirogovskaya) Street. [15]

The unsuccessful attempt to change the clinical foundations of the school demanded great organizational efforts and enthusiasm from Zelenin. In discussing this issue in 1921, he described the unsatisfactory state of the school in the 1st Communist hospital and offered to have it transfered to Kudrino, where it could be incorporated into the clearing hospitals – Sofiiskaya Children's Hospital, Rzhevsky Hospital and several other former medical and educational institutions. He pointed to the local authorities' approval, and read an excerpt from a meeting held on the same day of the Krasnopresnensky Council Presidium, which considered it appropriate to relocate the schools into the district. [16]

In 1921, the government repurposed the school for the accelerated training of doctors from former military paramedics, who now constituted the bulk of the students at GVMSh. This reinforced the attitude of university professors that the school was a third-rate institution, where, in the words of Zelenin, "the negligent, latecomers and paramedics were exiled." However, on April 2, 1923, the board received a notice that a petition signed by Sepp, the new rector of the school, which confirmed: "The council for higher education institutes hereby announces that the Presidium of the Board of the Directorate of Vocational Education, in a meeting on March 27 has decided on the basis of the decision by the State Scientific Council to rename the Moscow Higher Medical School to Moscow Medical Institute." [17] This institution did not have a number, because only in the 1930s did the medical faculties of the two universities became the independent 1st and 2nd Medical Schools, but Muscovites soon began to call it "the third medical." In his "Biography" (1944), Zelenin pointed out that in the 1919-1923 period he was a professor "in the same", i.e., in the propaedeutic "department of the 3rd Medical Institute, from 1923 to 1925 director of the faculty therapeutic clinic of the same university." [2]

This rash creation resulting from the constant reorganizations of the time – the Moscow Medical Institute – was very short lived, as evidenced by the "Directorate of Vocational Education Instruction No. 36": "In view of the expiry of the term of office for the Board of the 2nd Moscow State University and the Board of Moscow Medical Institute, and in view of the forthcoming merger of medical faculty of the 2nd Moscow State University with the Moscow Medical Institute, the Directorate of Vocational Education has assigned to the organizational commission ... the Management Board of the 2nd Moscow State University and Moscow Medical Institute, from this point in time Deputy of the People's Commissariat for Education and Head of Directorate of Vocational Education Khodorovsky is to start work on the designated organization commission. June 11, 1924." [18][1]

