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МАСТЕР И ВОЛАНД: К 120-ЛЕТИЮ СО ДНЯ РОЖДЕНИЯ АЛЕКСАНДРА ЛЕОНИДОВИЧА ЧИЖЕВСКОГО

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РЕЗЮМЕ: Историко-биографическая статья о жизни и творчестве легендарного советского мыслителя и творца А.Л. Чижевского к 120-летию со дня его рождения. Судьба универсального естествоиспытателя, изобретателя, инженера, историка, художника, поэта и философа рассматривается на фоне событий его эпохи в связи с отношением его современников, как сторонников, так и противников его концепций, — к его теориям, изобретениям и исследованиям. Трактуется проблема взаимоотношений творческих и пассионарных личностей в тоталитарном обществе. [25 рис., библиография — 91 ист.].

КЛЮЧЕВЫЕ СЛОВА: Чижевский А.Л.; гелиобиология; аэроионизация; биологические ритмы; реологические свойства крови; история медицины; космизм.

MASTER AND WOLAND: IN 120TH BIRTHDAY ANNIVERSARY OF ALEKSANDR LEONIDOVICH CHIZHEVSKY

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ABSTRACT: Historical and biographical paper about life and creative achievements of legendary Soviet polymath, A.L. Chizhevsky, for 120th anniversary of his birth. The fate of the universal natural scientist, inventor, historian, artist and thinker is examined against the backdrop of the events of his era, in connection with the attitude of his contemporaries, both proponents and opponents — to his concepts, inventions and research. The problem of interaction of creative persons and passionaries in totalitarian society is discussed. [25 figs, bibliography — 91 refs].

KEYWORDS: Chizhevsky A.L.; Tchijevsky A.L.; Heliobiology; aeroionization; biological rhythms; blood rheological properties; History of Medicine; cosmism.

«The Sun, thanks to its energy fluctuations,
troubles and periodically calms the activity of atmo-,
hydro- and biosphere; The reaction follows the action, and sooner or later
in one area there is a compensatory process,
smoothing out the sharps of the quantitative curve and aligning
it into a straight line or line expressing a course tendency
of this or that organic process on Earth.»
«The Bolsheviks did not appear because Lenin wanted it, but because
the History of Mankind entered a new era.»
A.L. Chizhevsky

Whatever problem's solution Russian mind can find, it always found a new worldview along with original intended concrete decision. The Philosophy of Cosmism inspired many fruitful Russian scientists who often have been working out of some formal restricting rules of scholarship science. They created across borders of academic areas, above social and epistemological barriers and made brilliant results in wide range of scientific themes, often combining that with contribution into arts and literature [1]. Recently we met 120th anniversary of one of the brightest scholars from this constellation.

Aleksandr Leonidivich Chizhevsky (also often spelled abroad: Tchijevsky) (February, 7th 1897, Zehanoveč, Russian Empire —

Fig. 1. Left to right: Shura Chizhevsky, his ant Olga Vasil'evna Chizhevskaya-Lesley and his father Leonid Vasil'evich Chizhevsky at home in Kaluga, 1914 [3]

December 20th, 1964, Moscow, USSR), a Soviet natural scientist, biophysicist, pathophysiologist, inventor, innovator, historian, poet, artist, engineer, and philosopher. He was one of the sunniest unique polymaths of 20th age, and historians of domestic science sometimes mention him as «the Soviet Leonardo». A.L. Chizhevsky was born in the small town of Zehanoveč, located in the Grodno Governorate, in Russian part of Poland, to the family of a Russian artillery officer. His father was Leonid Vasil'evich Chizhevsky (1861–1929), that year a captain, later — a general of Russian Army, in Soviet period — Chief of Red Army Infantry Commanders» Courses, titled in 1928 Hero of Labor of Red Army [2]. This officer (as one may suggest judging upon his successful career under extremely different regimes) was talented inventor and military scholar contributed into Ballistics (he invented special goniometer for firing from closed positions and an instrument for destroying of barbed wire fences). The father implanted into Alexander's brain an analytical engineering approach and an interest to science. His extremely rich library of books in military history later served as one of the backgrounds for son's studies in solar influence on global history cyclism. The boy lost his mother very early: Nadezhda Aleksandrovna Neviandt (1875–1898), whose family had Dutch and French roots, died from tuberculosis when her little Shura barely reached the age of one year. Therefore, Aleksandr was brought up by his father, and by his grandmother Elizaveta Semionovna Chizhevskaya-Oblachinskaya, 1828–1908 (first cousin of famous Russian admiral Pavel Stepanovich Nakhimov, 1802–1855). Largely and most of all — he was brought by his beloved ant Olga Vasil'evna Chizhevskaya-Lesley (1863–1926), a person very close to him until her last day [fig. 1].

The whole genealogy (fig. 2) of Chizhevsky's family (both by paternal and maternal lines) was related to Russian military history [3–4]. A founder of its Russian branch was a Polish count Jan Kazimierz Chizhevsky, sworn to Russian crown in XVII century, later the family gave to Russia several Cossack sergeants and colonels, as well as officers of Russian Emperor's Army, most of them served in cavalry and artillery. A remarkable person among these militaries of Chizhevsky's genus was a grand grandfather of A.L. Chizhevsky, participant of Suvorov's Italian campaign — Nikita Vasil'evich Chizhevsky (1760–1871), who lived 111 years and took part in almost 100 battles. He was a knight of the Order of

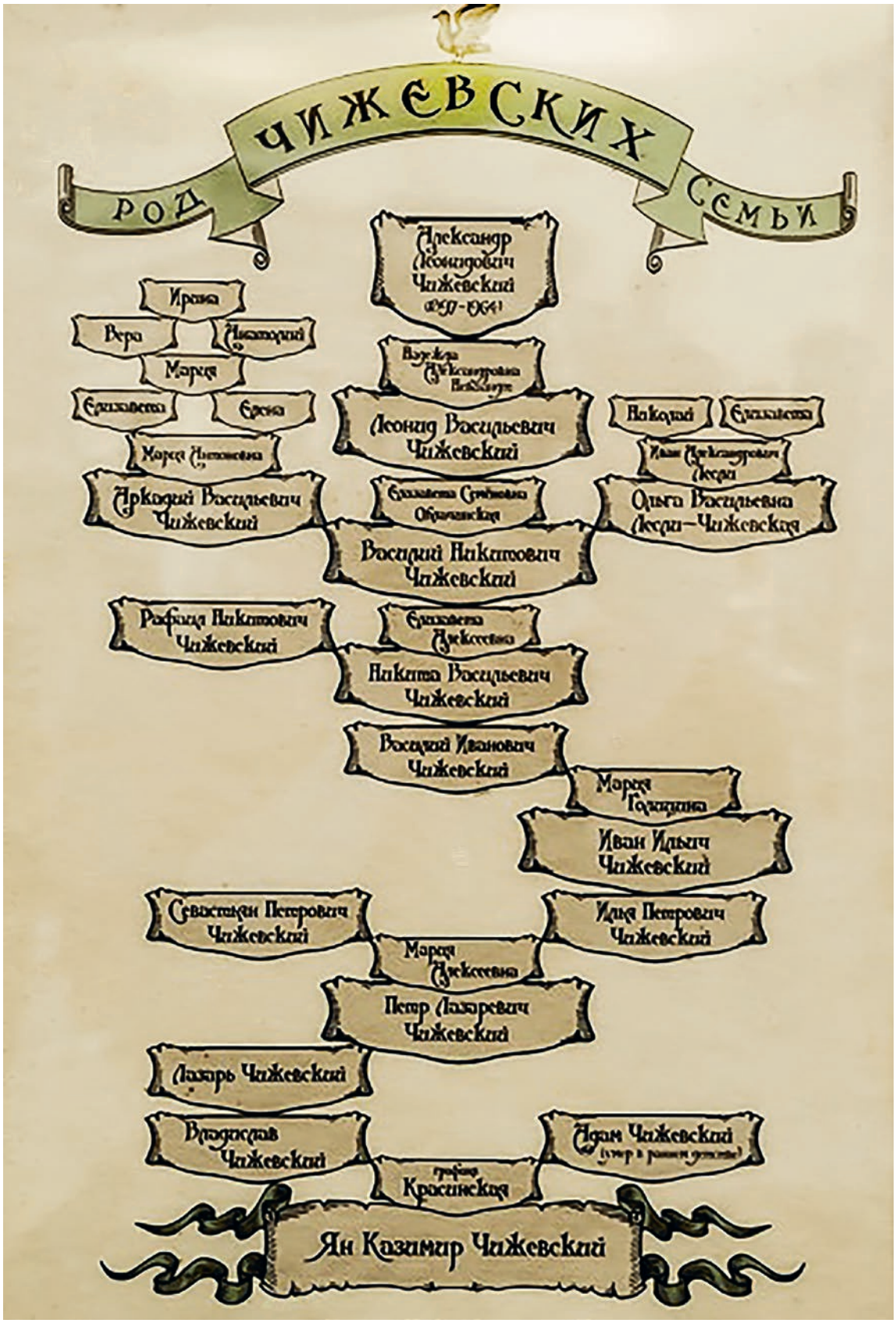

Fig. 2. Chizhevsky's family genealogical tree. From the collection of A.L. Chizhevsky's house-museum at Kaluga, photo by A. Semashko [4]

Fig. 3. Left: First teacher and scientific supervisor of A.L. Chizhevsky, Feodor Mefodievich Shakhmagonov [5]. Right: Chizhevsky's house in Kaluga, where A.L. Chizhevsky attended school (in ground floor)

Malta, and begot Aleksandr's grandfather from a French duchess he married. Among the ancestors of the scholar, we can find as well the heroes of Borodino battle and Crimean war, generals of Russian army and even a director-commandant of Tsar's Winter Palace. However, there were also people of art among the ancestors of Aleksandr: For example, Piotr Lazarevich Chizhevsky, who was a tenor singer of the court choir, first received in 1743 the hereditary Russian nobility from Empress Elizaveta Petrovna.

