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THE PHENOMENON OF DEMIKHOV.

In the Sklifosovsky Institute (1960-1986).

Fighting "windmills" or lack of conditions (1961)

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The article describes the results of V.P. Demikhov's working at N.V. Sklifosovsky Institute for Emergency Medicine in 1961. We have presented a brief report of his laboratory activities and a prospective working plan that included preparing for vital organ transplantations in clinic, conducting immunological and morphological studies, resolving resuscitation issues, all aimed at: 1) revitalizing dead people and their organs for transplantation, and 2) preserving the vitality of the isolated organs before transplantation. For the first time in the history of national surgery, the question of "brain death" was raised as a criterion for the possibility of organ harvesting.

However, the documents we have reviewed demonstrated that such a plan was impossible to be realized with the efforts of a single institution. V.P. Demikhov was advised to revise the plan, abridge it, and bring it into line with the modest potential of the Institute to organ transplantations.

Keywords: V.P. Demikhov, N.V. Sklifosovsky Institute for Emergency Medicine, 1961, organ transplantation in the experiment and in clinic

More than 7 months of V.P. Demikhov's working at a new place passed. It seemed possible to sum up some results. Therefore, on February 1, 1961, his "Report on the implementation of the Research Program by the Laboratory for Transplantation of Revitalized Organs in 1960 and the planning for 1961" was presented at a Meeting of the Scientific Council¹ of N.V. Sklifosovsky Research Institute. Unfortunately, it so happened that there were no texts of Demikhov's and his reviewers' reports, Professor I.I.Shimanko (physiotherapist), and Professor A.V.Smolyannikova (pathologist) in the Proceedings of that Meeting. Then we looked at the "Report on Research Programmes of N.V.Sklifosovsky Research Institute for Emergency Medicine in 1960 and the planning for 1961".

This is what we found there:

"V.P. Demikhov conducted a study on plastic surgery on coronary vessels and came to the following conclusions:

1) It can be assumed that in all cases when the coronary circulation depends on the lesion of the initial part of the coronary artery, making a direct anastomosis of this artery with the internal thoracic artery below the level of its lesion will lead to the restoration of sufficient coronary circulation;

¹ The "Scientific Council" was the name of the Academic Council of N.V. Sklifosovsky Institute as mentioned in the Archival documents in 1961.

2) In myocardial infarction that occurs during thrombosis of a large branch of the coronary artery, an emergency surgery (within 1 hour) to create a coronary-mammary anastomosis will help to restore the coronary circulation and prevent the infarction development" [1, p.47].

We did not find any other information about the work of the Laboratory in 1960 in the Institute Report. But if in 1960, V.P. Demikhov was busy with the arrangements of his Laboratory and could not do so much, his planning for 1961 that was incorporated in the Working Plan of the Institute intertwined by the archivist together with the Report for the previous year, was more than just large – it was enormous!

When reading that plan, it seemed that V.P. Demikhov's "dreams" were unlimited. Judge it for yourself:

"In 1961–1962, the issues of heart, lung and other organ transplantation in the experiment shall be developed. The immunological reactions in organ transplantation, the methods of mechanical ventilation in the experiment, and a number of other issues shall be studied. Attempts will be made to switch on the revitalized organs from fresh corpses.

Special work shall cover the tissue (in particular, bone marrow) harvesting from corpses and procurement for therapeutic purposes.

Topics:

1. Experimental heart, lung, and other organ transplantation.

Coordinator and implementer: V.P. Demikhov.

Objective: a) To develop, in an experiment on dogs and human corpses, such heart and lung transplantation schemes that could be applicable to humans in the future²; b) To improve and develop anew the techniques of joining blood vessels; c) By preventing and coping with the complications leading to the premature death of experimental animals, to achieve their longer survival.

² An absolutely new trend in Russian transplantation for that time.

During the surgical interventions, the physiological, immunological, electrocardiographic, pharmacological and histopathological studies shall be conducted.

2. Immunological reactions in organ transplantation.

Coordinator: M.M. Kapichnikov, implementer: V.P. Demikhov.

Immunological studies shall be made in organ transplantation in search for antibodies in blood of organ transplant recipients. The studies will be conducted in cooperation with the Laboratory of Immunology (headed by M.M. Kapichnikov) of the Institute of Experimental Biology, the USSR Academy of Medical Sciences³.