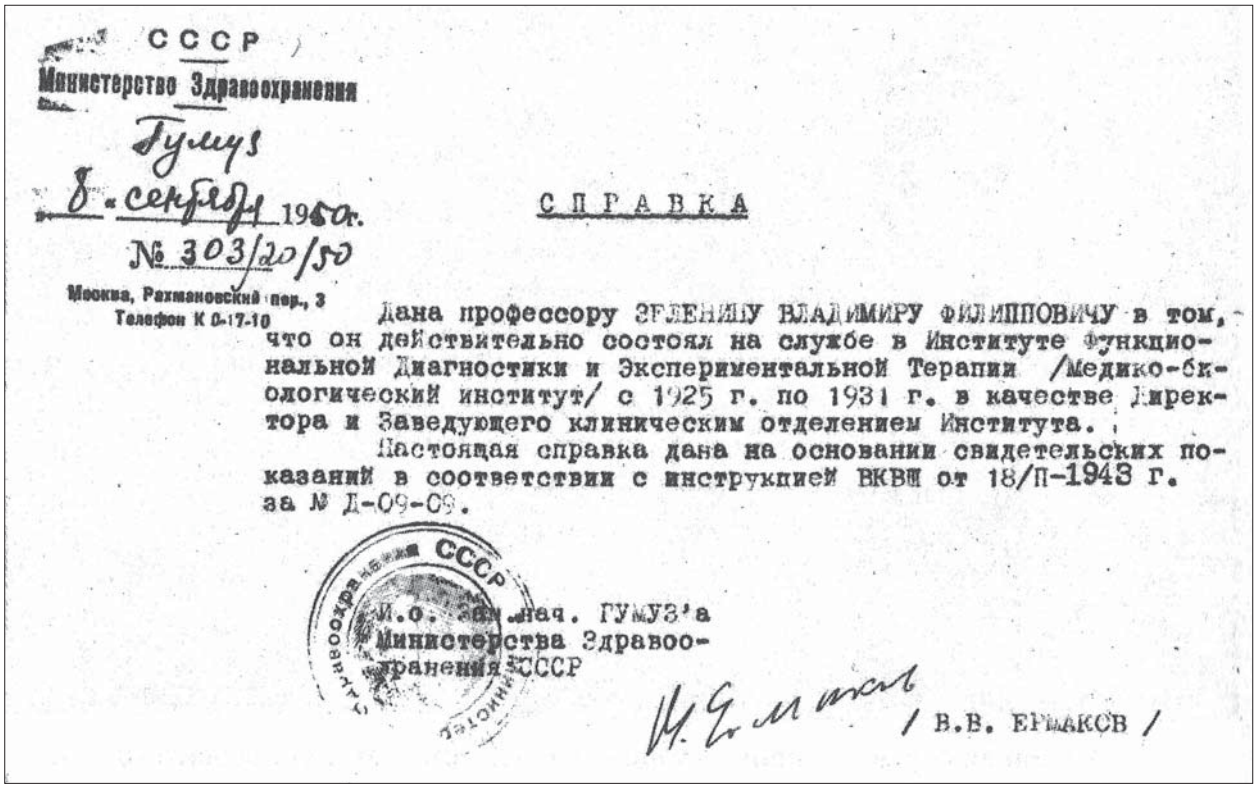
Official biographies and archival documents show that in the same year of 1924, at Moscow University, Zelenin began to organize an integrated

[1] The particularities of the original cited materials have been retained.

scientific institution that was fundamentally new in terms of its goals – the Clinical Institute of Functional Diagnostics and Experimental Therapy. The decision on its establishment, and the funds needed to purchase equipment and other institute necessities from abroad, were obtained with the vigorous support of the head of the Directorate of Scientific, Artistic and Museum Institutions – prominent Bolshevik F. N. Petrov – Zelenin's former patient who became his friend and patron. In 1925, the new institution was opened. Its structure included a clinical department with an endocrinology sector, a department of physiology, pathophysiology and biochemistry, and later neurological and other departments that were supposed to ensure the development of the physiology and the pathology of blood circulation and study of the issues of neurohumoral regulation. Director V.F. Zelenin (Fig. 1) managed to attract major scientific contributors: executive members of the institute were A.A. Bogomolets, S.N. Davidenkov, A.A. Kulyabko, M.Y. Sereisky and L.S. Stern. Soon the scientific institution became the Medico-Biological Institute under the Directorate of Scientific, Artistic and Museum Institutions and became widely known this under this name. The results of research were published primarily in the Medical and Biological Journal edited by Zelenin (1925-1930). At the institute the students of Zelenin, Fogelson, I.A. Cernogorov, I.B. Kabakov and others worked on methodological and clinical issues of electrocardiography, beginning the formation of Zelenin's scientific school of cardiology.

Fig. 1. Professor V. F. Zelenin (late 1920s).