In spite of family martial traditions and childhood spent in travels between military garrisons, where his father served, young Aleksandr preferred civil career. He has got good domestic education, learnt in childhood four foreign languages, often visited in adolescence Italy and France (where he took lessons of painting). After many years of service in Polish cities, in 1913 his father, Colonel L.V. Chizhevsky finally took appointment to inner Russia, to the city of Kaluga and purchased there a house in 43 Ivanovskaya Street. Ground floor was engaged by school, and family lived in first floor.

Aleksandr entered Kaluga public real school, later transferred to prestigious Private real school owed by an alumnus of Moscow University — pedagogue, zoologist and physicist Feodor Mefodievich Shakhmagonov (1874–1940), where, by an occasion lucky for science, one of his lecturers episodically was the famous founder of Cosmonautics Konstantin Eduardovich Tsiolkovsky (1857–1935), who had influenced him greatly. That time K.E. Tsiolkovsky, who never graduated from a University, was unknown in scholarly community of capitols and accepted by provincial public of Kaluga just as an eccentric self-contained and self-taught inventor or even poor dreamer. Who could imagine that in 20 years (!), a teacher from Kaluga will become a classic of Cosmonautics, while all his science fiction writings and some crazy dreams will come true through the life of just one generation? After the first lecture delivered for schoolchildren, K.E. Tsiolkovsky invited them to visit his home lab and have a look on stars and planets via telescope. Only one boy came to him next Sunday. It was Aleksandr Chizhevsky [3–5]. A teacher and pupil were very close spiritually (fig. 4). K.E. Tsiolkovsky once said about his own teacher, a founder of Russian Cosmism — a philosopher and librarian Nikolay Feodorovich Feodorov (1827–1903): «As a teacher he substituted all university professors for me». Largely, K.E. Tsiolkovsky 50 years later did the same for young A.L. Chizhevsky.

In 1924, the main book by K.E. Tsiolkovsky — 2nd edition of his famous «Exploration of Outer Space by Rocket Devices» and the first monograph by A.L. Chizhevsky described his global theory: «The Physical Factors of Historical Process» were printed simultaneously on the same roll of paper purchased by Chizhevsky for local Kaluga printing house. Both brochures became later classical books of world natural science and rocketry engineering and were re-published many times in different languages, but initially were just printed per author's costs. A gifted painter, especially skillful in landscapes and watercolor, A.L. Chizhevsky partially supported their scientific and publishing activity on money obtained from buyers of his paintings (he created over 100 of them in Kaluga). He paid to printing house also his remuneration for the lectures read to workers at local fabric factory. Young Aleksandr, being familiar with Astronomy from childhood and even visited once in France well-known astronomer Nicolas Camille Flammarion (1842–1925), whose popular science books he read, in Kaluga became deeply involved in Astronomy and went farther in for solar electromagnetism under the influence of K.E. Tsiolkovsky. «*Every being shall live and think in a way as it can archive anything sooner or later*» [6], — these words by K.E. Tsiolkovsky from his article «Will of Universe» sound like said about his life and life of his younger friend — A.L. Chizhevsky.

F.M. Shakhmagonov, a provincial intellectual and polymath, natural and humanitarian scientist, also influenced young A.L. Chizhevsky greatly. When A.L. Chizhevsky graduated, together with his senior friend K.E. Tsiolkovsky he worked for short time as a teacher at the same school, headed by F.M. Shakhmagonov. A.L. Chizhevsky taught Literature and K.E. Tsiolkovsky — Physics. Chizhevsky was inspired with Tsiolkovsky's independent thinking, bravery of his scientific search, his ability to use small material funds during research process for achievement of significant results. Also, young man was impressed with Tsiolkovsky's assurance that genius researcher can create great ideas and make breakthrough in worldview of humankind even under hard circumstances of international isolation and strong pressure of dumb traditionalist elements of academic community. Geniuses unintentionally are sure of theirs own uniqueness and immortality. That is why many fillisters consider silly that great scholars make too many efforts and not think of material income or personal wellbeing achievement. Why do they waist their energy, do not concentrate on something most essential or profitable? A commoner cannot understand them…, but another mind of great potential shares their intellectual style, which was the case of A.L. Chizhevsky and K.E. Tsiolkovsky, whose friendship and scientific interaction continued until the last day of the later.

Aleksandr always was a person of very broad academic and cultural interests. He entered Moscow Higher School of Commerce (1915) and later moved to Moscow Archeological Institute (which had a preparatory class at his real school and a branch in Kaluga, established since 1911 due to enthusiasm of above mentioned F.M. Shakhmagonov), but World War I delayed educational plans of general's son. He joined the Russian armed forces as a volunteer in 1916, fought in Galicia (together with his father, who initially opposed son's will to join fighting army). After 3 months of fighting, Aleksandr was wounded and awarded The Cross of St. George, a supreme military award for a soldier in Russia. That is how it was: On September 17–19, 1916, while being a scout at the heights under a strong enemy fire, bombardier Chizhevsky corrected artillery guns via telephone communications. As a result, the enemy was knocked out of positions. For courage, heroism and self-sacrifice, by the order of the corpus commander, Aleksander Chizhevsky was awarded the St. George's Cross of the IV degree [7].

Later after new serious concussion, young soldier returned to the rear and resumed his academic studies. In 1917 he graduated

Fig. 4. Left: K.E. Tsiolkovsky in 1913 in Kaluga with his first model of metallic zeppelin. Right: a photo sent by him to A.L. Chizhevsky with hand-written dedication: «I am sending this photo to esteemed A.L. Chizhevsky in my age of 75. 3 July 1934, Kaluga, bld. 1, Tsiolkovsky street, K.E. Tsiolkovsky»). From Archives of Russian Academy of Sciences

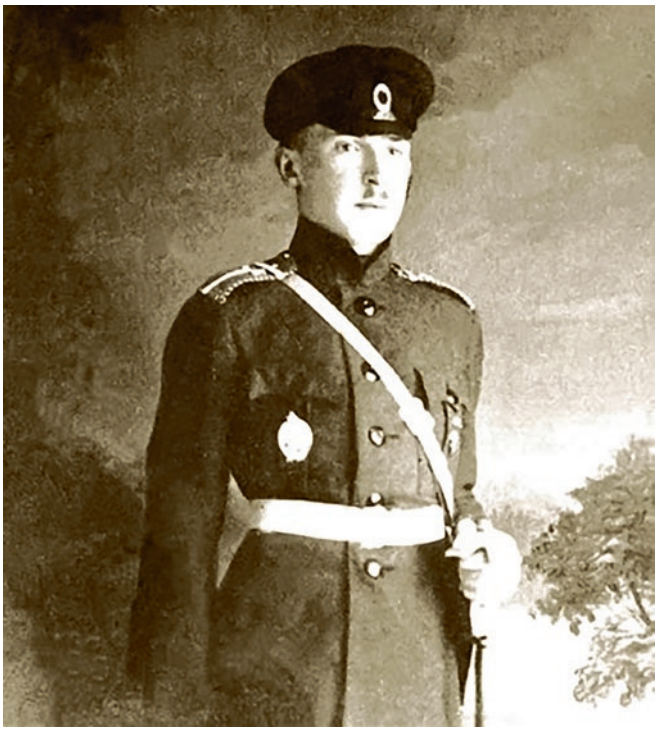

Fig. 5. A.L. Chizhevsky — volunteer of the 3rd Artillery brigade, 1916 [7]

from Moscow Archeological Institute cum laude, his graduation thesis was titled: «Russian Lyrics of XVIII century», devoted to poetry of famous polymath of that age Mikhail Vasil'evich Lomonosov (1711–1765), whose versatile personality of naturalist and poet impressed him. Aleksandr was a poet himself: In 1915–1919 he wrote dozens of original verses and poems, published in Kaluga (and achieved positive replies from outstanding poets of the epoch — Vladimir Vladimirovich Mayakovsky, 1893–1930 and Valery Yakovlevich Bryusov, 1873–1924). Posthumously this selection of verses was re-published 6 times. The same revolutionary year of 1917, but four months later, he defended M.S. Thesis in Global History: «On Evolution of the Physical and Mathematical Sciences in Ancient World». Since graduation, he worked at Moscow Archeological Institute as a senior researcher (for sure, his old teacher F.M. Shakhmagonov, who was Vice-Rector of that institution in 1918–1922 and knew Chizhevsky's potential, promoted him). In that period A.L. Chizhevsky completed his education at Moscow University (as an extern auditor, not achieved any official diplomas from that school). Initially he attended lectures at the Faculty of Natural Sciences and Mathematics, and later — at the Faculty of Medicine.

In 1915 A.L. Chizhevsky, being just a student had started his research of correlation between solar activity, infectious epidemics and social disasters (he himself called that area of studies «heliotaraxy». He matched the military events of Great War and correlated them to daily register of electromagnetic solar phenomena. While being in Galician front, he had a chance to see directly wax and wane of military events along with Sun flares. Later he interrelated the main events of global history for 2414 years with available archives of simultaneous astronomic data and concurrent heights and pauses of solar cycle. These studies led him to creation of new cosmic heliobiological theory. He stated that cosmic interplanetary movements and events, especially electromagnetic solar activity, influence much on Earth social and historical processes via biosphere dynamics, and via human biology. In modern Pathophysiology the concept of biorhythmological basis of body reactivity and theory of conditions and factors in evolving the epidemics were based on A.L. Chizhevsky's classical works. Hence, Chizhevsky concluded that not only biological, but also social and historical phenomena on the Earth are controlled by cyclic electromagnetic and radiation activity of the Sun. He is the global founder of *Heliobiology* and it was he, who personally suggested the globally accepted term «cosmic weather». In 1918, he submitted his results to Moscow University as a doctoral thesis in Global History titled: «Research in Periodicity of the Global Historical Process» [fig. 6].

