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PHENOMENON OF DEMIKHOV.
At the Sklifosovsky Institute (1960-1986).
Doctor of Science − inexplicable oblivion − scientific horizons.
The start of clinical transplantation in Russia (1964–1965)

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The article covers V.P. Demikhov work and activities at N.V. Sklifosovsky Research Institute for Emergency Medicine in 1964-1965. On May 28, 1964, V.P. Demikhov defended his Thesis for the Degree of the Candidate of Biological Sciences at the Biology Faculty of Moscow State University. But on the proposal of his opponents, Professor P.I. Androsov and

Professor A.E. Gurvich, he was awarded the Degree of the Doctor of Biological Sciences at a second vote. On September 12, 1964, V.P. Demikhov was approved to the assignment of the sought Academic Degree by the Higher Attestation Commission at the Ministry of Higher and Secondary Special Education of the USSR. Unfortunately, the archival file of the Higher Attestation Commission on V.P. Demikhov's defending the Thesis has been lost. The present paper contains the recollections of M.M. Razgulov, an eyewitness of this Thesis defence, as well as the inexplicable facts on the missing information in the Academic Council documents of N.V. Sklifosovsky Institute for 1964-1965 about V.P. Demikhov's work and the activities of the Organ Transplantation Laboratory he headed in the Institute. It has shown that clinical transplantology in the USSR began on April 15, 1965, when the group of surgeons headed by B.V. Petrovsky performed a successful kidney transplant surgery in a human for the first time in this country. V.P. Demikhov did not participate in those events. In 1965, he was engaged in developing the problem of establishing a bank of functioning organs connected to a living organism.

Keywords: history of transplantation, V.P. Demikhov, 1964-1965

During 1963, the staff of N.V. Sklifosovsky Institute continued traditional research and developments of problems in fields of trauma surgery, abdominal diseases, hypertension disease and acute coronary insufficiency, cadaveric blood preparation and transfusion, procurement and transplantation of cadaveric tissue (bone fragments, skin flaps), gynecological diseases, malignant neoplasms, organization and improvement of rendering emergency medical care. According to the planned Research Programmes, among the new topics being investigated, there were issues of neurosurgery, surgical care for acute occlusions of

main vessels, anesthesiology and intensive care, and the treatment of acute poisoning.

Though experiencing some difficulties, the research laboratories and scientific assist departments of the Institute worked in their usual rhythm:

> "The laboratories and the research units of the Institute, with some exceptions (the Experimental Laboratory), operate in well-equipped rooms and are relatively well supplied. However, we must admit that due to the increasing requirements to scientific research and medical work of the Institute, the tools and equipment available on its arsenal are insufficient, and is outdated in a number of laboratories. It results in some difficulties that are often encountered in the efforts to carry out both therapeutic-and-diagnostic and research work at a proper up-to-date level..." [1].

It should be noted, however, that in 1963, the Organ Transplantation Laboratory was not mentioned as a co-investigator in any report of any clinical or research unit of the Institute. The Institute documents contain not a single reporting Research Topic Sheet of the Laboratory. There is no mention of the Laboratory and its research in any Minutes of Academic Council Meetings. Neither a single scientific article nor a single scientific report came out of the Laboratory. There is none of it among the structural divisions of the Institute. How could that have happened?

We have no exact answer. However, as we showed in two previous articles, perhaps, V.P. Demikhov did not conduct any experiments in 1963. First, because from February to November, his Laboratory was inspected by the USSR Healthcare Ministry Commission chaired by V.I. Burakovsky [2, 3]. Second, that year he received a proposal from Germany to publish his book "Experimental Transplantation of Vital Organs" in German, and he was working at the author-edited translation

version and the Preface, which were published in late 1963 [4]. And third, V.P. Demikhov finally began to prepare the Thesis, which he intended to submit to the Dissertation Council of the Biology Faculty of Moscow State University, seeking for the Degree of the Candidate of Biological Sciences.

Candidate or Doctor of Science?
Medical or biological?

The year of 1964 began with a world sensation. On January 23, J. Hardy from the University of Mississippi (USA) performed the world's first chimpanzee heart transplant to a human. However, the patient with the monkey heart transplant did not live long. The heart could not cope with the hemodynamic load and arrested [5]. Did V.P. Demikhov know about that surgery? Most likely not. Because in winter and spring of 1964, he was interested in other problems.

