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### Russian women at the beginning of human genetics

**Abstract.** *This paper reviews the studies on human genetics, carried out by Russian women in the 1920s and 1930s. Its main objective is to determine the contribution of women scientists to the development of different fields of human genetics. Particular attention is given to reconstructing women geneticists' research work, reviewing the content of their publications, and analysing the theoretical and methodological approaches they employed to tackle different scientific problems. The biographies of the pioneers in Russian "anthropogenetics" (knowledge of human heredity), R. I. Serebrovskaya, G. V. Soboleva, and N. N. Malkova, were restored on the basis of archival sources. The first women geneticists received their higher education at the Higher Women's Courses, as, in the Russian Empire, it was prohibited for women to study at the universities. These women came into genetics from traditional biological sciences or medicine at the time when human genetics as a discipline began to emerge in Russia in the 1920s. The first works in the field of anthropogenetics, conducted by these women on their own, began to appear in 1923. By the mid – 1920s, women geneticists began to use genealogical and twin methods for studying human heredity extensively. The number of women's publications peaked in the late 1920s. Studies in the field of population genetics and medical genetics gained popularity and new biochemical and cytological methods of analysis were added to the repertoire of analytical techniques. In the 1930s, with the beginning of attacks on eugenics, studies in human genetics were rapidly wound down to be completely arrested by the 1940s. The results of the studies carried out by the Russian women anthropogeneticists in the 1920s – 1930s included demonstrating hereditary nature of premature graying (R. I. Serebrovskaya), hemorrhagic diathesis and inguinal hernia (N. N. Malkova), deaf-mutism and stutter (G. V. Soboleva); determining the incidence of different genes in the populations; organizing large-scale twin studies to elucidate the role of heredity and environment in the manifestation of psychological traits; and introducing new methods for hereditary*



*disease diagnostics and the effective practices for teaching preschool and school age children.*

**Keywords:** *women geneticists; formation of medical genetics; gender history; 1920-1930*

### **Introduction**

A human genetics as the scientific discipline passed the complex way of its formation during XX century, and it occupies in the beginning of XXI century the leading positions among the most actively developed sciences by attracting to itself the attention of large sections of public.

The study of discrete heritable properties and diseases was put on the scientific base by the reopening of Mendel laws and the subsequent development of chromosome theory of heredity. The investigations of heritable basis of diseases, morphological, physiologic and psychological peculiar properties of human were actively used in medicine and education in the first half of XX century. 1920s years could be considered as the time of official appearance of human genetics in Russia. This direction of genetic investigations in our country has been formed practically simultaneously with the similar investigations in Europe and United States of America.

The initial stages of formation in the USSR of medical genetics (Babkov, 1998, 2001, 2006; Harper, 2018), neurogenetics (Korochkin, 2004) as well as the special features of Russian eugenic movement (Graham, 1977; Adams, 1990; Babkov, 2008; Fando, 2014; Kremontsov, 2010, 2014, 2015, 2018; Rudling, 2014) were described in the historical and scientific literature. The investigations in the area of eugenics, medical genetics and anthropogenesis were led by the prominent scientists: S. G. Levit, S. N. Davidenkov, Yu. A. Filipchenko, N. K. Koltsov, A. S. Serebrovsky. The scientific and organizational activity of leaders of Russian genetics is well known to the broad sections of specialists. Sometimes the impression is given that the human' genetics was created exclusively by man's scientists, because there was no historical-and-scientific investigations devoted to the role of women in the formation of Russian anthropogenetics. Let us try to remove the disappointing injustice and analyze the works of the first woman geneticists in the area of studying the human heredity.

### **Research methods**

The methodological basis of the study was the systemic, integrated, interdisciplinary and personality-psychological approaches. The complex use of the special historical methods: historical-genetic, problem-chronological, and biographical methods, made it possible to analyze the contribution of women scientists to the development of human genetics.