3. Morphological studies at different times after organ transplantation.

Coordinator: Prof. T.A. Grigorieva, implementer: V.P. Demikhov.

Objective: The search for alterations in the transplanted organs at different times after transplantation.

The study will be conducted in cooperation with the Histology Department (headed by Prof. T.A. Grigorieva) of the 2nd Moscow State Medical Institute (MGMI⁴, transliterated Russian abbreviation).

4. Electrocardiographic investigation of transplanted hearts in the experiment and of revitalized hearts in the clinic⁵.

Coordinator: V.P. Demikhov, implementer: V.M. Goryainov.

5. A long-term maintenance of life in a revitalized human body (with irreversible brain abnormalities).

³ Established in 1932 as the Experimental Biology Department of All-Union Institute for Experimental Medicine (transliterated Russian abbreviation VIEM), headed by Prof. A.G. Gurvich; named as the Institute of Experimental Biology, the USSR Academy of Medical Sciences (Director Prof. A.G. Gurvich) since 1945; named as the Institute of Medical Genetics of the USSR Academy of Medical Sciences (Director Prof. N.P. Bochkov) since 1969; at present has the name of the Medical Genetics Research Center (Director Prof. S.I. Kutsev).

⁴ Doctoral thesis by T.A. Grigorieva covered the study of the blood vessel innervation. She was the Head of the Histology Department of the 2nd MGMI from 1960 to 1969. Nowadays, it is the Department of Histology, Cytology and Embryology of the Medical Faculty of the Russian National Research Medical University named after N.I. Pirogov.

⁵ Interesting is the fact that at the same time, the first similar studies in this country were performed during heart operations in clinic. See: G.G. Gelshtein. Changes in the electrocardiogram during mitral commissurotomy. Thesis for the Degree of the Candidate of Medical Sciences. M., 1960.

Coordinator: V.P. Demikhov, implementers: V.P. Doroshchuk, V.P. Demikhov, and V.M. Goryainov.

Revival of corpses delivered by ambulances: if not enough time has passed since the time of death, then in some few cases the brain and the whole body can be revived. In most cases, it is not possible to revitalize the brain, and in this case the life of the body would be maintained by the revived heart, mechanical ventilation, nutrition, and the necessary microclimate. After being convinced of impossible brain revival, the question of organ transplantation from such a body to especially needy patients can be raised⁶.

The life of the revived body will be maintained in a special unit, with a special round-the-clock care provided by the scientific and practical personnel, using the aseptic techniques. These experiments can be started only after the validity issue of using a corpse [for a similar purpose] has been resolved with the forensic authorities.

6. The study of various mechanical ventilation methods in experiments on animals and while maintaining the life of revitalized organs and tissues (except for the central nervous system) in the whole human body.

Coordinator: V.P. Demikhov, implementer: V.P. Doroschuk.

Objective: To achieve a long-term maintenance of life in revitalized heart-beating bodies without the brain.

7. Transplantation of bone marrow (of the sternum) in the experiment.

Coordinator: Prof. A.V. Lebedinsky, implementers: V.P. Demikhov and Yu.M. Zaretsky.

Transplantation of the whole bone marrow (of the sternum) on the vascular pedicle in order to: 1) ensure a positive effect in case of blood diseases caused by radiation; 2) restructuring of body hematopoiesis.

The research will be carried out in cooperation with the Biophysics Institute of the USSR Academy of Medical Sciences⁷.

⁶ For the first time, the "brain death" issue was raised as the main criterion for the possibility of organ harvesting in the clinic.

⁷ Prof. A.V. Lebedinsky headed the Biophysics Institute of the USSR Academy of Medical Sciences from 1954 to 1963.

8. Limb transplantation in the experiment.

Implementers: V.P. Demikhov and P.I. Androsov.

Objective: To justify making such operations in clinic" [1, p.109-122].

The immensity of the plans is impressive! Here is the refining of the vital organ transplantation technique on human corpses, studying the issues of their immunology and morphology after transplantation in animals, and investigating the resuscitation problem for victims with traumatic brain injury, and also the sternum and limb transplantation. And all that was practically for the first time in this country. But if V.P. Demikhov planned to revive victims with a head injury, he had to include in his plans joint research with the Neurotrauma Department established in 1960 and headed by V.V. Lebedev. However, there is no information about it in the documents [2].