Myths and legends about V.P. Demikhov's life and work are connected, among other things, with the fact that even archival documents sometimes contradict each other, misleading the researcher who discovered them. So, in the lists of the staff employees of the N.V. Sklifosovsky Institute for 1962-1964, there are erroneous and inaccurate information about V.P. Demikhov's date of birth, position, academic degree, and the time of employment.

So, the list of staff employees of N.V. Sklifosovsky Institute for 1962, stated that V.P. Demikhov had the Degree of the Candidate of Medical Sciences [6]. As of March 1, 1964, it follows from the Institute’s full-time staff form that he was not a biologist, but a surgeon, and that he had no academic degree [7]; and we read in the list of staff employees dated November 1, 1964, that V.P. Demikhov had a Doctoral Degree in Medical Sciences [8]. What is true?

Indeed, in 1964, 48-year-old V.P. Demikhov defended his Thesis for the Academic Degree, but not in medical sciences, but in biological sciences, and not the Candidate Degree, but of the Doctoral one.

And then a story begins, in which so far there have been more questions than answers. As said Dr L.A. Buzinova (Tushmalova)[1], the Candidate of Medical Sciences who had worked in the 1960s at the Department of Operative Surgery and Topographic Anatomy of the 1st MMI named after I.M. Sechenov, V.P. Demikhov's Thesis for the Candidate Degree was ready as early as in the 2nd half of the 1950s, when he worked at that Department. But when he brought the manuscript to Professor V.V. Kovanov, the Head of the Department, the latter was indignant. For, the chapters of the Thesis (as L.A. Buzinova said) were titled as follows: “Heart transplant”, “Lung transplant”, “Head transplant”, etc.; the Manager’s indignation was understandable: each chapter individually had the weight of a dissertation, so he (again from L.A. Buzinova's words) asked V.P. Demikhov to redo the work, with significantly reducing it. But V.P. Demikhov refused and handed the manuscript to Medgiz Publisher's. It is known that in1960, the manuscript was published in the form of a monograph titled “Experimental Transplantation of Vital Organs” [2], where the chapters were really entitled something like L.A. Buzinova told us: “Transplantation of the

[1] In the 1970s, she was the Head of the Department of Congenital Heart Diseases in Infants in the Bakulev Cardiovascular Surgery Institute of the USSR Academy of Medical Sciences; in the 2000s she was the Deputy Director of the Bakulev National Research Center for Cardiovascular Surgery of the Russian Academy of Medical Sciences.

[2] The reader may have three questions: 1) why V.P. Demikhov rejected V.V. Kovanov's proposal; 2) Why his manuscript was accepted by the Central Medical Publisher's of the country; 3) Who contributed to its publication? It is difficult to answer these questions, since only V.P.Demikhov knows the answers to them. But we can still assume the following: by 1960, he had accumulated the material adequate for several dissertations, so he did not see the point to defend a Thesis on transplantation, say, of the heart only, without to publishing the data on other organ transplants. It's either everything or nothing. Understanding that V.V. Kovanov will not allow it him to use the whole material for defending his Thesis, V.P. Demikhov decided to submit the manuscript to Medgiz Publisher's. Obviously, we will never know why his book was published, and who contributed to it. But his fame in his country and abroad after two trips to Germany in 1959 was such that his name could work for him. In addition, as stated in the Preface, the Editorial Board considered it appropriate to remind of their differences in views with the author.

second, additional heart", "Replacement of the heart and lungs", "Replacement of the heart only (without lungs)", "Transplantation of lungs (without heart)", "Renal transplantation", etc.

We believe that, changing the place of work from the Department of the 1st MMI named after I.M. Sechenov to N.V. Sklifosovsky Institute to the position of the Head of the Research Laboratory, V.P. Demikhov again tried to get an academic degree. This follows from the fact that, first, his Thesis was almost ready; second, in 1962, he already wrote about himself in documents, that he was the Candidate of Science; and third, in order to be elected on a competitive basis for the position of the Head of a Research Laboratory in a Research Institute, a candidate had to have an academic degree. Let us note an illustrative detail: despite the fact that the author of the Thesis worked at N.V. Sklifosovsky Institute, there was no approbation of the results at the Institute. It is known that the authors of the Theses issued from Institute departments passed approbation at a Meeting of its Scientific (later named as Academic) Council. But the Council Minutes contained neither V.P. Demikhov's Report, nor even a message that he had prepared a Thesis. This astonished us too, but it is the fact.