The fate of the highly relevant and promising research institute, the favorite "child" of Zelenin, on the one hand, could have been the exciting plot of a detective novel, and on the other it was a distinct example of one of the distinguishing characteristics of science and scientific institutions' development in the Soviet era. Expanding the research topics, the director invited geneticists to the institute, demonstrating his scientific "sense" for all things new and promising: human genetics was developing rapidly, at a faster pace than biological science. In 1928, the office for the study of heredity in the Medico-Biological Institute was headed by the therapist and geneticist Solomon Grigoryevich Levit, a Bolshevik since 1920, before he began working as an intern and assistant at the Department of Hospital Therapy at the 1st Moscow Sate University. From 1926, as a member of the board of the university, he had pursued the "party line" in matters of science and higher education and was the organizer (in 1924) of the university Society of Materialist Doctors, while the deputy chairman of the Society of Materialist Biologists. A group of young scientists led by Levit quickly asserted itself, producing extensive medical and genetic studies at the institute, which had a global impact. Levit's strong party ties were then put to use. Founder and director of the Institute Zelenin realized the situation too late; he no longer had a reliable patron – Petrov had been transferred from the Directorate of Scientific, Artistic and Museum Institutions to head the All Union Society for Cultural Relations. Zelenin was offered the chair of the 2nd Moscow State University, retaining the leadership of the clinical department at the Medico-Biological Institute (but as it soon turned out, only for a short period of time). Thus, Zelenin had to give up his college and become a professor of the 2nd Moscow State University, as evidenced by the "Order of the 2nd Moscow University No. 103: "Zelenin is confirmed as professor of the propaedeutic clinic as of July 1 of this year; he is transferred prior to approval to the post of professor of the hospital therapy clinic from September 1 while simultaneously assigned the duties of professor of the propaedeutic clinic of assistant V. N. Vinogradov at 1st Moscow State University from September 1 of this year. Rector / Pinkevich/ Moscow September 12, 1929." [19]



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СПРАВКА

Дана профессору ЗЕЛЕНИНУ ВЛАДИМИРУ ФИЛИППОВИЧУ в том, что он действительно состоял на службе в Институте функциональной Диагностики и Экспериментальной Терапии /Медико-биологический институт/ с 1925 г. по 1931 г. в качестве Директора и Заведующего клиническим отделением Института.

Настоящая справка дана на основании свидетельских показаний в соответствии с инструкцией ВКВШ от 18/П-1943 г. за № Д-09-09.

М.о. зам. нач. ГУМУЗ'а
Министерства Здравоохранения СССР
/ В.В. ЕРШАКОВ /

Fig. 2. Certificate issued to V. F. Zelenin September 8, 1950. [2]

The new director of the Medico-Biological Institute (from 1930) Levit immediately began to change the main subject of research, and then changed the name of the institute, which in 1935 was renamed the Gorky Medical Genetic Institute, which became a leading European center for medical genetics. Basking in glory did not last long: In 1936, Levit was expelled from the party for "lobbying hostile theories," and in 1938 he was arrested and then shot. The Medico-Genetics Institute was eliminated, which with academic T.D. Lysenko's active participation was part of the state and party's pogrom against human genetics ("eugenics") and medical genetics. Classical genetics was "finished off" in a "second round" by "Michurinist biology" at the end of the 1940s. As such the "bourgeois pseudo-science" (in the terminology of the time) of genetics was put to an end (fortunately temporarily) in the Soviet Union.

The Medico-Genetic Institute was destroyed together with its archive. If it were not for Medical and Biological Journal and its employees' other publications, it would not be unreasonable to ask the question: did this institution even exist? While collecting the necessary documents for applying for a pension, Zelenin was forced to prove his directorship of the "mythical" institute with the help of testimonies from Petrov and Professor B.B. Kogan. On the basis of this testimony he was given a certificate (figure 2).

At the department of hospital therapy at the 2nd Moscow State University (from 1930 – the 2nd Moscow Medical Institute), located in the 5th Soviet hospital, Zelenin replaced Konchalovsky, who moved to the 1st Moscow State University, where he spent the rest of his life as a professor (1929-1952). The professor's carefully prepared lectures, his clear musings, alive through their presentation, with their immaculate structure, the high level of ongoing methodological work of the department; the textbook on internal medicine that was most popular for decades, written with E.M. Gelshteyn [20, 21] – all this suggests that Zelenin was, in the words of I.B. Likhtsier, "one of the best teacher-clinicians of his time."