## **Results and discussion**

A large volume of scientific works published in the periodical editions from 1917 to 1948, i.e. by a time of destroying the Soviet genetics, was used for analyzing the human genetics investigations fulfilled by the first Russian woman's scientists. The articles from all numbers and issues up to 1948 were under consideration for the following scientific journals and collected papers: "Bulletin of Moscow Society of Naturalists", "Russian Eugenic Journal", "Biological Journal", "Papers of the Academy of Sciences", "Medico-Biological Journal", "Success of Experimental Biology", "Bulletin of Moscow State University (MSU)", "Anthropological Journal", "Proceedings of the Academy of Sciences", "Proceedings of Eugenics Bureau", "Journal of experimental biology and medicine", "Proceedings of the Institute of experimental biology".

The sharp rise in developing the new interesting problems, methods and techniques of investigation was observed at the beginning of Russian anthropogenetics' development. Topics on the human's biological nature, the effect of heredity and medium on determining the psychological characteristics of people were actively discussed in this period of time in society. The eugenic views on the improvement of human race, the possible increasing of lifetime, the creation of superman were also becoming popular. It is not unlikely that the state of public opinion had an influence on the interest of scientists to study the human genetics. However the women were engaged in anthropogenetics a little later on and their first pioneering works had been appeared only in 1923–1925. The detailed analysis of publications interested for us has shown that the problems of human heterochromosome texture (Breslavets, 1923) and inheriting of different peculiar properties in families (Soboleva, 1924, Krasovskaya & Popov, 1925) were mainly interesting for woman geneticists at the beginning of 1920s. The twin pair (Soboleva, 1926) and genealogical (Strogaya, 1926) methods of studying human heredity became especially popular in the middle of 1920s. A comparison of a number of publications on humans genetics in the different years allowed to install that the peak of such publications for woman scientists took place in 1929, the spectrum of investigations that were carried out by them increased substantially as well as the new problems and methods of medical genetics (Krytova, 1929; Serebrovskaya, 1929b; Soboleva, 1929b; Teulina, 1929) and human genetic of population (Malkova, 1929; Serebrovskaya, 1929a) were actively developed. It turned out that the woman anthropogeneticists had no peculiarity to publish the eugenic ideas and programmatic articles on the problem of improving the human race in contrast to the known man geneticists (Bunak, 1922; Koltsov, 1922; Volotskoy, 1923; Lyublinsky, 1926; Lass, 1927; Serebrovsky, 1923, 1929). It can be connected with the psychological peculiarities of women: as a rule, they keep the permanency, try to create the family comfort, were sensible and not satisfied with the role, which the supporters of eugenic transformations of society assigned to them.

The considerable reduction of publications on the problems of inheriting the different human properties has been observed since 1930. Because of started criticism, the “Russian eugenic journal” has been already not published since 1930. The first attempts of state interference in genetics were made in that time, and the control was finally established by All-Union Conference on planning the genetics and selection carried out in Leningrad in 1932. It was decided at this conference that since that time the works on genetics would be carried out on the directions corresponding the official doctrine of dialectical materialism. Therefore if in the beginning of 30s you could find some publications of women anthropogeneticists, you will find only the single publications in the period from 1935 to 1945 (Soboleva, 1937). Articles on the problems of carcinogenetic including the works of R. P. Martynova appeared in the end of 1940s (Martynova, 1948a, 1948b).

The scientists-anthropogeneticists were criticized for the underestimation of new social conditions in the process of forming personalities. In the same time the thoughts on a possible selection work in human society were subject to the harsh criticism. Not many people could stand to such nerve-strain, especially when the politically-loaded and ideologized factors, which were alien to the science, had interfered in the scientific disputes. The most woman geneticists turned switch for working with the new objects of investigations and tried not to advertise their early works in human’s genetics. As a result these works have been forgotten for long time. It was perhaps the reason of absence of any historical-and-scientific investigations of anthropogenetic works of Russian woman scientists. Let us correct this unfortunate mistake and try to tell about the first woman anthropogeneticists and women works in field of human heredity.