But immediately a reasonable question arises: who should do all that, if V.P. Demikhov was practically the only implementer of all the planned topics? Of course, in a number of topics, there were co-implementers such as his Laboratory employee V.M. Goryainov, immunologist M.M. Kapichnikov, pathologist T.A. Grigorieva, anesthesiologist V.P. Doroshchuk, biophysicist A.V. Lebedinsky, immunologist Yu.M. Zaretskaya, surgeon P.I. Androsov. But half of those scientists were not the employees of the Sklifosovsky Institute. And where is the close-knit team of surgeons, physiologists, immunologists, biochemists, and pathologists? And who will let physiologist V.M. Goryainov to the clinic to take an ECG, and biologist V.P. Demikhov in the "human" operating room (paraphrase of B.A. Petrov's words) to transplant organs? And who will be solving the issues with the forensic authorities about using corpses to maintain the organs

viable before transplantation? And who will revive the "brainless" all-around-the clock, provide care for the revitalized bodies and take samples from them for tests for the sake of organ transplantation to "needy patients"? And in aseptic conditions too? And who will nurse and care for the patients with transplanted organs and in which department? After all, everything that concerned the clinic and the treatment of patients was beyond the professional capabilities of V.P. Demikhov. And all that was not envisaged by V.P. Demikhov's plans. There is neither mention of whether he had discussed his plan with M.M. Tarasov, the Director of the Institute, or with Professor B.A. Petrov, the Chief Surgeon.

The plan also contained the clause about the implementation of direct myocardial revascularization according to V.P. Demikhov's technique, which, however, for some reason was limited to ... a continuation of experimental studies:

"In the Laboratory headed by V.P. Demikhov, it is planned to explore the possibility of using a coronary-mammary anastomosis for the treatment of coronary circulation insufficiency in the clinic.

Coordinator and implementer: V.P. Demikhov and P.I. Androsov.

The technique of coronary-mammary anastomosis was developed in 1953.

The objective: To improve it in experiments on human cadavers, including that with the use of vessel-suture devices" [1, p. 126].

After reading this, we can only ascertain that in 1961 V.P. Demikhov and P.I. Androsov were yet planning to perform a surgery of coronary-mammary anastomosis in clinic, after having worked it out on corpses. But nothing came of that idea.

It is known that at about the same time, V.I. Pronin and L.S. Zingerman made attempts to make a similar anastomosis in clinic at the Institute of Cardiovascular Surgery of the USSR Academy of Medical Sciences. The technique similar to that of V.P. Demikhov was developed, and the patient-candidates were selected. But the surgeons could not perform the operation to any of the patients because of the marked calcinosis of coronary arteries below the site of their occlusion. And then, Professor A.A. Busalov, the Director of the Institute of Cardiovascular Surgery forbade further "experiments" on humans because of their mortal danger. After that, V.I. Pronin ceased working in cardiovascular surgery, left the Institute and became involved in surgery of the stomach, and L.S. Zingerman got to catheterization of the cardiac chambers and cardiac vessels. After all, as Vladimir Ivanovich Pronin told the author, he *did not see any* prospects for coronary surgery at that time!

But let's return to the Meeting of the Scientific Council of N.V. Sklifosovsky Institute of February 1, 1961, considering that we have familiarized with V.P. Demikhov's 1960 report (in part) and with his working plans for 1961.

After the presentation, the speaker was asked the following questions:

"Moiseev S.G. (Dr. Med. Sci., Senior Researcher of the Therapeutic Clinic, the Chief Therapist of Moscow City Healthcare Department):

- How long do animals live after organ transplants?

Dashkovskaya V.S. (Cand. Med. Sci., Head of the Experimental Surgery Department):

- Dr. Demikhov conducts experiments on irradiated dogs in cooperation with the Biophysics Institute. We have no conditions for keeping such animals. We endanger the health of nurses who have to contact such dogs...

Petrov B.A. (Chief Surgeon of the Institute, Head of the 3rd Surgical Clinic):

- How many experiments have been done for seven and a half months of work and how many animals have survived?

Salakhedinova N.Kh. (Postgraduate of Trauma Clinic):

“Were there any changes in the brain of the dogs with transplanted organs?” [3, p. 8].