Like all of his prominent contemporary clinicians, Zelenin was a generalist physician, but from the beginning to the last years of his creative

career the main subject of his research and his scientific authority was mainly related to the development of the physiology and pathology of the heart and blood vessels: electrocardiography, cardiac arrhythmias, acquired heart disease, angina, hypertension, pulmonary heart syndrome – this is an incomplete list of these subjects. The formation of Zelenin's scientific school of cardiology was completed at the department of the 2nd Moscow Medcial Institute (Fogelson, Chernogorov, Likhtsier and others; figure 3).

As the first director of the Institute of Experimental and Clinical Therapy at the Academy of Medical Sciences of the USSR (from 1944) [22], which was created in the most the country's difficult period, just at the end of World War II (the institute did not have its own building and the academy has few resources), every day during the organizational period Zelenin was forced to deal with not only staffing and other management issues, but also a variety of economic problems concerning the institute's survival. These are the main issues in the institute report from 1946 and in the Institute of Experimental and Clinical Therapy director's statement to the government commission (1947): "The Institute of Experimental and Clinical Therapy of the Academy of Medical Sciences of the USSR was founded at the end of 1945 and is located on the foundation of the 5th hospital in the Ministry of Health's city network. ... the Institute of Experimental and Clinical Therapy was gradually created from five sectors: 1) gastroenterological at the Botkin Hospital (head – Professor Chernogorov), 2) cardio-angiological sector (head – active member of the USSR Academy of Medical Sciences, Professor Zelenin), 3) clinical and electrophysiological laboratory (head – active member of the USSR Academy of Medical Sciences, Professor Vinogradov), 4) functional