Raisa Issakovna Serebrovskaya (1888–1981) took a great interest to anthropogenetics owing to her husband A.S. Serebrovsky, the prominent Russian geneticist, who has begun to read his lectures on human genetics on Anikovskaya station already in 1922. Raisa Isaakovna was born in Simbirsk in the family of Jewish doctor. It was accepted to believe that the maiden name of Raisa Isaakovna was Galperina. The historical inaccuracy was corrected after regeneration of archive documents. Raisa Isaakovna had a family name Galperin (TsGAM. F. 363. Ser. 4. File 6639. P. 1). After entering the Faculty of Physics and Mathematics of Petersburg Higher Woman’s Courses (Bestuzhev’s Courses) in 1905, since the first days she took a great interest in studying the nature. Having left the courses in 1910 she received the specialty of zoologist. In 1905–1907 Raisa Isaakovna took part in the revolutionary movement. In September 1911 Raisa Isaakovna submitted the application for her enrolment on the medical faculty of Moscow Higher Woman’s Courses however she was refused. We found in the Central State Archive of the City of Moscow this refusal. It was explained by the fact she had by that time the higher natural-scientific education, while the graduates of gymnasium were, first of all, admitted at the Courses (TsGAM. F. 363. S. 4. F. 6639. P. 3). In our opinion, the

reason of this refusal could be quite different. Really there was a spot of Raisa Isaakovna reputation connected with her participation in the revolutionary movement.

However the thirst for science took upon itself and Rasa Isaakovna went to the A. L. Shaniavsky Moscow City People's University, where she was acquainted with A. S. Serebrovsky. After interesting work in Shaniavsky University and at the Biological Station in Sevastopol, R. I. Serebrovskaya continued scientific studies at Tuskaya Entomological Station, where she worked from 1915 to 1918. In 1918–1920 she was a coworker of Poultry station (in Tuskaya guberniya), while in 1920–1923 – of Central Genetic Station in Annikovo. Raisa Isaakovna was occupied since 1928 with the problems of human's heredity as a scientific researcher of Medical and biological Institute (AMGU. F. O/K. S. 2. F. 8188. p. 1–9).

A. S. Serebrovsky, who had stood near the sources of Russian genetics, managed to load his wife by the problems of mathematical analysis of population. By regret, the methods of genetic analysis, especially if it applied to the human, were not quite well developed. The formulae for calculating the frequencies of different genes concerned only the cases, when the hereditary properties became apparent in full. However many properties become apparent not obligatory with the existence of corresponding gene. A per cent of appearance could be different for the different properties and it is possible to calculate some value  $K$  named as a coefficient of manifestation. R. I. Serebrovskaya described the different variants of accounting the properties' appearance by using the coefficient of manifestation based on the determination of phenotypes' frequency and genotypes' ratio in the posterity of different marriages (Serebrovskaya, 1929a).

The fulfillment of detailed analysis on some or other inheriting property demanded the processing of sufficient amount of materials. Therefore the Medical and biological institute organized the required research expeditions in the different regions of the country. During the study of early graying inheriting R. I. Serebrovskaya had analyzed the family trees of a few families of Northern Caucasus, where this property became apparent over some generations.

As it is well known the hair graying begins after the age of 30, and it begins much earlier only for a small amount of people. At that the process occurs quicker than usually. As a result of investigation 12-years old girl was met in one Kabardian village. Her half of the head was completely grey, while the graying for all family trees described by R.I. Serebrovskaya was begun in the period from 14 to 23-years. She found the direct correlation between the existence of goiter and the early graying (Serebrovskaya, 1929b). The wide spreading of early graying was remarked in summer 1929 during the inspection of Kabardinian and Balkarian villages at Northern Caucasus. At that the Balkarians were proud by existence of this property as a symbol of noble origin. The observation of Serebrovskaya showed that the wide spreading of crop was typical for the mountain villages, for example, 22% of men and 100% of women in Higher Chegem had the hypertrophy of thyroid gland.



In 1931 Raisa Isaakovna ceased to engage in human genetics and had left the Medical and biological institute because of started criticism of this science. Her husband had suffered seriously because of these accusations. His article “Anthropogenetics and eugenics in socialistic society” (Serebrovsky, 1929) was published in 1929. He stated in this article that the mutation process stipulated the change of mankind’s gene fund; at that the influence of harmful mutations is increased in time. As a result the degeneration will threaten to the mankind in future, while the prevention of that is possible by undertaking the effective measures. At that it is necessary to revise the usual social conditionality’s in society, for example, the love relations in marriage should be separated from the child-bearing, while the bank of spermatozoa from the talented persons free from the inherited deceases should be created for improving the human race and for carrying out the large-scale artificial insemination.