V.P. Demikhov answered, but very briefly and somehow uncertain:

"A total of 48 different experiments were made, 14 of which were for sternum transplantation (Fig.1, 2). I will report on the work with the Biophysics Institute after the work has been completed. Irradiated dogs are not dangerous. A dog with a transplanted head lived for 29 days" [3, p.8–9].



Fig.1. V.P. Demikhov is operating in the Operating Room on the 2nd floor of the Building for Anatomic Pathology at N.V. Sklifosovsky Institute. (1960s)



Fig. 2. V.M. Goryainov takes the operated dog. Pay attention to the tube sticking out of its mouth (1960s)

After that vague answer, the debate began. The first speaker was G.A. Vladimirovich, Cand. Med. Sci., the Academic Secretary of the Institute:

"Demikhov's studies are promising, but only in the sense that they would be applicable to humans. This is the goal of Demikhov's transfer to our Institute. And proceeding from this, we must approach to the assessment of his work. These studies should not be abstracted from the tasks of the Institute, but should be closer to its practical goals as the institution providing a large-scale surgical assistance to people with injuries of limbs, visceral organs, blood vessels.

The research conducted by Demikhov's Laboratory should correlate with the activities of a laboratory for organ harvesting and preservation. The members of the Scientific Council should be aware quite well that Demikhov's experiments on animals have reached the limit and put forward the research on immunology and biological compatibility as the main task. But these problems are too broad-scale to be developed by Demikhov's Laboratory within its staff resources, financial and logistics capabilities the Sklifosovsky Institute has.

It is necessary to determine the extent of these capabilities, and after that, to outline the topics of research [of the Laboratory] and their scope" [3, p. 9].

The idea of the Scientific Secretary was quite clear: V.P. Demikhov's research make sense only if they can be implemented into clinic. But simultaneously, they should correspond to the trends of the Institute research and, most importantly, to the Institute's resources. And since they correspond neither to the former nor to the latter, the scope and amount of research should be reduced. Moreover, as we have shown earlier with examples of the newly created Craniocerebral Trauma Department and the Anesthesiological Service taking shape in the Institute, Sklif had no real conditions for clinical transplantation of vital organs in 1961.

After the Academic Secretary, the floor was given to V.S. Dashkovskaya, the Head of the Experimental Department, who stated the Vivarium overload due to the increased number of experiments:

"<...> with Demikhov's arrival in the Institute, the number of dogs increased 3 times. Vivarium is extremely overloaded. Further overloading can lead to the disruption of the vivarium's functioning and the occurrence of epidemics among animals" [3, p. 10].

S.G. Moses, the internist, the author of the first question asked for the floor and proposed that V.P. Demikhov should pay attention to kidney transplantation:

"The transfer of Demikhov's Laboratory to our Institute is quite logical. The results of these studies should be introduced into clinic. But this can be

done only if the secrets concealing the problem of the organ biological incompatibility are uncovered.

If the surgeons of the Institute might be interested in limb and vessel transplantations, then we, internists, are extremely interested in the problem of kidney transplantation in poisoning with mercury-chloride sublimate" [3, p. 11].

The general opinion about the Institute's unreadiness to implement Demikhov's plans was summed up by M.M. Tarasov, the Chairman of the Council Meeting:

"The significance of Demikhov's Laboratory experimental studies cannot be underestimated. But they have reached their top, and the time came to translate them into the practice of treating the patients. That is the meaning of the Laboratory transfer to the Institute base. And we were so oriented by the Healthcare Authorities when the question of moving the Laboratory from the 1st MOLMI to our Institute arose.

And only in the perspective of further interaction with the clinic, Demikhov's Laboratory should secure the right to its further existence. This will take 2-3 years. Our task is to promote the scientific research of Demikhov's Laboratory. But at the same time, we should carefully monitor these studies. Look into their details.

The proposed plan is too extensive. It should be revised and changed, first, in line with the profile of the Institute, and second, guided by the capabilities for its implementation (staff, equipment, finance). And the latter depend on the USSR Ministry of Public Healthcare" [3, p. 11].

The meaning of the Director's speech was the same as that of G.A. Vladimirovich, "The experiments have reached the limit. It is time to translate them into practice." But how, when, and who will do it remained

unclear. The period of 2-3 years that the Director spoke about was too long for V.P. Demikhov. He was in a hurry, knowing quite well that he can be overtaken⁸. And his plan was drawn up in the hope that only its entire implementation could lead to achieving the goal: heart, lung or kidney transplantation to a patient in the next year or two.