The work provoked hot discussion among scholars. Although in revolutionary atmosphere of that period, several scientists supported the brave new concept. The most prominent domestic historian of that period Sergei Feodorovich Platonov (1860–1933) was an official opponent of Chizhevsky (fig. 7). He was pleased with the synthetic character of the work and with huge volume of

Fig. 6. A.L. Chizhevsky in 1918 defending his doctoral thesis [8]

Fig. 7. Pro and Contra. Left: Critical opponent of heliotaraxy K.A. Timiryazev, Right: positive opponent of Chizhevsky's thesis S.F. Platonov

materials analyzed by the applicant. A distinguished specialist in Russian History and Archeology supported the young applicant with the words: "«We are dealing with a phenomenon, which we cannot currently evaluate — so far our erudition is not sufficient enough. We see that a great, fundamental work has been done. Therefore, wishing that the descendants would not accuse us that we have missed the great discovery, we shall award the required degree». Another opponent, Corr. Member of Russian Academy of Sciences Nikolay Ivanovich Kareev (1850–1931) also gave positive review [2, 8] So, Chizhevsky successfully defended the thesis that brought him degree of Doctor of Global History, but few very respectable members of academic community, presented during the procedure of defense, categorically disagreed with author. For example, one of the outstanding biologists of that period, coryphaeus of natural science and big friend of Soviet power Kliment Arkadievich Timiryazev (1843–1920) firmly stated in regards to this thesis: «It is hard to imagine greater delirium!» [8] (fig. 7).

In 1921–22 Chizhevsky was a Professor of Archeological Institute. In 1924, he published summary of his studies and synopsis of his theory in Kaluga, in above-mentioned 1600 copies of self-funded book «The Physical Factors of Historical Process…» [9]. The idea coined by A.L. Chizhevsky was that besides obvious influence of Sun on agricultural productivity and biodiversity (which emphasized K.A. Timiryazev), electromagnetic field and some molecules in atmosphere directly ionized by solar radiation might serve as intermediates of biophysical effects of Sun activity on living beings and their relations. They could affect the health of animals and humans and virulence/pathogenicity of microbes acting on historical process via those indirect pathways (fig. 8).

In 1918–1923 Chizhevsky worked at home laboratory in Kaluga and performed decisive experiments in air gases ionization by means of original invented electromagnetic device, which had one very important ability: It produced aeroions (the term was originated by A.L. Chizhevsky), but did not generate significant amounts of ozone. Since 1923 (no longer enjoying F.M. Shakhmagonov's protection at Archeological Institute), till 1931 he was employed as an adjunct senior researcher in Laboratory of Practical Zoopsychology at so-called «Durov's corner» — a zoo facility maintained by famous circus performer and animal tamer Vladimir Leonidovich Durov (1863–1934) and very popular among Moscow people (fig. 9).

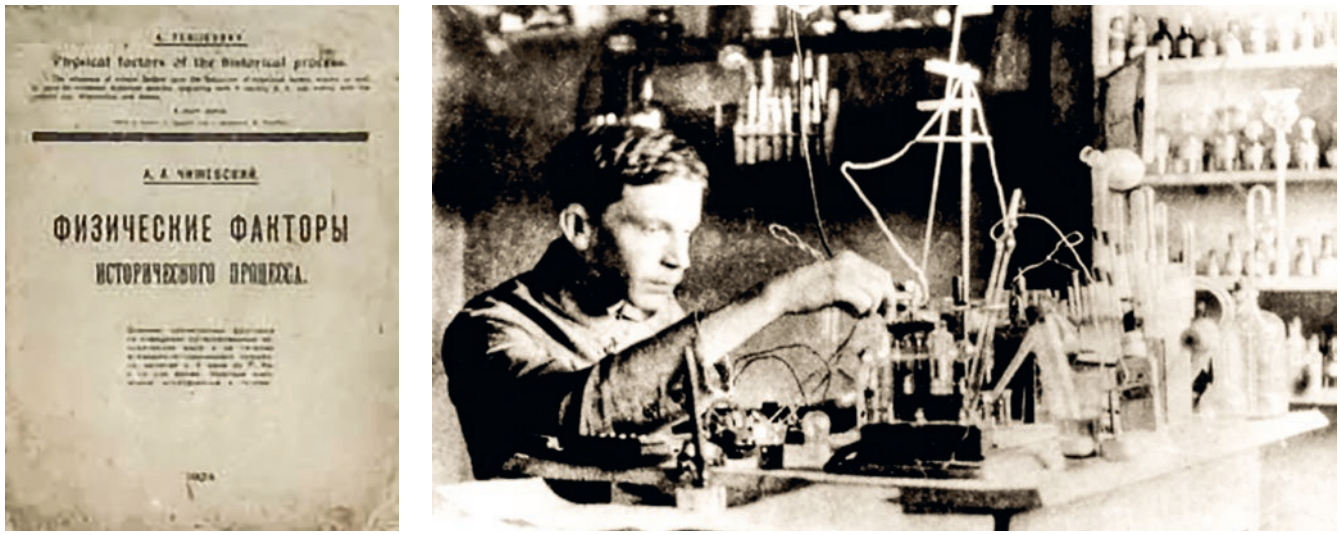

Fig. 8. Left: Cover of the 1st issue of main heliobiological book by A.L. Chizhevsky. Right: Author experimenting at home laboratory in Kaluga

Fig. 9. A.L. Chizhevsky (right) and V.L. Durov, experimenting in Laboratory of Zoopsychology (photo by A. Semashko [4])

The facility, in spite of its affiliation with Moscow circus, was very serious research and educational organization. For example, another consultant of this laboratory at the same period was Nobel Prize nominee, an outstanding psychoneurologist Vladimir Mikhailovich Bekhterev (1857–1927), with whom young A.L. Chizhevsky had academic and historical discussions. The phrase about Bolshevism in epigraph of this article is taken from their conversation [10]. A.L. Chizhevsky collaborated in early 20ies also with Institute of Biophysics, very advanced research facility, created in Moscow in 1919 by Soviet power for joint interdisciplinary studies of physicists and biomedical scholars. An outstanding biophysicist Petr Petrovich Lazarev (1878–1942) founded and headed this Institute. This globally recognized scholar, another Nobel Prize nominee and V.I. Lenin's consultant valued Chizhevsky's research very high and insisted, discussing his concepts with Chizhevsky's opponent, O.Y. Schmidt (see below)

Fig. 10. Pro and Contra. Left: P.P. Lazarev. Right: O.Y. Schmidt

that young scientist is extremely advanced, hence only the next generations, maybe people of 21st age — will entirely appreciate his legacy (fig. 10).

P.P. Lazarev was in deep chronic conflict with veteran of Agrobiology K.A. Timiryazev and his school — and what seemed to be «delirium» for later one, the former one considered the new word in science. K.E. Tsiolkovsky providentially called these experiments with aeroionization «Electronic Medicine», coining an appropriate term half a century before this branch of Medicine achieved full recognition. As early as in 1915 doctor A.S. Soloviev, a relative of A.L. Chizhevsky's father and a common guest at their family home in Kaluga, presented to Aleksandr a book by Russian hygienist, Professor of Novorossia's University in Odessa, Ivan Ivanovich Kiyanitsin (1855–1916). Kiyanitsyn, who is a scientific precursor of Chizhevsky, studied the effects of atmospheric ions on the organism, and his work impressed young Chizhevsky greatly. Aleksandr started reading on this topic and experimenting with aeroions. First results were obtained to 1919–20 and appreciated by P.P. Lazarev and S.A. Arrhenius (see below). Later, working in Zoopsychological laboratory, young scientist noticed that unipolar aeroions of opposite charge, produced by his device, influence on physiological functions of animals in reciprocal way affecting many vital functions, life expectancy, reproductivness and activity of different animals, including primates. Positive atmospheric ions made animals less active and negative ones — turned them to more excitable mode of behavior. De-ionized filtered air was deleterious for animals' health [11]. It is remarkable, that researcher registered quite simple parameters. Having no sophisticated electrophysiological and biochemical equipment, he carefully measured the amount of meal eaten; weight of daily feces produced for every animal, as well as matched their behavior and reproductive activity. Chizhevsky's works on aeroionization are awesome, he made great path from tiny amateur home experiments to uniform conception (a theory of organic electro-exchange as a part of his general geliobiological paradigm). Later he even suggested a concrete engineering solution for inculcation of his discovery in practice and in everyday life — an aeroionizer, so called Chizhevsky's chandelier or electro-effluvial device (fig. 11).

In 1923–1926 Chizhevsky collaborated with Association of Inventors, being its main expert in Biomedicine. In 1927, he completed his work on aeroionizer, and 16 September 1930 obtained a patent of the USSR # 24387 and delegated the patent rights to the Government of the USSR, in spite of personal commercial offer from Great Britain (see below). Well-known Soviet infectologist and organizer of health care, the Chief Physician of Botkin's hospital in Leningrad Gleb Aleksandrovich Ivashentsov (1883–1933) appreciated Chizhevsky's data as «highest scientific peak» and recommended broadly use the potential of aero-ionization in Preventive Medicine and Communal Hygiene (fig. 12). The first documentary film about young inventor and his discoveries was shot in 1931.