The scientist was subject to the public persecution for this article even after many years. The eugenic views have being brought as a fault to Serebrovsky from 1930s to the death (1948). Raisa Isaakovna Serebrovskaya switched over to the new matter of investigation after transferring in 1931 to the MSU chair of genetics and selection. It was the fruit-fly *Drosophila*. Serebrovskaya devoted herself to the problems of mutation variability and development of the methods for calculating the quantitative properties.

The inheritance of different human properties was studied by N. N. Malkova worked with R.I. Serebrovskaya in Genetic Department of Medical and biological Institute. Nina Nickolaevna Malkova was born in the family of military man in 1896. She received the education in Tashkent female gymnasium. In autumn 1913 she entered at the evening courses attached to the same gymnasium for taking the exam on gymnasium-leaving certificate. After the successful exam, N. N. Malkova being the daughter of light colonel went on the front-line forces as a nurse. In 1915 her desire to continue education resulted in her joining to Moscow Higher Woman Courses, which were transformed in the Second MSU in the time of her leaving them (TsGaM. F. 363. S. 4. F. 16026. P. 10). After receiving the higher medical education N. N. Malkova devoted herself to the scientific-research work – the genetics of some medical deceases.

N. N. Malkova paid a special attention to the stationary study of human’s population – to the method, which has been yet not used by somebody (Malkova, 1929, 1930). The essence of this method consisted of studying the close population of people such as the countryside. She undertook the measures on organizing the anthropogenic station in countryside. By means of inspection of some districts of Moscow guberniya she chose the Petrovskaya volost of Zvenigorod uyezd. This district corresponded to all necessary requirements. The volost consisted of 30 villages and had 100000 people of population, which were mainly engaged in agriculture and handicraft.

N. N. Malkova began to work on the 15<sup>th</sup> January 1929. First of all she was recovering the family trees of peasants carrying out in parallel the overall medical inspection of villages' population. The dactyloscopy and blood test of each peasant was carried out as well as all properties accessibly for study were noted: the color of hairs and eyes, the type of teeth growth, the times of graying and growing bald beginning. The family cases of inherited deceases were described and the type of some properties of inheritance was determined as a result of fulfilled titanic work.

The doctors of Petrovskaya hospital rendered the large assistance to this work. Nevertheless, some difficulties have been met in carrying out the genetic analysis of population. The rumors about "the end of the world", "the Antichrist seal" (dactyloscopy), "the trade of Christian blood" were spread etc. The support of investigations by the local Party and public organization had saved the situation.

It was noted the large spreading of hernia during the carrying out the stationary investigations; the occurrence of hernias among the different families was compared separately. The spreading of different typed of hernias (omphalocele, groin, crural, epigastric ones) was different for men and women. In this connection the analysis of inheriting the disease was carried out for the different sexes.

The groin hernia is most spread among the men (94.1% from all cases): the positive correlation of this disease was observed in the families. The amount of omphaloceles among the men and women was practically the same. N. N. Malkova installed that the age was rendering the influence on omphalocele occurrence. At that this influence is different for the men and women: if the per cent of omphalocele carriers is decreases in age for males, it is increased for females up to 40-years and is then decreased modestly. I.e. the omphalocele is appearing more often for men in the childhood, while for women – in the higher age. The correlation on this type of hernia was absent for families.

The N. N. Malkova's work on the stationary study of people population allowed implementing actively the new methods of investigation for solving the nodal problem of medicine – the determination of diseases etiology.