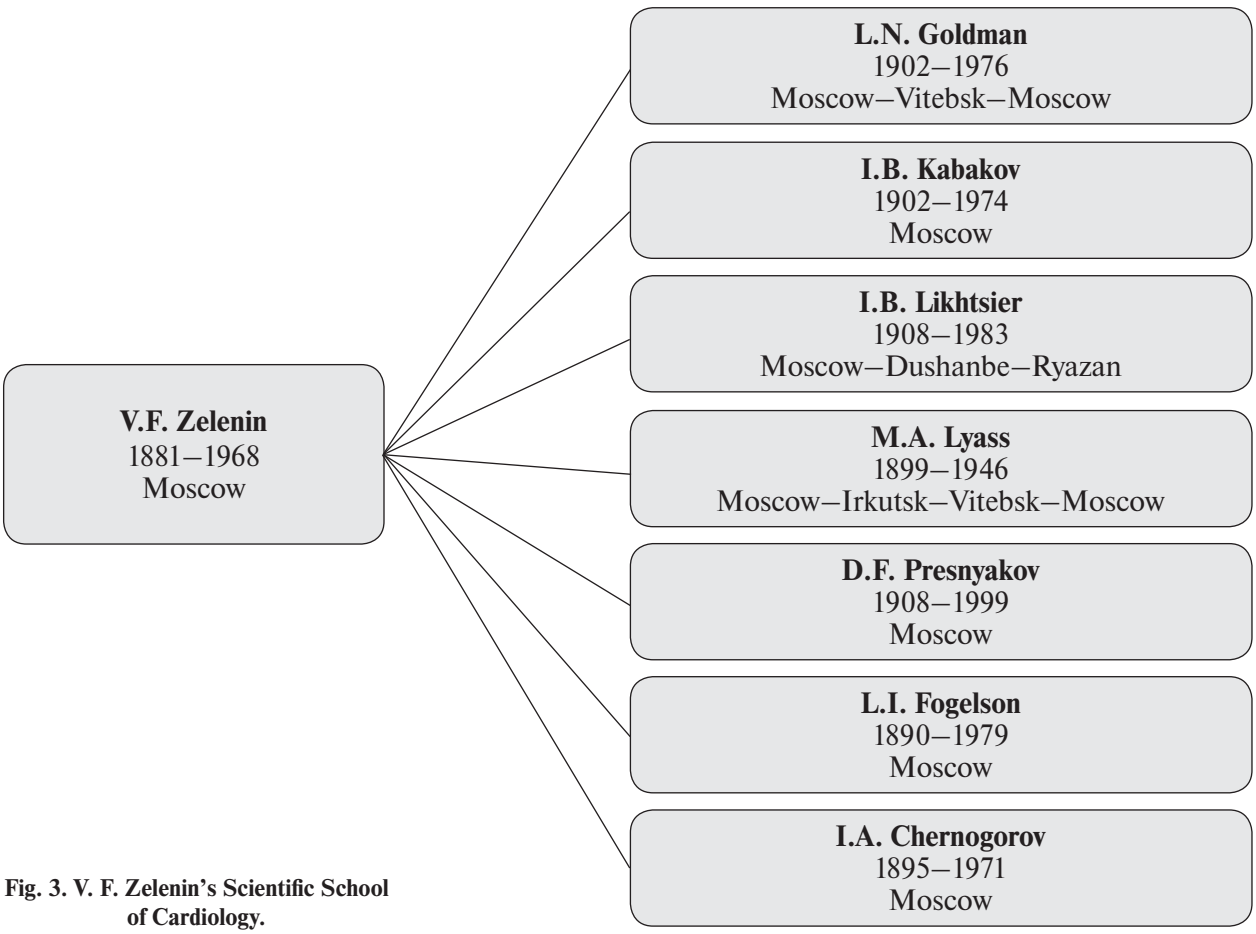

Fig. 3. V. F. Zelenin's Scientific School of Cardiology.

diagnostics sector (the clinic of Professor E.M. Tareev), 5) disability studies sector (the clinic of Professor Fogelson and the Institute of expertise). ... After the minister of health rejected the idea of even beginning construction of a building for the institute ... in the 4th Five-Year Plan, the situation was completely hopeless and intolerable for the institute." [23, 24]

Despite difficulties in the organizational phase (1945-1947), Zelenin managed to expand research on the problems of hypertension, angina pectoris, and pulmonary heart disease, summarized in the publications of Zelenin and his colleague Likhtsier. This determined the line of cardiology work, extended later (from 1948) by A. L. Myasnikov, and the evolution of this new therapeutic research center: The Institute of Therapy – the A. L. Myasnikov Institute of Cardiology (1967) – A. L. Myasnikov Institute of Clinical Cardiology Cardiology Research Center (1975).

Why, without any fight (and perhaps, on his own initiative), did Zelenin resign from the prominent positions of academic-secretary and head director of the scientific research institute in 1946-1947? According to the memoirs of his son A. V. Zelenin, V. F. Zelenin felt burdened by the socio-political situation in the country in the post-war years, with the increasing ideological dictatorship, complete isolation from the cultural and scientific life of the rest of the world, a gross interference of party organs in a purely scientific matters, and state anti-Semitism. [25] The activities of a senior head of science at that time – under the conditions of totalitarianism and destruction – demanded youthful ambition and a constant forceful effort to overcome the endless daily large and small obstacles, and unprincipled flexibility, resourcefulness, verging on obsequiousness. But Zelenin was 70, he already felt like an old man, all the more inclined to appreciate not a high social status, but peaceful (without persistent conflict) creative work and "quiet joy."

At the end of 1952, after suffering a myocardial infarction, Zelenin left his post, which had been greatly contributed to by the atmosphere of increasing repression: the arrests of prominent doctors – consultants of the Kremlin's Health Sanatorium Directorate, among who, of course, were his close friends and acquaintances. On January 8, 1953, Zelenin was arrested – in the infamous "Doctors' Plot." After the case was dropped, he was released from prison and rehabilitated (in April 1953), but he did not return to his medical-academic career. The last 15 years of his life were spent working on a textbook on the diseases of the cardiovascular system, reading his favorite books, communicating with friends and spending time with his family.