Fig. 11. Chizhevsky's chandelier — design of early 60ies [3]

Fig. 12. G.A. Ivashentsov

In that successful period of his career, A.L. Chizhevsky married Miss Irina Aleksandrovna Samsonova (around 1900? — after 1970?) and begot from her a daughter Irina, but the spouses soon divorced. Irina Chizhevskaya-Kuskova (1928–1959) inherited father's artistic talent and became cartoon painter at famous «Soyuzmultfilm» studio (fig. 13). Unfortunately, she suddenly died of complications of severe influenza. Her son, Sergei Ivanovich Kuskov (1956–2008), alumnus of Moscow State University, renowned neo-futuristic art scientist, author of more than 200 publications — was the last direct descendant of A.L. Chizhevsky [12].

The end of 20ies and first half of 30ies were most fruitful and favorable years in A.L. Chizhevsky's career of researcher and inventor. The social atmosphere in the USSR in that decade was futuristic and facilitative for science and innovations: The economics rapidly progressed, and the period of most harsh twisting nuts in science and culture was still ahead. The Soviet power invested in science and education considerable money, hence a scholar politically loyal to Soviet system could hope for substantial state support of his innovations, although only and exclusively the state officials controlled funding. At the same time, these conditions created a situation of sharp competitiveness between scientists and their groups for funds and resources, or for benevolence of those in power, which was in fact the same. In competition like that some of the scientists and organizers of research did not disdain any means, including not only the administrative resource, but even direct attempts to defame a rival in the eyes of the authorities, not only as regards to one's scientific potential, but even by hinting on obscure pre-revolutionary past and political disloyalty of an opponent. For example, a notorious campaign of persecution against Soviet geneticists, which delayed and turned back in late 30ies previous rapid progress of Genetics in the USSR, was resulted largely from skillful intrigues of one group of scientists and science administrators (like Isaac Izrailevich Present,1902–1969 and Trofim Denisovich Lysenko, 1898–1976) against another group of scholars (with Nikolay Konstantinovich Kol'tsov, 1872–1940 and Nikolai Ivanovich Vavilov, 1887–1943). It was done in a struggle for state funding. A shagreen skin-like cramping of a space for free and open discussions occurred during formation of early Soviet society, as well as transition happened from a revolutionary-initiative management model of 20ies to a bureaucratic one of 30ies. Moreover, all that changes moved the chances to win in competitions of that kind to the side of those scholars, who were less decent persons, or were less well-off under the old regime. The story of rise and fall of A.L. Chizhevsky's laboratory in that period is very emblematic. Although this scholar was originated from nobility, but not at all from the most hated groups, like landowners, orthodox clergy or capitalists. Moreover, his father became Red military and was awarded for his contribution into Red Army construction. Young Aleksandr Chizhevsky was never involved in politics during revolutions and Civil War: He spent these years in studies and research. The revolutionary character of his theories was not in contradiction with that groundbreaking historical period known for its emphatic overthrow of old idols and obsessive rejection of the past postulates. The applied benefit from his promising studies — both for industrialization and for agrarian revolution in the USSR was obvious even for the Soviet officials, in majority not possessed with scientific psychology. Therefore, Soviet power hugged him warmly, as it also appreciated above mentioned K.E. Tsiolkovsky, V.V. Mayakovsky, also Kazimir Severinovich Malewicz (1879–1935) and few other innovative scientific and artistic figures neglected by conservative old regime. Definitely, it happened because of general futuristic trend of Promethean theurgy, peculiar to early Soviet era [1]. Chizhevsky suggested that aero-ionization could improve the productivity of animal breeding and aviculture. People's Commissar of Agriculture

Fig. 13. Left: A.L. Chizhevsky's first wife Irina A. Samsonova and their daughter Irina in the middle of 30ies. Right: Chizhevsky's grandson Sergei I. Kuskov in the end of 90ies

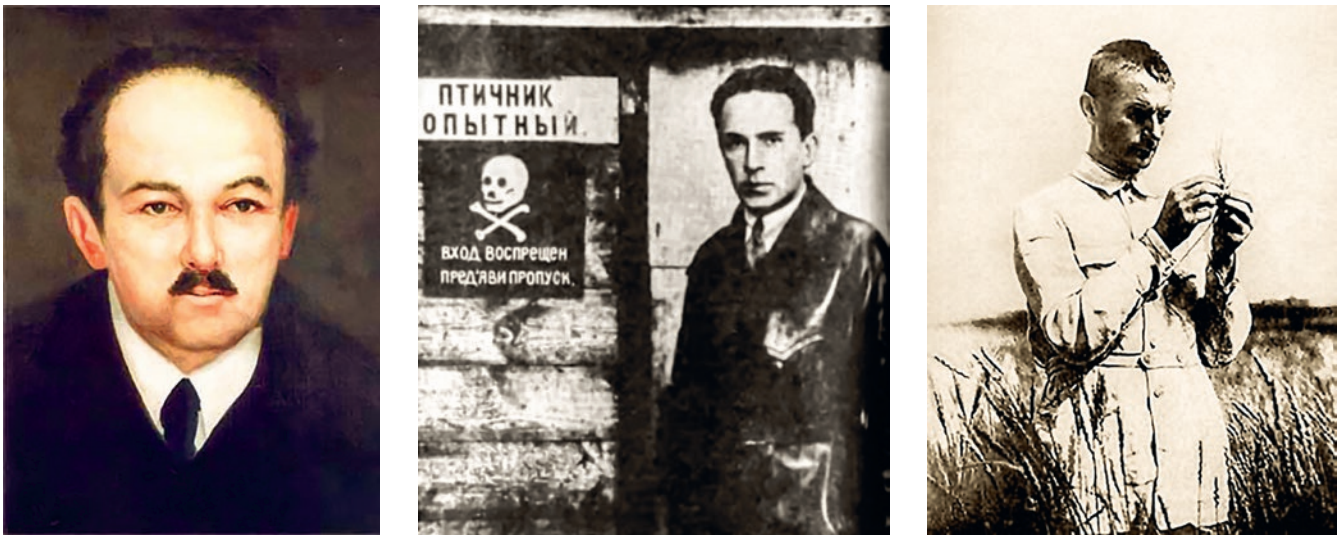

Fig. 14. Left: Y.A. Yakovlev. His protégées: Middle: A.L. Chizhevsky experimenting in poultry branch of CSRLI («Arzhanka» sovkhoz). Right: T.D. Lysenko in the wheat field, 1934

Yakov Arkadievich Yakovlev (Epstein), 1896–1938 — supported the ideas of Chizhevsky (fig. 14).

Y.A. Yakovlev was a typical figure for Soviet administration of late 20ies — early 30ies. Bolshevik-revolutionary since 1913, he graduated from the St. Petersburg Polytechnic Institute of Peter the Great and had sufficient knowledge in the technical and natural sciences to assess the potential of the proposals made by A.L. Chizhevsky. At the same time, this official was the represen-

tative of a new predatory Soviet bureaucracy, which did not regret anything for the sake of obeying the orders of higher leaders and for soonest breaking the old way of life in Russian village, with which they were neither culturally nor socially associated. It was during his work that the People's Commissar of Agriculture fell into the draconian measures to dispossess the prosperous peasants and force the collectivization of the village, with cruel struggle against the rural priesthood. He is rightfully considered one of the culprits of the Holodomor of 1932–33 stroke many Soviet territories. At the same time, a high Soviet bureaucrat of that era needed innovations and inculcations for his own career and needed to demonstrate their success. That is why Y.A. Yakovlev was interested to give way to promising and sound innovators: He did that for legendary A.L. Chizhevsky, but later the same Commissar promoted above named notorious T.D. Lysenko. It remains for us to recall the epigraph from Goethe's «Faust», which was used in that particular years and in that city by Mikhail Afanasievich Bulgakov (1891–1940) in his novel «The Master and Margarita», a panorama of that epoch: "«Say at last — who art thou?» «That Power I serve Which wills forever evil Yet does forever good.»" — answers the Demon to Faust [13]. Bright scientific minds of Bolshevist era had to accept gifts from Satan, as if Bulgakov's Master accepted the gifts from Woland. In 1931, the «Resolution of the Council of People's Commissars of the USSR on the work of prof. A.L. Chizhevsky» was decreed. Simultaneously with the decree, the Central Scientific Research Laboratory of Ionization (CSRLI) was established within the system of the Presidium of All-Union Academy of Agricultural Sciences; A.L. Chizhevsky was appointed its director and became Professor of the All-Union Research Institute of Aviculture. The laboratory had 7 branches, with a central base in Voronezh, employed about 50 researchers in 5 cities, and conducted extensive research according the A.L. Chizhevsky's programme on air ionization for animal breeding, on the electricalization of seeds in order to improve harvests, and on the study of the effects of air ions on humans for physiotherapy of diseases. Last trend developed in collaboration with the Voronezh Medical Institute, one of the leading in the country, especially eminent in surgical disciplines and Pharmacology (in fact, evacuated to Voronezh in 1919 by the Faculty of Medicine of the University of Dörpat). Several

Fig. 15. Early promoters of A.L. Chizhevsky's studies abroad: Left — L.B. Krasin, right — S.A. Arrhenius (photo with autograph)

most important applied articles, invention priority papers and one fundamental monograph relating solar cycles and epidemics — were issued by A.L. Chizhevsky in 1930–31 [14–18]. His social and material status drastically improved, he was awarded with two prestigious Prizes — from the Agricultural People's Commissariat and from the Soviet of People's Commissars of the USSR and changed his small 8 m^2 room in a modest Moscow communal flat for three-roomed apartment in the center of the city (bld 8, Tverskoi boulevard). In 1931 Aleksandr Leonidovich married for the second time. Tatiana Sergeevna Roschina-Tolstaya (Pereletskaya), 1900–1964, an actress of the Maly Theatre and a secretary at «Durov's corner», became his spouse. He adopted her daughter of first marriage — Marina (1922–1996). They had no other children.

To report the results of CSRLI studies, four volumes with proceedings of laboratory were prepared, three of them published in Voronezh [19] and partially translated abroad.