In the process of studying the hemorrhagic diathesis N. N. Malkova and S. G. Levit ran across the new disease, which has not been described before. The thoroughgoing study of this disease's genealogy allowed to state that this case is connected with the appeared mutation (Levit & Malkova, 1929). The mutant gene was dominant, while the disease excited by it was called heterohaemophiliya. The ailment startled men and women to the same extent and was begun in the early childhood (mainly for the babies). The ill people suffer from the strong bleeding at the nose and gingivae, which can appear spontaneously or after the least trauma. For some persons the bleeding became stronger by 8-12 years, for the other ones the bleeding is decreased by this age. The strong bleeding uninterrupted for a long time is observed for all ill people in the case of cuts. The work of describing the heterohaemophiliya gene included the genogeographical aspects installing the region of mutation origin and the processes reconstructing its spreading.

There is no one publication in historical Russian genetics about the input of Galina Vasilievna Soboleva in the human genetics development. Nevertheless, her pioneer investigations laid the base for understanding the nature of different morphophysiological human properties.

Galina Vasilievna was born in 1896 in Kharkov in the family of doctor Vasily Grigorievich Sobolev. In 1913 she graduated from the Nickolaevskaya gymnasium, while in 1914 she entered the Physical and mathematical faculty of Natural-scientific department of Moscow Higher Woman Courses. After receiving the higher education G. V. Soboleva was occupied for a long time with the problems of anthrop genetics introducing the new approaches and methods of investigation (TsGAM. F. 363. S. 4. F. 23536. pp. 12–16).

The twin method suggested by F. Galton in 1876 remains one of the most popular methods of human genetics since the moment of this science origin and up to the present time. In spite of sufficient spreading of this method, there was yet not sufficient amount of methods for the genetic analysis of twins in 1920s.

The investigations of twins in city Moscow were planned by the Eugenic Department of Experimental Biology Institute. The program of investigations was developed by Prof. V. V. Bunak; the carrying out of corresponding inspection of twins was assigned to G. V. Soboleva. The undertaken work was consisted of two stages:

1. Composition of family trees of twins under investigation.
2. Investigation of twins themselves for determining the role of inheriting and medium in formation of some property or other.

The family tree for twins was constituted in detail, in the same time the data for each member of family concerning the most important diseases and professions were written. The investigations of twins themselves included the morphological, physiological and psychological parts. The pigmentation (the color of eyes, hairs and skin), the special features of hairs, the form of lips and ears, the height, weight, width of shoulders, the circle of chest, the volume of muscles and adipopexis were taken into account in the morphological study. The circumference of head, its longitudinal diameter the width of face, a length and width of nose were taken into account as the morphological characteristics of head. The form and sizes of teeth, the bite and a form of upper palate, the dactyloscopic properties were also described. The physiological analysis included the general characteristics of twins state of health from their birthday and the reaction of isohaemoagglutination. The psychological part of inspection had to answer the question on the similarity and differences in the twin spirits. The total inspection was carried out by G. V. Soboleva during the visiting of twins families. The necessary addresses were mainly obtained from the pedagogical collectives of Moscow schools. The inspection has been fulfilled in 1923–1924. From 105 twin couples 40 couples were one-oviparous (38%) and 65 couples – were fraternal twins (62%). The usual percent of twin birth constitutes 1.1% from all births. In the same time it was widely believed that the probability of twin birth was



increased with the growth of mother age. However the results of investigations carried out by G. V. Soboleva rejected the existed mistake that the most number of twins were born from the women in the age of 35–39 years. G.V. Soboleva installed that the maximum percent of twin's birth accounted for the mothers in the age 25–30 years, i.e. in the most reproductive period (Soboleva, 1926).

The investigations of G. V. Soboleva deflated also the mistaken viewpoints that the twins were overburdened, as a rule, by the different mental disorders. Only during the first year of life they remained behind the normal children. The most retarded twins were the fraternal digeneous twins, which gave as well the highest percent of twins growing in the different way: one – normally and the second one – with the more or less delay.

An estimate of the state of health of the children under inspection showed that the one-oviparous twins had the satisfactory health, while the fraternal twins had a reduction of the state of health; in the same time the fraternal one-sex twins exceeded in this case the one-oviparous twins.