Zelenin's final scientific work, "Diseases of the cardiovascular system" (1956), summarized the development of national cardiology in the first half of the 20th century, when it ws not considered separate from therapy as an independent scientific and academic discipline, and was only transformed on the basis of new possibilities of instrumental diagnostics (ultrasound, phonocardiography, coronary angiography, etc.), drug therapy, surgical correction of heart defects and disorders of coronary circulation.

Zelenin died on October 19, 1968. Through his life he maintained a clarity of thought and kindness, but his last years were overshadowed by an almost complete loss of eyesight. Zelenin was buried at Novodevichy Cemetery in Moscow.

REFERENCES

1. *Tsentral'nyy* istoricheskiy arkhiv Moskvy (Central historical archive of Moscow). F. 418. Op. 316. Ed. khr. 310 (The student case of Vladimir Zelenin). L. 9. The metric certificate [in Russian].
2. *Semeynyy* arkhiv A.V. Zelenina (A.V. Zelenin family archive) [in Russian].
3. *Tsentral'nyy* istoricheskiy arkhiv Moskvy (Central historical archive of Moscow). F. 418. Op. 316. Ed. khr. 310. L. 14. A letter to the Rector of the Imperial University of Moscow from the Ministry of Internal Affairs [in Russian].
4. *Tsentral'nyy* istoricheskiy arkhiv Moskvy (Central historical archive of Moscow). F. 418. Op. 418. Ed. khr. 74 (The case of reviewing by the medical faculty of the Vladimir Zelenin's dissertation for a doctorate of medicine). L. 5. Curriculum vitae of V.F. Zelenin [in Russian].
5. *Otchet* o sostoyanii i deystviyakh IMU za 1914 g. (Report on the status and activities of the Imperial Univer-