International recognition came to the scholar. A.L. Chizhevsky always was very communicable person and fluently spoke five European languages. He paid much attention to global academic contacts and promotion of his concepts among world scholarly community. As early as in 1919, after his first presentation of the research on aeroions to Kaluga Society of Naturalists, he translated his paper and sent it through Soviet diplomat, engineer and inventor, a futuristic thinker Leonid Borisovich Krasin (1870–1926) to Swedish Nobel Prize winner Svante August Arrhenius (1859–1927).

The author of electrolytic dissociation theory highly appreciated the results obtained by the young scientist, he foresaw their potential importance for science and technology, and sent a warm reply letter to A.L. Chizhevsky in May 1920. He often cited A.L. Chizhevsky, and helped broad foreign recognition of his theory. Moreover, in hard times of early 20ies Swedish scientist assisted A.L. Chizhevsky distantly, sending to Kaluga some equipment and material aid [10]. He invited young Russian colleague to a one-year internship in his laboratory at Stockholm, but despite the efforts of A.L. Chizhevsky and P.P. Lazarev and even in spite of support of the famous writer, Nobel Prize nominee Aleksey Maksimovich Gor'ky (1868–1936) and the People's Commissar for Education, Anatoliy Vasil'evich Lunacharsky (1875–1933), final-

Fig. 16. French proponents of A.L. Chizhevsky's ideas: Left — J.-A. d'Arsonval, right — R.H. Dubois

ly, the government did not allow travel abroad, although initially permission was given. The sudden change in governmental decision was caused by painful reaction of Bolshevist leaders on the recent insidious act of a poet Konstantin Dmitrievich Balmont (1867–1942), who, having received permission to travel abroad, swore publicly in love of Soviet power, but just crossed the Estonian border he gathered a rally in which he cursed the Bolsheviks. Premier of Soviet government Vladimir Il'ich Lenin (1870–1924), who trusted to K.D. Balmont because of anti-tsarist position of poet in pre-revolutionary years, was personally offended, and the system became more suspicious towards intellectuals wishing to represent USSR abroad [11]. In 1921 A.L. Chizhevsky submitted to state academic publishers his comprehensive manuscript titled: «Morphogenesis and evolution from the standpoint of electron theory», but in spite of 4 positive reviews, including those by eminent biophysicist P.P. Lazarev and outstanding geneticist N.K. Kol'tsov, it was rejected (although in polite formulations) by the director of publishing house — a geographer, astronomer and polar researcher Otto Yulievich Schmidt (1891–1956) — see above [20]. Nevertheless, A.L. Chizhevsky exchanged papers with several outstanding physical and biomedical scientists of Europe (besides S.A. Arrhenius these were Nobel Prize winner quantum physicist Max Plank (1858–1947), Nobel Prize winner, discoverer of anaphylaxis, pathophysiologist and esotericist Charles Richet (1850–1935), pioneer of Biophyscs and Physiotherapy Jacques-Arséne d'Arsonval (1851–1940) and founder of bioluminescence doctrine Raphael Horace Dubois (1849–1929). The last two especially facilitated with their authority the spread of A.L. Chizhevsky's concepts among francophone part of academic community (fig. 16).

A.L. Chizhevsky's papers of 1924–1936 on aeroionization and its biological effects and on Heliobiology were translated by author and foreign publishers and published in peer-reviewed academic journals and scholarly publishers worldwide — in Italy and France, Tunisia and Sweden, Portugal and Belgium, Germany, Mexico and USA, much broader than at his home country. The most important of them are listed in references [21–48], but totally between 1926 and 1940 he published abroad at least 65 papers. In 1929 he was elected full member (academician) of the Toulon Academy of Var, a prestigious society of best representatives of sciences and arts of this French department (physicist A.M. Ampèr, surgeon D.-J. Larrey, inventor of cinematography L. Lumière and many other outstanding figures also were members of this Academy). In December 1926 his main brochure on heliotaraxy «Physical factors of the historical process» was translated into English by an American geologist of Russian origin Vladimir P. de Smitt and presented to annual conference of American Meteorological Society [24]. In the end of 20ies several French scientific and medical societies elected him as a full member or honoris causa member. Later in 30ies he was elected as a member of academic societies and editorial boards of scholarly journals as well as co-chairperson of international congresses in Germany, Benelux countries, Mexico, Portugal and Brazil, as well as Corresponding Member of Columbian Academy of Science in Bogotá (fig. 17).

However, Woland in power did not let his Master travel abroad, in spite of many invitations. Several leading North American universities (Columbian, Princeton, Yale, Harvard), as well as American Medical Association, Trudeau Tuberculosis Institute and few other medical and research organizations across the ocean have noticed Chizhevsky's publications and were interested in his method. Twice they sent emissaries to Soviet Russia in order to share Soviet scholar's experience and invited him as guest lecturer. Alas, he never travelled abroad, just sent his papers. Through the news agency, Associated Press the broad circles of readers in the USA met with a popular version of Chizhevsky's concepts. In Great Britain, however, Chizhevsky's publications encountered criticism from some physicists of Ernest Rutherford's school, although the head of this school finally personally invited him to be a member of organizing committee of International Congress in Physical Medicine, so Chizhevsky published his next article in its proceedings [11]. People's Commissar of Health in 1918–30, Nikolay Aleksandrovich Semashko (1874–1949) (fig. 18) sympathized with Chizhevsky's concepts, edited his works and published Chizhevsky's papers (1927-28) in his Russian-German medical journal at Berlin, which further strengthened the authority of Soviet scientist abroad [22, 25–27].

At the same time, within the USSR clouds thickened over the laboratory headed by A.L. Chizhevsky. In fact, it lost the canopy of its administrative patronage. The People's Commissar of Agriculture Y.A. Yakovlev was accused of violation of Party's rout during collectivization and arrested. The investigation of his activities provoked inspections in all structures patronized by him, including CSRLI. Moreover, several above mentioned prompting scientists and public figures who sympathized with the ideas of Chizhevsky (Semashko, Tsiolkovsky, Lazarev, Platonov, Kareev, Krasin, Lunacharsky, Durov, Ivashentsov) — to the middle of 30ies one after another went off stage of public activity or even died….

Fig. 17. Foreign Certificates of Honor conferred upon A.L. Chizhevsky. Photo by A. Semashko [4]

Fig. 18. A proponent of A.L. Chizhevsky's ideas — N.A. Semashko

On this background the attacks from envious part of scholarly community, which previously were refuted, became more dangerous. Envy is a great factor in human development, although very often negative one by its overall effect. The aggressive and envious competitors of Chizhevsky were brothers Zavadovsky Boris Mikhailovich (1895–1951) and Mikhail Mikhailovich (1891–1957). The biographers of Chizhevsky, especially those of late 80ies and 90ies, sometimes painted their portraits in black tones exclusively, exaggerating their negative characteristics and presenting them as pseudo-scholars, which obviously was not the truth. Both Boris and Mikhail (fig. 19) were quite serious scientists with some considerable achievements and even with priority in some aspects of Zoology and other branches of Biology and applied cattle breeding.

It is enough to mention that B.M. Zavadovsky was one of the pioneers of Endocrinology in animal breeding and authored priority experimental studies on the role of thyroid gland in animal behavior (1919). His elder brother M.M. Zavadovsky was a pupil of the outstanding geneticist N.K. Kol'tsov. M. M. was gifted systemic biologist who first coined the term «Biotechnology» (1932), which later entered into broad global use. In addition, he authored the breakthrough article of 1933, where he developed a concept of «plus-minus interactions» — one of the earliest known formulations of servomechanism principle in pituitary control of peripheral endocrine glands and obviously one of the first founding stones into basis of Biocybernetics [49–50]. Both brothers insisted that it is possible to increase the productivity in future Soviet livestock production by means of artificial endocrine influences on agricultural animals. Candidly speaking, nowadays, 90 years after their statements we can see that it was successfully done, and hormonal methods really were and still are accepted worldwide! Another matter is a quality of animal products obtained from such hormonally treated domestic animals. Nevertheless, it was the rivalry for big investments and the precariousness of their own

Fig. 19. Opponents of A.L. Chizhevsky: Left — B.M. Zavadovsky, right — M.M. Zavadovsky

situation in the face of a system inclined to punish «the remnants of the old regime», which made them hostile to A.L. Chizhevsky [11, 51]. Also one need to bear in mind the specific cultural and educational level of those to whom the system entrusted to be supreme judges in scholarly disputes — all that circumstances prompted the brothers not to disdain with any means of struggle. For Zavadovsky brothers A.L. Chizhevsky was a direct competitor conflicting for funds and benevolence of Soviet leaders of agriculture. To 1930, the experimental zoological laboratory created by M.M. Zavadovsky at Moscow Zoo (from the very beginning alternative to Durov's corner lab, where A.L. Chizhevsky worked) was joint to the same system of applied agricultural science, as the A.L. Chizhevsky's CSRLI. Moreover, the biographies of the brothers, sons of a reach landowner and priest's daughter hardly were better credentials for them, than the biography of the son of a Red military A.L. Chizhevsky. That is why brothers decided to attack, not waiting until A.L. Chizhevsky's lab would gain more results that are promising. Therefore, B. M. as a director the All-Union Institute of Animal Breeding organized the first assaults on new laboratory few months after its opening — in March and September of 1932. The opponents, including a physiotherapist Mikhail M. Anikin, an enthusiast of ozone therapy, insisted that all positive effects of Chizhevsky's chandelier could be explained by banal ozone production known for a long time, so they are devoid of novelty [10–11, 51–53]. B.M. Zavadovsky, as Chizhevsky later reminded in his memoir books, used during discussions not only scientific, but also political arguments, attacking author for his earlier non-Marxist publications about solar control over historical process and even reminding the word «God» written with a capital letter «G» in the verses published by young Aleksandr Chizhevsky! [10]

A.L. Chizhevsky, however managed to prove that ozone was absent among the acting factors of his aeroionization, where leading role belonged to oxygen-containing anions. First attacks were repelled due to reference to recent encouraging decree of Soviet Government (issued in April 1932) about the works by Prof. Chizhevsky.