Another aspect of anthropogenetic investigations of G. V. Soboleva was the analysis of different inheriting diseases (Soboleva, 1929a, 1929b, 1931). She had proved that the stuttering is a disease passing from the generation to generation. The inspection was mainly carried out on the ill stutterers from Nervomental dispensary attached to the Institute of social sanitation and Psychiatric patronage no.2 in Moscow. 136 family trees of 136 probationers suffering from stuttering were constituted as a result of fulfilled work. The stuttering for the majority of people under inspection appeared in the age of 5–7 years. A number of stutterers among the men were almost in six times more than for the women (116 men and 20 women).

For installing the endogenous reason of stuttering, G. V. Soboleva used the methods of genetic analysis by comparing the percent of stuttering spreading among the total population (1%) with its spreading among the relatives of persons under investigation (6.7%) and among their own brothers and sisters (15.2%). In addition it was possible to trace the character of stutter inheriting – it transferred on the principle of recession. G. V. Soboleva noted that the abundance of mental diseases was observed among the stutterers. She explained it by the possible polymorphous nature of stuttering gene.

One of the G. V. Soboleva merits consisted of the study of different forms of deafness and dumbness, which were not limited by the exclusively inborn cases of disease. She has applied to the Moscow club of deaf people and in the schools for deaf and dumb children, where she received the addresses of families with the corresponding deviations. The translator of sounding speech by means of the fingers language for the deaf people attracted specially for it has helped to G. V. Soboleva in collecting materials and carrying out the necessary survey. The clinical analysis of deaf probationers together with the members of their families was carried out simultaneously with obtaining the genetic data. The goal of clinic investigations was

the installation of objective reasons of appearing the deaf and dumb cases for some man or other.

The fulfilled investigations allowed approving that the gene of congenital deafness was recessive, because the children from a marriage of deaf people had inherited this property in full (Soboleva, 1931). A large amount of families, in which the hereditary deaf children were born from the healthy parents, pointed out as well on the recessive nature of this disease. The polyhybrid theories of deafness inheritance were also not confirmed in the result of genetic analysis.

The acquired forms of deafness and dumbness were divided by G. V. Soboleva into groups: a) the accidental traumatic forms; b) the cases conditioned by inherited predisposition, for which there are the combined action of outside and inside reasons. G. V. Soboleva called to the more detailed study of reasons of appearing the deafness in each individual case that is important for the family planning and the organization of efficient treatment of acquired forms of disease.

In addition to the development of different techniques of twin analysis and the study of inheriting diseases, Soboleva G. V. was busy herself with the genetics of different morphological and physiological features of human. One of her works was devoted to the color heritability of iris of the eye (Bunak and Soboleva, 1925).

There were for a long time the contradictory opinions on the problem of iris of the eyes. The investigators of different countries denoted by the identical names the quite not identical colors. For example, something that was considered as light-brown or grey for Italian anthropologists became dark-brown for Swedish anthropologists. The different authors had also the different number of tints – from 4 to 13. For clarifying this question and finding the criteria for division of separate tints, V. V. Bunak, who was the scientific supervisor of G. V. Soboleva, carried out the special investigation: he described the possible tints, which are adopted by the same eye in the different conditions of illumination and in the different distance. The work on the clarification of different groups of tints in the result of carrying out the statistical analysis of humans' population was entrusted to G. V. Soboleva. During spring and autumn of 1921 she had investigated the elements of iris colors approximately for one thousand children from the different Moscow schools. The predominant color of eyes was determined for the children under investigation in the conditions of good lighting first in the far (about 1 m) and then at a short distance. G. V. Soboleva allocated the following main iris colors: black, brown, yellow, green, grey, light blue and dark blue. The dark kind without a picture and the light kind with a picture were allocated among the brown eyes. The allocation of tints on lightness in the iris of other colors is excessive, because the dark-green eyes correspond to the yellow-green ones, the light green – to grey-green, dark-blue – to grey- light blue, dark grey – to grey-blue. This extrinsic element seemed to be very typical for all similar eyes; these types of eyes were related to the transitional just due to this element. The given work attracted the large statistical material and allowed to criticize severely many before adopted typologies of eyes coloration.