"The plan must be changed on the basis of the subject and the Institute capabilities," the Director was not original in that. But further, he was more precise: "The staff, equipment, and funding depend on the USSR Healthcare Ministry". But that was already more than serious. The fact is that the Sklifosovsky Institute reported to the Moscow City Healthcare Administration, and the latter did to RSFSR Healthcare Ministry. But since the Demikhov's Laboratory transfer was authorized by S.V. Kurashov, the USSR Healthcare Minister, then, in M.M. Tarasov's opinion, it was necessary to ask for support from the USSR Healthcare Ministry. But that meant that the Institute had to apply to the Moscow City Healthcare Administration requesting them to apply to the RSFSR Healthcare Ministry, and they, in turn, to the USSR Healthcare Ministry; after that the USSR Ministry would make the decision to allocate "staff, equipment, and financing". Then their decision would come first to the Healthcare Ministry of Russia, and then to the Moscow Healthcare Department, and from there to the Sklifosovsky Institute. The path was long, but, unfortunately, M.M. Tarasov was unable to make it shorter.

The resolution on the matter discussed was as follows:

⁸ For example, a group of surgeons from the Experimental Laboratory (Leader W.B. Neptun), Thoracic Surgery Department (Head Prof. Ch.Ph. Bailey) of Hanemann Medical College in Philadelphia published an article on experimental orthotopic heart and lung transplantation in 1953 [4].

"1. To agree with the conclusions of the reviewers (most likely, that they were made in line with what M.M. Tarasov and G.A. Vladimirovich were talking about - SG).

2. To consider it necessary to revise the plan of Research Programme for the Organ Transplantation Laboratory, having set a Commission for this purpose consisting of: B.A. Petrov (Chairman) and members: A.V. Smolyannikova, I.I. Shimanko, V.P. Demikhov, I.M. Grigorovsky, and G.A. Vladimirovich.

3. Within 10 days, the Commission should submit their amendments into the plan of Research Programme for the Organ Transplantation Laboratory for 1961–1962 for the approval of the Scientific Council Presidium" [3, p. 11] .

Obviously, the Commission completed its work. V.P. Demikhov started working according to the abbreviated plan. So, for example, by the Institute Order of August 22, 1961, he was rewarded with a sum of money in the amount of the monthly salary "for performing the work *Plastic surgery on the coronary vessels*" [3, p.99]. However, clinicians did not hurry to use the results of that work.

On May 24, 1961, the Scientific Council of the Institute considered the "Report on the scientific, medical, and teaching work of the Therapeutic Clinic of the Institute for 1960 and the planning for 1961". That was, in fact, a cardiology clinic, because 51.5% of patients treated in it suffered from heart valvular defects, myocardial infarction, coronary insufficiency or hypertension disease. However, there was no information about the development of surgical techniques for coronary disease treatment either in the Report or in the Plan of Professor L.P. Sukhinin, the Head of the Department. B.A. Petrov, the Chairman of the Council even scolded him: "There are so many patients with myocardial infarction at the Institute; I

would like the internists and surgeons to work in closer contact!" [3, p. 56–59].

On June 7, 1961, "The report on the work of the Experimental Laboratory for 1960 and the planning for 1961" was heard at the Meeting of the Institute Scientific Council. In the archives, there are no texts of the report made by V.S. Dashkovskaya, the Head of the Department, and co-report made by A.S. Sidorkin, the Head Doctor of the Sklifosovsky Institute. But there are transcripts of speeches made by Meeting participants. The first who took the floor was K.S.Kovalskaya who was in charge for the Vivarium in the Laboratory:

“<...> Vivarium is small, only for 30 dogs. It has no electricity, kitchen, gas, refrigerator, camera for dead animals, premises for quarantine. There is no room for animal autopsies. There is no isolator. There are not enough facilities and staff to attend for dogs. We do not even have facilities for cooking food..." [3, p. 74].

But after all, there was only one vivarium for two laboratories! And how could it be possible to keep dogs with transplanted heart and lungs under such conditions? The Laboratory staff would be happy to help the colleague, but their capabilities were limited. And here I recall the legends of how V.P. Demikhov brought the dogs he had operated on to his home and nursed them there! And indirectly, Vladimir Petrovich himself also confirmed the absence of conditions for the full-scale work:

"I would like to add a proviso to Sidorkin's report. Our Laboratory works separately from the Experimental Lab. The protocol log is always kept.