Than B.M. Zavadovsky (who entered All-Union Communist Party of Bolsheviks in the same 1932) used «heavy artillery»: On the wave of campaign against recently arrested protector of A.L. Chizhevsky's lab ex-People's Commissar Y.A. Yakovlev, he wrote in 1935 an anti-Chizhevsky letters to central body of Bolshevist party — a newspaper «Pravda». The titles of papers were very offensive: «Against the scientific trash» and later «An Enemy under the Mask of a Scholar». He not only accused A.L. Chizhevsky in lack of competence in natural science, dilettantism and jumping to instant conclusions without appropriate experimental data, but also portrayed him as enemy of Soviet power; showed him as a part of the Yakovlev's group of recently revealed pests of the socialist reorganization of agriculture, which was in fact a direct deceitful denunciation [10–11, 51–54]. By the way, the irony of fate is that B.M. Zavadovsky himself, although eventually won over A.L. Chizhevsky «victory» in 1934–37, ousting him away from Woland's friendly hug, just few years later was also accused of secret sympathy for Genetics and in a mortal sin of «departure from K.A. Timiryazev's and I.V. Michurin's teachings». He was criticized by above mentioned T.D. Lysenko and I.I. Present in formulations, almost identical to his own criticism on A.L. Chizhevsky, and removed from all official posts (1948) [55]. Woland does not keep eternal sympathy for one or another of the Masters...

To the moment of that attack on CRSLI creative activity of A.L. Chizhevsky already gave some very important fundamental and practical results. On 29 August 1932, he published together with a close co-worker from CSRLI — a biophysicist Leonid Leonidovich Vasil'ev (1891–1966) — a pioneering paper on the electrical properties of moving blood and showed the importance of electric charge for its rheological properties (volume issued in 1933) [56]. In fact, A.L. Chizhevsky and L.L. Vasil'ev were the first to carry out research of the electromagnetic properties of erythrocytes in circulating blood. Chizhevsky continued these studies later (being in GULAG and exiled) — and demonstrated that these properties support some dynamic structure of the normal laminar blood flow. Therefore, he is a pioneer in Biophysics of microcirculation: He suggested an explanation for the mechanisms of «rouleau» formation and other pre-static phenomena in microcirculatory bed, which is still in broad use for the erythrocyte sedimentation rate (ESR) test everywhere. Interestingly, his co-author L.L. Vasil'ev (fig. 20), alumnus of Petrograd University, later on studied biophysical basis of psychophysiological phenomena and conducted pioneering scientific research in telepathy, started in late 20ies together with A.L. Chizhevsky. L.L. Vasil'ev became renown scholar, collaborated with applied military science and also achieved a publicity of gifted popular science writer. Although his works in Parapsychology were severely criticized by the orthodox representatives of so-called «Pavlovian neurism», he was elected Corresponding Member of the Soviet Academy of Medical Sciences.

The early 30ies were characterized by broad interest to science and innovations, the creative energy of Soviet people displayed very brightly. In those years talented amateur researchers and enthusiastic inventors who worked outside the officially recognized science, were drawn to the well-known and successful examples of A.L. Chizhevsky and K.E. Tsiolkovsky, they wrote letters in search of support from self-taught people who overcame the distrust of academic circles. A similar letter A.L. Chizhevsky received from the Kazan physician and bacteriologist Sergei Timofeevich Vel'hover (1887–1942), who was impressed by his heliobiological concept. S.T. Vel'hover obtained data about cyclic metachromasy in bacteria, related to phases of solar electromagnetic activity and able to alter pathogenicity of Corynebacteria and other microorganisms. A.L. Chizhevsky supported these studies and in fact was their scientific supervisor. He made a decisive contribution to the conceptual interpretation of Vel'hover's discovery, inspired him by his theory of the «earthly echo of solar storms» and attributed this phenomenon a great conceptual significance, since he saw in microorganisms one of the bridges between the solar activity and processes in the biosphere, affecting the fate of

Fig. 20. The researchers, attracted and inspired by A.L. Chizhevsky, co-authors of his discoveries: Left — L.L. Vasil'ev [57], right — S.T. Vel'hover [58]

mankind, for example, epidemics. The phenomenon is still known in world science as Chizhevsky — Vel'hover effect [58].

In the end of 1932 Chizhevsky patented a new method of electocolorization by means of sedimentation of ionized particles of dye on metallic objects [18]. The patents for electrostatic crushing of liquids (1932) and later (1938) — for electrostatic spray painting method — were purchased from the USSR and implemented by car industry. In fact, millions of cars worldwide are still painted according the modifications of method originally invented by A.L. Chizhevsky [11]. Another applied result of his studies in aeroionization was a new method of electric high-voltage defrosting for aviation (patent pending of 1937). It turned out that aeroionization also can precipitate dust and microorganisms from the air, which made it possible to use aeroionizers as a new means of air conditioning and was used during the construction of the Moscow metro (patent pending of 1938) [2, 10–11, 51–52].

Nevertheless, the assault from B.M. Zavadovsky and other opponents was serious, moreover, some positions of CSRLI looked fragile. A.L. Chizhevsky never graduated from any professional school of natural science. He was genius producer of fruitful ideas and concepts, bright humanitarian scholar, paradoxical inventive engineering mind, talented popularizer of science capable of capturing people. He had a good command of social technologies to achieve the publicity of his research. At the same time, he definitely was not qualified scientific administrator. The routine scientific work in several remote spots joined under the name of his CSRLI was partially out of his everyday control. Some employees kept animals and conducted observations at home; their protocols were far from high standards of academic science [53–54, 59].

The government created in 1934 a commission for the evaluation of the works in CSRLI in order to check the foundations of criticism from B.M. Zavadovsky. The members of commission were 15 scholars representing Agricultural Sciences, Biology, Physics and Medicine. The scientific reputation of them was quite high, especially as regards to several members, like leading Soviet physiologist of late 30ies Ivan Petrovich Razenkov (1888–1954) and world famous physicist Abram Fyodorovich Joffe (1880–1960). They were the chairpersons of the commission in different periods of its function.

Some modern historians of science, like E.S. Levina [53–54], insist that the result of the work of that commission finally could be much more favorable for A.L. Chizhevsky and his laboratory, than it actually turned out. At least, only 8 out of 15 members of commission voted for negative conclusion and supported A.L. Chizhevsky's dismissal. Perhaps, if the head of laboratory preferred another strategy of defense, it could turn other way. E.S. Levina writes: «*The analysis of the materials makes it possible to suggest that the reason for the unrealized outcome of A.L. Chizhevsky's research programme during his life should be considered not only the social background of the period of the first socialist construction five-year plans, or the tragic circumstances of his personal fate (as it is commonly believed), but also the completely objective difficulties in achieving mutual understanding and effective cooperation for solving the most complicated interdisciplinary research, which were not overcome by the programme manager — director of CS-*

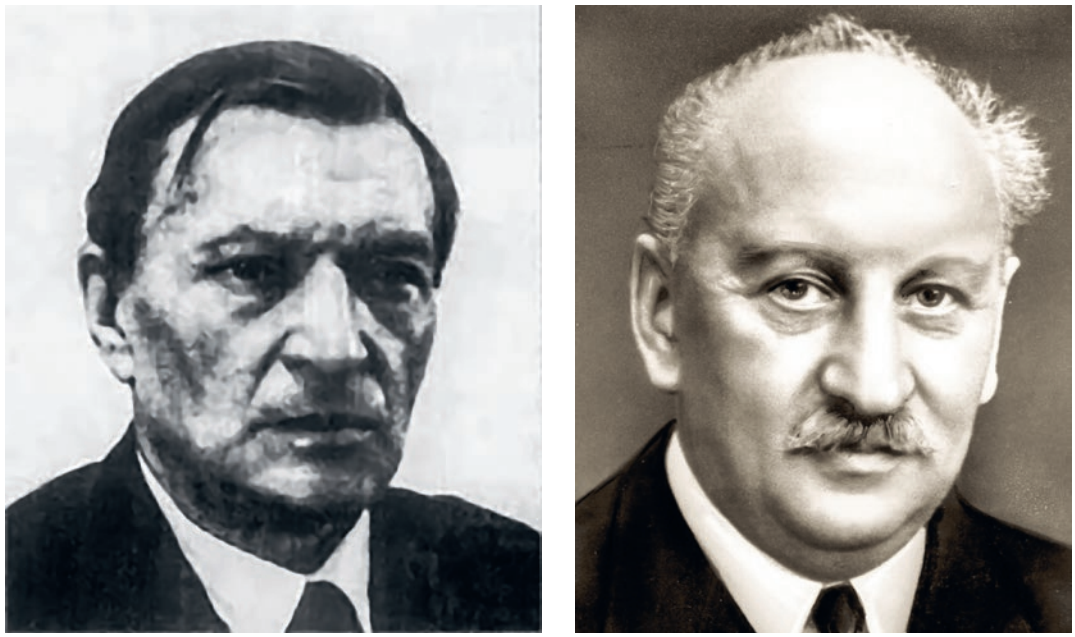

Fig. 21. Investigators of CSRLI activities: Left — I.P. Razenkov, right — A.F. Joffe