Elaborations and methods, obtained by anthropogeneticists required the active implementation in the practice of diagnostic, medical, correctional and educational institutions. Many advanced doctors and teachers became not only to use the achievement of science on inheriting properties of human, but also took part in the development-experimental work on the collection of statistical material, carrying out the survey, composition of family trees. So, for example, the Medical and biological Institute leaded by S. G. Levit worked in the close collaboration with the different organizations (Babkov, 2001). In 1933 the institute organized the Department of Psychology. The kindergarten was working in institute and the twins were especially attracted there. The twins-teenagers were patronized for taking out the education and choosing the profession. So, in accordance with S. G. Levit's desire the five couples of twins learned in the conservatoire for the detailed study of talent for music and the clarification of effective methods of training.

By regret, the events turned around the Russian genetics in 1930–1940s didn't avoid the practically oriented investigations of the first woman geneticists. The open persecution of the research workers of Medical and Genetic Institute (the former Medical and Biological Institute) was begun in 1936, and it was finished by closing the institute in summer of 1937. In 1938 the director of institute S. G. Levit was arrested and shot afterwards. The secret prohibition was laid on the medical and pedagogical genetics still in 1930s, and it was legalized in August 1948 after the ruefully known session of VASKhNIL. Many geneticists had lost the work and were forced to change the profession. It was equally hard both for the man and woman geneticists. It happened to get a job as school-teachers, educator in boarding school, translators, and librarians or simply to stay without means of subsistence.

### **Conclusions**

The fates of many women anthropogeneticists were similar in some way. They had the excellent gymnasium education, and then they graduated the higher women courses and could firmly survive the troubles of WWI, Civil War and WWII, devastation of revolution and rout or defeat of genetics. By regret it was impossible to follow the further trajectories of vital fates of N. N. Malkova, G. V. Soboleva. There is a hope that it will be possible with time to reestablish the gaps in the history of Russian human's genetics connected with activity of the first woman's scientists.

Nevertheless, the fulfilled study of woman genetics publications allow to state that they were mainly occupied with the problems of medical pedagogical genetics, i.e. the directions, which are closely connected with the cognitive and practical woman interests. Nobody from mentioned woman scientists promoted the ideas about the radical eugenic methods, which were necessary for perfecting the human race and reducing the birth of inheriting pathologies. The theoretical substantiation of importance of carrying out the social hygiene and the specific methods for its realization could be met only in the works of prominent man geneticists.

It is natural that in the period of “soviet feminism”, when the women began to play the active public and political role, to work in the spheres and branches traditionally considered as “man’s”, the vulgar ideas of eugenic undertakings aroused the avalanche of protests and critics primarily from the representatives of “already far not fair sex”. The woman workers of factories and simple woman kolkhozniks wrote in the Party bodies and printing publications protesting against the undertakings on the conversion of genetic properties of mankind. It is possible that the company of fighting with genetics was prepared and realized by means of other forces. Nevertheless, the crying public voice heated up the negative relation to the entire anthropogenetics and to the genetics on the whole.

The begun persecutions on genetics have been continued still up to 60s of XX century. But even after the official rehabilitation of human genetics there was a fear of biologizing tendencies in soft science: the works on genetics of behavior and psychics, inheriting of intellectual ability were recognized as doubtful. The idea on the social human nature predominated in the tradition of Soviet psychology and pedagogy, while the psychoanalysis and behaviorism were subject to the serious criticism.

Nevertheless, the phenomena and mechanisms of inheritance as well as the genetic methods opened in 1920–1930s have been actively used until now. It is not strange that the reconstruction of history of Russian anthropogenetics and the description of woman scientist’s activity in investigating the inherited human properties become relevant in the present time, when the discoveries in the field of human genetics have practically revolutionary character. It is not illegal to forget about woman geneticists, who managed to realize themselves in servicing to the precious ideals of human inheritance science. Don’t forget that the women scientists managed to achieve the unprecedented success in the area of medicine and pedagogical genetics as well as to implement the obtained results in the practical activity of educational and medico-diagnostic institutions for the comparatively short period of Russian anthropogenetics formation.