sity of Moscow for 1914) [in Russian].Ch. II. M., 1915. P. 152.
6. *Konchalovskiy M.P.* Moya zhizn', vstrechi i vpechatleniya (otryvki iz knigi) [My life, meetings and impressions (excerpts from the book)] (in Russian). Istoricheskiy vestnik MMA im. I.M. Sechenova. Vol. 6. M. 1996. P. 103.
7. *Zelenin V.F.* Elektrokardiogramma i ee znachenie dlya fiziologii, obshchey patologii, farmakologii i kliniki (Electrocardiogram and its relevance for physiology, general pathology, pharmacology and clinic) [in Russian]. Voenno-meditsinskiy zhurnal, 1910. Vol. 228. N 8. P. 677–688.
8. *Fogel'son L.I.* Osnovy klinicheskoy elektrokardiografii (Basics of clinical electrocardiography) [in Russian]. M., 1929.
9. *Zelenin V.F.* Kardiofonografiya (registratsiya serdechnykh tonov, resp. shumov) i ee klinicheskoe znachenie [Kardiofonografiâ (registration of heart tones, resp. noise) and its clinical significance] (in Russian). Meditsinskoe obozrenie. 1915. Vol. 84. N 14–15. P. 173–204.
10. *Zelenin V.F.*, Fogel'son L.I. Fonogramma i «pushechnyy» ton pri serdechnoy blokade (Phonogram and "Cannon" tone in heart blockade) [in Russian]. Mediko-biologicheskiy zhurnal. 1926. Vol. 2. N 3. P. 12–23.
11. *Tsentral'nyy* arkhiv goroda Moskvy (Moscow central archive). F. 726. Op. 4. Ed. khr. 8 (Protocols of the meetings of the Commission on the reform of higher medical education 23.05.1919–05.08.1919). Ll. 2, 3. Protokol of the meeting of the Commission on the Organization of a new independent medical school in Moscow [in Russian].
12. *Tsentral'nyy* arkhiv goroda Moskvy (Moscow central archive). F. 726. Op. 4. Ed. khr. 1 (Protocols and extracts from them of the meetings of the board, of the department of social hygiene, interagency commission, conference of doctors, college of higher education, the central work of insurance. Reports, information about the progress of students and members of the bureau of the commission and the project of clinics placement). L. 17. To the commission of the organization of a new medical school in Moscow [in Russian].
13. *Tsentral'nyy* arkhiv goroda Moskvy (Moscow central archive). F. 726. Op. 4. Ed. khr. 3 (Protocols of the meetings of the Board of State higher medical school in 1919, 1920–1923 years). Ll. 1–3. Protocol of the inaugural meeting of the board of state higher medical education in Moscow, August 29, 1919 [in Russian].
14. *Zelenin V.* Embrional'nyy period MMI. Revolyutsionnym putem – k znaniyu (Embryonic period of IME. Revolyutsionnym putem – k znaniyu) [in Russian]. M., 1925. P. 27.
15. *Tsentral'nyy* arkhiv goroda Moskvy (Moscow central archive). F. 726. Op. 4. Ed. khr. 44 (Protocols of the meetings of the board of higher medical school 10.02.1920–03.12.1920). Ll. 107 (Protocol of the meeting of board of higher medical school, October 19, 1920), 115 (Protocol of the meeting of board of higher medical school, November 9, 1920) [in Russian].
16. *Tsentral'nyy* arkhiv goroda Moskvy (Moscow central archive). F. 726. Op. 4. Ed. khr. 3 (Protocols of the meetings of the state higher medical school in 1919, 1920–1923). L.l. 107–109. Protocol of the emergency meeting of the board of state higher medical education in Moscow, took place March 30, 1921 [in Russian].
17. *Tsentral'nyy* arkhiv goroda Moskvy (Moscow central archive). F. 726. Op. 4. Ed. khr. 1. L. 150. To the board of the Moscow medicine higher school [in Russian].
18. *Tsentral'nyy* arkhiv goroda Moskvy (Moscow central archive). F. 726, op. 4, Ed. khr. 1. L. 219. The order about GAVPROFOBR № 36 [in Russian].
19. *Tsentral'nyy* istoricheskiy arkhiv Moskvy (Central historical archive of Moscow). F. 714. Op. 2. Ed. khr. 953 (Personnel management 27.10.28–12.05.30). L. 46. The order about the 2-nd Moscow University of 20.09.1929 [in Russian].
20. *Gel'shteyn E.M.*, *Zelenin V.F.* Uchebnik chastnoy patologii i terapii vnutrennikh bolezney (Textbook of the private pathology and therapy of internal diseases) [in Russian]. 4 ed. M.–L., 1940.
21. *Zelenin V.F.*, *Gel'shteyn E.M.* Chastnaya patologiya i terapiya vnutrennikh bolezney (Private pathology and therapy of internal diseases) [in Russian]. M., 1949.
22. *Gosudarstvennyy* arkhiv Rossiyskoy Federatsii (State archive of the Russion Federation). F. 5446. Op. 1. Ed. khr. 230. L. 64–73. The order of SNK of USSR № 797 from 30.06. 1944 about the establishment of the Academy of medical sciences of the USSR [in Russian].
23. *Gosudarstvennyy* arkhiv Rossiyskoy Federatsii (State archive of the Russion Federation). F. R9120. Op. 2 (Documents, devoting to the activities of the IEiKT of Academy of medical sciences of the USSR (transcripts, orders and reports). Ed. khr. 352 L. 6–10. Statement of Prof. V.F. Zelenin to the Government Commission, inspecting AMS USSR [in Russian].
24. *Gosudarstvennyy* arkhiv Rossiyskoy Federatsii (State archive of the Russion Federation). F. R9120. Op. 2. Ed. khr. 248 (The report on the work of the IEiKT of the AMS of the USSR in 1946). L. 83. The deficiency of the states [in Russian].
25. *Borodulin V.I.*, *Zelenin A.V.* Vladimir Filippovich Zelenin: vremya i sud'ba (Vladimir Filippovich Zelenin: time and fate) [in Russian]. M.: MEDpress-inform. 2012.

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