RLI A.L. Chizhevsky. The position taken by Chizhevsky in this conflict looks erroneous. Not trusting the commission, he completely avoided scientific discussions, refusing to participate in the meetings despite repeated invitations and even demands to appear. At the same time, judging by the surviving transcripts and letters to him from the lab employees (actually left to their fate!), there were scientists sympathizing to the Laboratory in the commission, and the situation did not seem hopeless at all…. Essentially, the author of the idea of aeroionization made it easier for his pogrom makers, delaying the implementation of his scientific programme for a long time» [53]. A.L. Chizhevsky was much closer to noble standards of classic scholarly community, than many of his opponents, which formally belonged to refined professional scholars. That is why he abstained from political arguments in early phase of discussions, unlike many of his attackers. After first Zavadovsky's accusations in anti-Marxist historical positions, he even published in «Pravda» a letter with self-criticism of his own heliotaraxy theory and with renunciation of the leading role of the Sun in the history of society (17 January1932) [11, 51–52]. That was a cessation of Master to Woland, understandable in atmosphere of total ideological dictate and fear. Nevertheless, maybe Master felt that manuscripts do not burn? However, in foreign literature he still published in that period papers based on theory of heliotaraxy, e. g. [44–48], so his opponents have got and gladly used the motive to accuse him of insincerity and double-dealing, if not in the betrayal of the socialist homeland. Moreover, later, in the decisive moment of polemics with the commission, Master accepted the rules of Woland's game... A.L. Chizhevsky did not attempt to convince his opponents by scientific discussion. Perhaps, he did not rely upon their objectiveness. Instead, he published in «Pravda» a letter titled: «Reply to the angry opponent» and wrote several letters to Council of People's Commissars, to Committee of Party Control, to Supreme Council of the USSR (with the help of extremely popular social figure, People's Deputy, the Hero of Soviet Union polar pilot Mikhail Vasil'evich Vodopianov, 1899–1980). B.M. Zavadovsky responded with third article of 30 June 1936 in «Pravda» titled «The Immense Arrogance of the Pseudo-Professor Chizhevsky» [11, 51–52]. Then, A.L. Chizhevsky in his letter of 1938, addressed to the executioners (the People's Commissar of Internal Affairs, N.I. Yezhov and the USSR Prosecutor General A.Ya. Vyshinsky, whose names sound odiously for contemporary readers). A.L. Chizhevsky, trying to hit opponents with their own weapons, affiliated the members of commission, checking the work of his laboratory, with the name of imprisoned and shot ex-People's Commissar of Agriculture M.A. Chernov (1891–1938), who signed on 7 July 1936 the decision of CSRLI closure. A.L. Chizhevsky wrote «*I ask and strongly insist that a serious investigation be assigned to my case, and the perpetrators — the accomplices of Chernov and C°in solidarity with his acts of sabotage, for bringing false information to the Government of the USSR were brought to severe judicial responsibility*» [54]. However, Master had not enough of mastership in the field of Woland's games. Final point in evaluation of CSRLI put A.F. Joffe. The eminent physicist (most probably, irritated and worried with counter-attacks from Chizhevsky against decisions of commission), in May 1940 wrote a letter to government in order to confirm negative conclusions of the commission, announced a month earlier, but still discussed. He wrote (also in that typical Woland's style of epoch): «*Prof. Chizhevsky does not possess either knowledge of Physics or a knowledge of the fundamentals of Biology, as a result of which his leadership of the laboratory results in completely incorrect formulation of experiments that ensure their results in advance. In the public rela-*

tion prof. Chizhevsky is a figure that dishonors the community of Soviet scientists. Shameless self-advertisement, illiteracy and scientific dishonesty, appropriation of other people's achievements, Khlestakovism — these are the features that determine the career of prof. Chizhevsky. The senseless and ideologically harmful «theory» that revolutions, epidemics among mankind and animals, people's movements — are determined by sunspots, brought to prof. Chizhevsky unenviable popularity in the reactionary circles of France, where he published these «studies». Along with these outrageous and harmful features of the «scientific» activity of prof. Chizhevsky, the commission could not find any useful result or even a hope for a successful future result of the work at prof. Chizhevsky's laboratory. Therefore, I consider the proposal of the commission to eliminate prof. Chizhevsky from the scientific leadership, the closure of practical experiments with zero result and the concentration of works on the effects of ions on the body in those biological laboratories working under serious scientific guidance» [54, 59]. Nowadays, 77 years later, appreciating both these great scholars, we can just say that Woland could very skillfully manipulate the Masters, separating them and inciting against each other.

The CSRLI was closed, but «collective Woland» did not apply any severe sanctions against the disgraced Chizhevsky. Moreover, the value of his applied inventions was not put under any doubts: In 1938 he was officially invited to work as a leading scientist of the «Aeroionification lab», group of scientists and engineers, involved in communal hygienic part of the very ambitious state financed project. It was construction of the huge «Palace of Soviets» in the centre of Moscow. The unique building, a fruit of international architectural contest, future heart of Soviet democracy had to be equipped with Chizhevsky's chandeliers and use electroionization for air conditioning. The Palace (fig. 22) promised to be the highest building on the Earth (495 m). On the top of the Palace there should be the statue of V.I. Lenin of 100 m height by leading Soviet sculptor-monumentalist Sergei Dmitrievich Merkurov (1881–1952), who made Lenin's post mortem mask and the largest monuments to I.V. Stalin in history. A.L. Chizhevsky was in friendship with this Master, and Merkurov recommended to employ him in the team of the project [60]. Vice-Director of the project was G.B. Krasin — brother of above mentioned L.B. Krasin, familiar with A.L. Chizevsky's works since early 20ies. He also supported his employment.

Fig. 22. The general view of the Palace of Soviets according architectural project by B.M. Iofan et al.

To make a Master working hard under constant fear, that was another Woland's trick. The project by winners of competition, renown architects B.M. Iofan, V.A. Schuko and V.G. Gelfreich was very advanced technologically and pretty futuristic. It was not surprising that futurist A.L. Chizhevsky joined this team with enthusiasm. In addition, during 1938–1941 part time he worked at the Department of General and Experimental Hygiene of the 3rd Moscow State Medical Institute and in Leningrad State Pedagogical Institute. He wrote in Moscow and in 1938 published in Paris one of his main monographs, which will be issued in Russian only much later, posthumously and under different title [61–62]. This episode closely resembles the Bulgakov's Master and his novel, written secretly [12], so V. Basha even compared A.L. Chizhevsky and Bulgakov's hero in her article about Soviet scholar [60]. In 1939, A.L. Chizhevsky reached the apotheosis of his international recognition. On 11–16 September 1939 he was elected Honorary President of the 1st World Congress in Biophysics and Cosmic Biology in New York (in absentia). The Congress adopted special memorandum about his scientific merits, legacy and global priority in several fields and nominated him for the Nobel Prize, although officially, according the Nobel Prize charter a congress like that had not the right of direct Nobel nomination. In the memorandum, the scholars (among them was father of Biophysics — J.-A. D'Arsonval) postulated «*Due to the genuinely novel ideas, the breadth of coverage, the courage of synthesis and depth of analysis, the works by Professor Chizhevsky put him at the head of the biophysicists of the world and made him the true Citizen of the world, for his works are the property of Mankind».* Congress emphasized that the scientist's multifaceted activities personify *«for us, living in the 20th century, the monumental personality of Leonardo da Vinci*» [2, 11]. Alas, that hardly was a stronger criterion of scholar's value for domestic administrators of science then the ideological loyalty.

On 22 June 1941, Nazis attacked the Soviet Union. The works related to construction of the Palace of Soviets stopped (and later its fundament and carcasses demolished for military needs). In November enemy approached to Moscow. The Maly Theatre, where Chizhevsky's wife worked, had to evacuate to Urals. A.L. Chizhevsky who already suffered in his age of 44 from the ischemic heart disease and was not as good soldier, as in his heroic youth of a St. George's Cross Cavalier, also was evacuated with her. On the way to Chelyabinsk in a train, he committed a fatal carelessness, which changed his entire subsequent life. That was a talk to occasional travel companions (one of them was a homoeopathist, who earlier helped him with

Fig. 23. Watercolor paint by A.L. Chizhevsky with Ural landscape and his autograph, created in Ivdel'lag, 1944 [66]

a brochure publication). The catastrophe happened because of one phrase pronounced by A.L. Chizhevsky while train passing by a small station with an anti-Nazi slogan on the fronton of its railroad terminal. The slogan was «Kill a German!», which provoked A.L. Chizhevsky for a loud note that «Not every German is an enemy, it's a nation of high culture». That was enough for two denunciations, but that papers did not have any immediate consequences. Soon after arrival to Chelyabinsk, where he employed as a scientific consultant of Regional Hospital, administration supplied spouses Chizhevsky with a good large apartment. They kindly decided to share it with a homoeopathist doctor, also evacuated from Moscow and travelled in the same train. That particular person after several months of living with Chizhevskys submitted the third denunciation against scholar with a fantastic description of A.L. Chizhevsky signaling to German airplanes at the railroad station of Schelykovo [60].

On 21 January 1942 A.L. Chizhevsky was arrested and falsely accused of anti-Soviet conspiracy and pro-Nazi agitation. On 13 March 1943 he was sentenced for 10 years and in fact imprisoned for 8 years, and later exiled for another 8 years. First, since 29 August 1943 he was in North Urals (at Ivdel'lag), then after a short stay in so-called «sharashka» — a privileged closed research lab for imprisoned scientists at Kuchino near Moscow (1944-45), were he studied new methods of wound treatment with aero-ions, Chizhevsky returned to the remote giant camp of Karlag in Kazakhstan. In spite of terrible circumstances, the scholar continued his struggle for life and for ability to create: He tried to get elementary conditions for scientific work, risking violating regime and irritating camp administration with his letters, and finally was lucky to have some help from a deputy-chief of his camp, Lieutenant-Colonel Aleksandr Leonidovich Slyusarenko, who respected imprisoned «namesake-academician», returned his books, sent his papers to Moscow and even allowed him to live separately from other prisoners in a small room. Fortunately, medical knowledge helped «prisoner # SG555» to survive: He was able to get a job in the camp medical facility and even do some research in the field of hematology. A.L. Chizhevsky made in prison and exile several innovations, for example electric filter-mask for the protection of miners and a method for concrete amelioration based on aeroionization technology. This period of his life is described in details by several biographers we cited above [63–65]. He wrote during 15 years many verses (published posthumously and not in full) and painted several hundred of pictures and drawings (exhibited also posthumously) [66–67] (fig. 23).