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### Російські жінки біля витоків генетики людини

**Анотація.** У статті розглянуті дослідження російських жінок в області генетики людини в 1920-1930 рр. Основним завданням статті стало визначення внеску жінок-вчених у розвиток різних напрямків генетики людини. Велику увагу в роботі приділено реконструкції науково-дослідної діяльності жінок-генетиків, змісту їх публікацій, аналізу запропонованих ними теоретичних і методологічних підходів при вирішенні різних наукових проблем. На основі архівних джерел відновлені біографії піонерів російської антропогенетики: Р. І. Серебровської, Г. В. Соболевої, Н. М. Малкової. Перші жінки-генетики отримали вищу освіту на Вищих жіночих курсах, так як в Російській Імперії існувала заборона на навчання жінок в університетах, в область генетики вони прийшли з традиційних біологічних наук або медицини. Цей прихід збігся з початком формування генетики людини в Росії в 1920-і рр. Перші самостійні роботи жінок з антропогенетики стали з'являтися вже в 1923 р. до середини 1920-х рр. жінки-генетики стали активно використовувати в своїй роботі близнюковий і генеалогічний методи аналізу спадковості людини. Наприкінці 1920-х рр. спостерігався пік публікацій жінок в області генетики людини, популярними стали популяційно-генетичні та медико-генетичні дослідження, в арсенал були включені нові біохімічні та цитологічні методи аналізу. У 1930-і рр.у зв'язку з початком гонінь на євгеніку дослідження з генетики людини були різко згорнуті, а до кінця 1940-х рр. повністю припинені. Результатами досліджень російських жінок-антропогенетиків 1920–1930-х рр. став доказ успадкування раннього посивіння (Р. І. Серебровська), геморагічного діатезу і пахової грижі (Н. М. Малкова), глухонімоти, заїкання (Г. В. Соболева), виявлення частоти зустрічальності різних генів в популяціях, організація масштабних близнюкових досліджень для з'ясування ролі спадковості і середовища в прояві психічних ознак, впровадження нових методів діагностики спадкових захворювань і ефективних прийомів навчання дітей дошкільного та шкільного віку.

**Ключові слова:** жінки-генетики; формування медичної генетики; гендерна історія; 1920-1930

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### **Российские женщины у истоков генетики человека**

***Аннотация.** В статье рассмотрены исследования российских женщин в области генетики человека в 1920–1930 гг. Основной задачей статьи стало определение вклада женщин-ученых в развитие различных направлений генетики человека. Большое внимание в работе уделено реконструкции научно-исследовательской деятельности женщин-генетиков, содержанию их публикаций, анализу предложенных ими теоретических и методологических подходов при решении различных научных проблем. На основе архивных источников восстановлены биографии пионеров российской антропогенетики: Р. И. Серебровской, Г. В. Соболевой, Н. Н. Малковой. Первые женщины-генетики получили высшее образование на Высших женских курсах, так как в Российской Империи существовал запрет на обучение женщин в университетах, в область генетики они пришли из традиционных биологических наук или медицины. Этот приход совпал с началом формирования генетики человека в России в 1920-е гг. Первые самостоятельные работы женщин по антропогенетики стали появляться уже в 1923 г. К середине 1920-х гг. женщины-генетики стали активно использовать в своей работе близнецовый и генеалогический методы анализа наследственности человека. В конце 1920-х гг. наблюдался пик публикаций женщин в области генетики человека, популярными стали популяционно-генетические и медико-генетические исследования, в арсенал были включены новые биохимические и цитологические методы анализа. В 1930-е гг. в связи с началом гонений на евгенику исследования по генетике человека были резко свернуты, а к концу 1940-х гг. полностью прекращены. Результатами исследований российских женщин-антропогенетиков 1920-1930-х гг. стало доказательство наследования раннего поселения (Р. И. Серебровская), геморрагического диатеза и паховой грыжи (Н. Н. Малкова), глухонемоты, заикания (Г. В. Соболева), выявление частоты встречаемости различных генов в популяциях, организация масштабных близнецовых исследований для выяснения роли наследственности и среды в проявлении психических признаков, внедрение новых методов диагностики наследственных заболеваний и эффективных приемов обучения детей дошкольного и школьного возраста.*

***Ключевые слова:** женщины-генетики; формирование медицинской генетики; гендерная история; 1920-1930*

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