We make histology examinations, and autopsies are performed in all the animals.

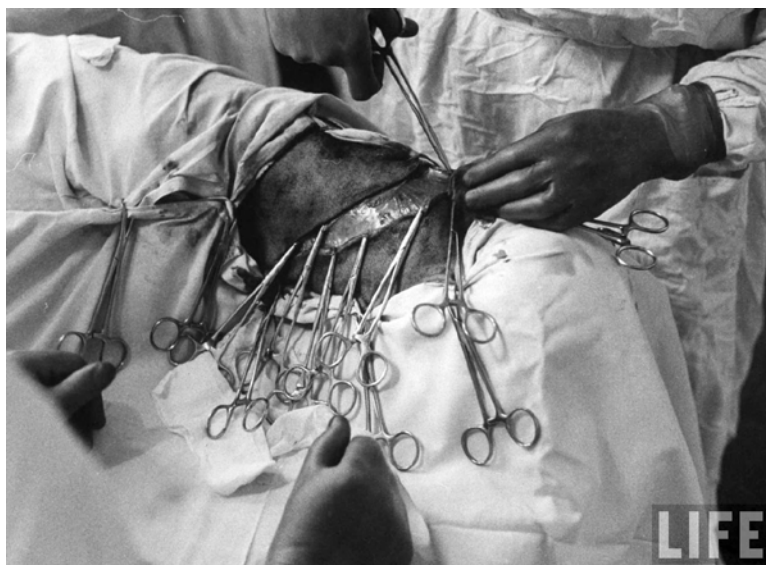
Our Institute needs a decent experimental base and appropriate rooms for the animals in the postoperative period. A pharmacy poorly provides our Laboratory with medical supplies, often there is not enough oxygen" [3, p. 75].

A.S.Sidorkin expressed his remarks on V.P. Demikhov's work:

"... I did not check Demikhov's Laboratory, but based on the inspection of the Experimental Laboratory, I got convinced that the descriptions of the operations made by Demikhov are extremely concise (Fig. 3, 4). This Laboratory is obliged to provide the data on operations into the Experimental Laboratory Log" [3, p. 75].

The next speaker was G.A. Vladimirovich:

"The experimental research work of the Laboratory takes an important place in the scientific activities of the Institute. The amount of its work is increasing ... But when drawing up the subject matter of the plan, the Scientific Council cannot get the exact information from the chiefs [of clinical subdivisions] about how much experimental dogs, cats, rabbits, medicines are needed for experimental studies ... " [3, p. 75].



**Fig. 3. V.P. Demikhov is operating: thoracotomy (1960s).
LIFE magazine's photo**



**Fig. 4. V.P. Demikhov is operating: local anesthesia (1960s).
LIFE magazine's photo**

A Candidate of Medical Sciences E.N. Popov found it possible to criticize the Institute Management:

"The Scientific Council should be conscious of the prospects of the Experimental Laboratory. We need to know what the Management intends to do to improve the work of the Laboratory?" [3, p. 76].

Such mutual criticism suggests that the Institute Management was well aware of the Experimental Laboratory problems and limited resources. This is evidenced from the words of B.A. Petrov:

"Despite the difficult conditions, the Experimental Laboratory makes a great and useful job ... Demikhov's Laboratory uses a large number of dogs ... <...>.

We need to establish a clinic for experimental animals in the Laboratory... " [3, p. 76].

M.M. Tarasov supported his Deputy:

"The work of the Experimental Laboratory has grown and improved many times, and its conditions are not favorable enough. They need to be improved. With the completion of the renovation in building No. 2, the Laboratory will be provided with new premises... "[3, p. 76].

After the debate had been completed, the Resolution was adopted that related both to the discussed issues on the work of V.S. Dashkovskaya's Laboratory, and V.P. Demikhov's Laboratory:

"In view of the increased scale of experimental research and the inability of the premises of the Experimental Department and the Vivarium to meet the growing demands, M.M. Tarasov, the Director of the Institute, shall be requested to issue an order:

a) For the expansion of the Experimental Department premises to create normal working conditions;

b) For the expansion of the Vivarium premises ... and the creation of normal conditions for the functioning of the clinic for experimental animals and their clinical observation in the postoperative period;

c) For allocating the Vivarium into a separate structural unit with its own staff headed by the Chief, a Veterinarian" [3, p.76].