When A.L. Chizhevsky's sentence elapsed, he continued his research being exiled on 7 January 1950 to Karaganda (Kazakhstan) on settlement, far away from the main academic centers. He devoted this period to studies in flow structure of moving blood (together with mathematicians P.G. Tikhonov and G.N. Perlatov, whom both he met in prison) and after liberation in 1954 even asked officially to prolong the term of his exile «because the programme of local research has not yet been com-

Fig. 24. A.L. Chizhevsky during microscopic studies in Karlag (1949) [66]

pleted». Between 1950 and 1958 he published a cycle of papers in peer reviewed medical journals devoted to electric properties of circulating blood [68–73].

A.L. Chizhevsky [fig. 24] tried to use electric properties of blood in diagnosis, including early cancer reveal, studied their age dependence. Also he insisted on importance of restore of electric properties of conserved blood and made significant contribution into studies of pre-static phenomena pathogenesis. In Karaganda he worked as a consultant on aeroionotherapy [74] and head of the laboratory of blood structural analysis and dynamic hematology in the Karaganda Regional Clinical Hospital, also he employed at the laboratory of the Karaganda Regional Blood Transfusion Station, and until 1955 collaborated with clinical laboratory of Karaganda Regional Oncological Dispensary. In plus he worked as a senior research scientist at the Karaganda Coal Research Institute. In 1958, Chizhevsky returned to Moscow where he published several books on aeroionification of buildings and on blood Biophysics, based on previous studies [75–77]. Almost all his archive was fortunately saved, but not his former apartment. He lived with his wife in «Moscow» hotel, having no flat until 1963. In 1962, he was rehabilitated, but partially: Soviet power still did not trust him, even after exposing the crimes of Stalin's regime at the 20th Congress of the CPSU in 1956. In Moscow A.L. Chizhevsky worked in applied science and engineering: He was a consulting scientist, later — Chief of laboratory and finally — Deputy-Head in aeroionization at the state trust with prosaic name «Soyuzsantekhnika», a large central projecting and inculcating institution responsible among other matters for ventilation and air conditioning in Soviet building industry [2, 10–11].

During the imprisonment and exile, A.L. Chizhevsky divorced his former wife T.S. Roschina-Tolstaya (1951) and married two more times. In Karaganda, his wife was Anna Mikhailovna Taranets (1912 —?), and after 1960 he married Nina Vadimovna Engelhardt (in first marriage Perishkol'nik), 1903–1982, whom he met much earlier (1945 or 1947), being still in Karlag. She was serving a sentence for her failed attempt in 1924 illegally leave the USSR. Spouses of A.L. Chizhevsky, first of all — T.S. Roschina-Tolstaya and, especially, N.V. Engelhardt played an outstanding part in the preservation of his scientific and artistic archives and in the fact that after the A.L. Chizhevsky's death his works were broadly published and exhibited [2, 8, 10, 12, 60, 66].

The significance of A.L. Chizhevsky's works for Medicine is essential. His heliobiological concept is now a basis for understanding of meteoropathy (weather dependence of human mood and diseases). In addition, it was important contribution in the biorhythmic aspects of the doctrine of reactivity. In the year of his 120th jubilee Nobel Prize in Medicine went to the scientists who discovered the genetic basis for sensitivity of our internal biorhythms to solar ones [78].

Besides, A.L. Chizhevsky discovered and experimentally investigated the opposite influence of positively and negatively charged atmospheric ions on the cells and organisms and applied this phenomenon in Physiotherapy and Communal Hygiene. He invented and inculcated in building and industry his «chandelier» for artificial aeroionization, as well as new applied methods of spray production, air cleaning, electrocolorization and defrosting, which improved the conditions of living and labor in different kinds of industry. Together with a S.T. Vel'hover he discovered cyclic metachromasia in bacteria depending on solar activity [79]. He was also a gifted poet, clever and deep memoirist [10] and bright popular science writer [80], a prolific philosopher in the spirit of Russian Cosmism and original painter. He was elected as a member of 18 Academies in many countries and enjoyed a membership of 30 scholarly societies and editorial boards. A.L. Chizhevsky died from laryngeal cancer in Moscow on 20 December 1964 at 8 a. m. and buried at Pyatnitskoe cemetery. Next to him lies his last wife (fig. 25).

Nowadays the Museum of Chizhevsky functions in Kaluga, where one can see also a bronze monument to him. A minor planet, two streets in Karaganda and Kaluga and one of the Aeroflot's jet planes — were named after this outstanding Solar Scholar.

In Belgium, «International A.L. Chizhevsky's medal» is awarded to the best young researchers of cosmic weather. In Sorbonne his bas-relief in included into gallery of the great scientists. In 1997 the State Bank of Russia portrayed A.L. Chizhevsky on memorial silver coin.

Analyzing the scientific literature of last decades, we can find a lot of confirmations for data, first obtained by A.L. Chizhevsky and/or for concepts first coined by him. These

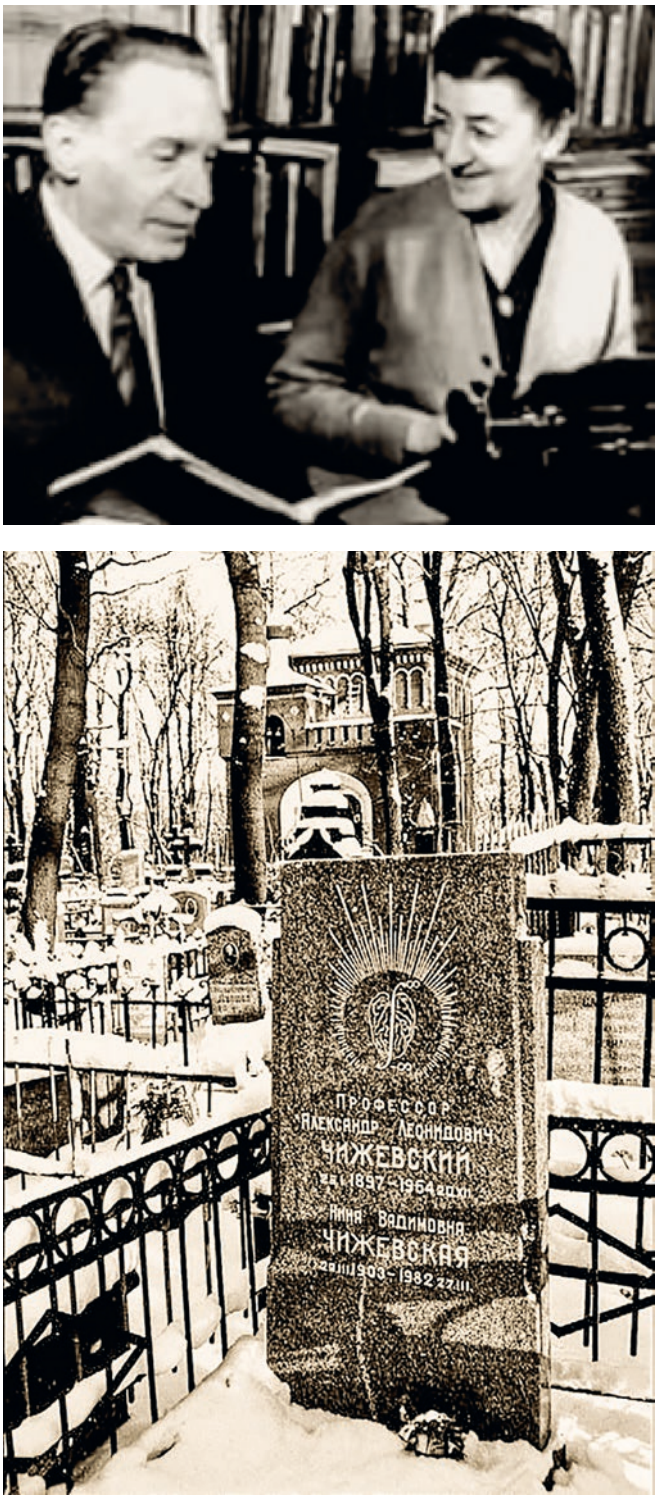

Fig. 25. A. L. and N.V. Chizhevsky together — in life [8] and after death [81]

papers came from many countries. Among them it is worth to mention early works by I.I. Nikberg et al. [82], whom Master inspired personally [8] and later studies of many domestic [83–86] and foreign [87–89] scientists. They not only confirm the original data by A.L. Chizhevsky via modern meta-analysis methods, but also demonstrate their correct extrapolation on the historical events occurred after A.L. Chizhevsky's studies. Moreover, new mechanisms of biological effects of negative aeroions — via peroxidation, superoxide anion bactericidal effect and alteration of mitochondrial function were reported recently, which fit with the concepts and suggestions of A.L. Chizhevsky, coined long ago.

Yet, the personality/legacy of A.L. Chizhevsky still was not comprehensively analyzed in foreign literature, and many papers of previous periods are biased to negative or positive sides, because of supravitally and posthumously happened political quarrels around him and his ideas [91]. Author wrote this paper in order to give foreign readers as objective brief scientific biography of Russian scholar, as possible. Now, in 120th year of A.L. Chizhevsky's birth, in spite of all tragic pathos of his fate: That of Master in the hands of Woland — we nevertheless consider him one of the most inspiring sunny figures in the history of domestic science. Power is transient, and Science is eternal.

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