1961 was coming to an end. The public euphoria of the first Soviet cosmonaut flight into space (Fig. 5) had already calmed down, and the construction of a concrete wall was begun in Berlin, which divided Germany into two countries for many years and Europe (symbolically) into two camps (Fig.6). USA deployed their medium-range missiles in Turkey and the Soviet Union deployed their missiles in Cuba, which became the cause of the Cuban missile crisis the following year. The first American in the world with mammary-coronary anastomosis died; and V.I. Burakovsky and N.M. Amosov operated on the first patients in their country with the cyanotic form of Fallot's tetrad.



Fig. 5. Greeting Yu.A.Gagarin (Moscow, April 14, 1961)
 [https://www.liveinternet.ru/photo/4258490/post20455015]



Fig. 6. The start of the Berlin Wall construction (Berlin, August, 1961) [http://toberlin.ru/berliner-mauer]

In December, 1961, the Institute named after N.V. Sklifosovsky summed up the results for the year. The Anesthesiology Department was arranged within its structure, it was headed by B.G. Zhilis; and the word "revitalized" disappeared from the name of V.P. Demikhov's Laboratory. From then, it was called, as it used to before, "*Organ Transplantation Laboratory*".

The Scientific Council increased from 31 to 36 members, and included V.S. Dashkovskaya as the member from the Experimental Laboratory.

The Institute still was working at three main scientific topics: trauma and traumatic injuries (that research group admitted in and treated about 25% of all injured in Moscow), diseases of the digestive system, and the cardiovascular system diseases (hypertension, myocardial infarction, and coronary insufficiency). In addition, the studies were carried out on malignant neoplasia, transfusion of blood and blood substitutes, and some other topics.

V.P. Demikhov's research covered the problems of injury (organ transplantation), treatment of coronary insufficiency (bypass surgery), and blood transfusion (sternum transplantation). However, neither report of any Institute Department working on those topics, mentioned any information about their cooperative work with the Organ Transplantations Laboratory in 1961. And the Report on the research of the 4th Surgical Clinic contained a review of the thesis on "Surgical treatment of chronic coronary insufficiency by using omentocardiopexy". We recall that the Clinic was headed by P.I. Androsov who was listed in the working plan of V.P. Demikhov's Laboratory as co-implementer on the topic "The study of possible using a coronary-mammary anastomosis for the treatment of coronary insufficiency in the clinic". We believe that it is unlikely that an outstanding vascular surgeon considered omentocardiopexy as more effective than a direct anastomosis, but the absence of permission from the Moscow City Healthcare Department to perform mammary-coronary anastomosis operations in the clinic hampered its implementation. Therefore, their joint work with V.P. Demikhov implied the improvement of the experimental operation only...

The ambulance sector did a lot of work during the year (Fig. 7), but neither point of the Report said about the delivery of corpses for revitalization of their organs. Meanwhile, 696 corpses were delivered to the Blood Transfusion Laboratory during the year, 1180 liters of blood were taken from them (Fig. 8). From 26 corpses, 368 grafts were harvested, including 194 ampoules with skin, 134 ampoules with bone tissue, as well as cartilage, fascia, and half-joints. The main methods of preservation were freezing and lyophilization. But none of 696 cadavers were delivered to V.P. Demikhov's Laboratory. Why? Apparently, he never got an awaited permission from the Healthcare Authorities for organ harvesting for transplantation.



Fig. 7. An ambulance car is running to an emergency call (Moscow, Leningradsky Avenue, 1950s, 1960s)

[https://retromap.ru/show_pid.php?pid=44181]



**Fig. 8. Preparation of cadaveric blood at N.V. Sklifosovsky Institute
(1960s) [<http://www.divilkovskiy.com/tarasov>]**

There is no information in the Institute Report about any achievements of Organ Transplantation Laboratory. Perhaps, because the working plan for the Laboratory was adopted in early 1961 for a period of 2 years, and the planned studies had not yet been completed by that time.

True, the Institute Report said that at one of the medical conferences, V.P.Demikhov made a presentation on experimental heart transplantation and on the methods of cardiac massage. But, looking ahead, we had to say that it was his first and last presentation for the doctors of the Institute.

(To be continued)

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