Nevertheless, according to the Registry of the State Archives of the Russian Federation (GARF), Archive stock R-9505 (storing Documents of the Higher Attestation Commission at the Ministry of Higher and Secondary Special Education of the USSR) contains Inventory book 66 (Biological Sciences, from 1936–1984) referring to file 7782 titled "Demikhov Vladimir Petrovich", established on May 28, 1964, and completed on September 12, 1964. The file, as stated in the Registry, contains 100 pages. However, there is no file per se in the GARF. According to the Head of the Reading Room, that file, along with other

files of Inventory book 66, was put into waste paper and destroyed in the second half of the 1980s.

Moreover, the Thesis, that had to be printed in several copies, could be found neither in the Library of Moscow State University, nor in the Russian State Library (RSL). As O.V. Demikhova[3] informed us, one copy of the Thesis was kept in the family; but after V.P. Demikhov death, it was passed on for storage to the RAMS Museum on Sukharevskaya Square. As it is known, this Museum was closed in the late 1990s, its collection was stored for a long time at N.V. Sklifosovsky Institute, and later on, in the building of the Presidium of the RAMS in Solyanka Street. The successor of this Museum was the Russian Museum of Medicine, a Department of the National Research Institute of Public Health named after N.A. Semashko. But there is no V.P. Demikhov's Thesis in the collections of this Museum.

Since the file was created on May 28, 1964, it is obvious that this was the date of the Thesis defence, and September 12, 1964, was the date when the nominee was approved to the assignment of the sought Academic Degree. But to what Degree, and in what specialty? As we showed above, in March 1964, V.P. Demikhov did not have an academic degree, and in November 1964, as was said in the list of the Institute staff [8], he already became a Doctor of Medical Sciences. But a biologist who defended his Thesis at Moscow State University could not get a Degree in Medical Sciences. It remains to be assumed that after his Thesis defence he was awarded the Degree of the Doctor of Biological Sciences. It is just to assume, for, first, we have never written about this yet, and second, the narrative in this article has not yet reached the point of the Thesis defence.

[3] V.P. Demikhov's daughter, Doctor of Medical Sciences, Professor, who works at the Central Research Institute of Tuberculosis.

According to O.V. Demikhova, the Thesis paper was titled the same as the monograph (“Experimental transplantation of vital organs”), it was rather large, printed with a typewriter on yellowed paper, and had a dark blue calico cover. In other words, it was the same work that V.V. Kovanov “rejected” at one time. If this is so, then its defence as the Thesis for a Candidate academic Degree was indeed a heated discussion.

This is how M.M. Razgulov, Dr of Med. Sci., who had been one of V.P. Demikhov's students recollected about it:

> “And then came that remarkable day. In a huge hall with rows of seats rising up, all the seats were occupied, and the aisles between the rows, too. Loudspeakers were installed in the lobby, and people stood there too. <…> The Chairman of the Academic Council of Moscow State University read out the basic data on the applicant seeking for the Degree, reviews and recommendations, and gave the floor to Demikhov.> <…. Demikhov went to the podium (Fig. 1), applause sounded in the hall and many people stood up. The Chairman of the Academic Council interrupted them and said that it was not a concert hall.

Fig. 1. V.P. Demikhov is speaking at the Thesis Defence Session. May 28, 1964

Demikhov in a confident voice told about half of the work he had done to create a cardiopulmonary complex, a heart transplant with the lungs, showed 10-15 schemes for a second heart transplantation, etc. Exactly 20 minutes later, Demikhov completed his presentation. Applause reappeared in the hall. Impressed scientists rose from their seats and applauded for a long time, despite the remarks of the Chairman.

Then suddenly a poet stepped on the scene and without any permission read a poem dedicated to the brilliant scientist, discoverer V.P. Demikhov. Neither we, nor Demikhov knew him. With difficulty, almost with a scandal, the poet was put back to his seat. But he was also applauded.

“Are there any questions regarding Demikhov’s speech?” the Chairman asked the audience. We were wary, looking at the 2nd and 3rd rows on the left, where the representatives of the “opposition” were sitting, and were determined to repulse them. But there were no questions.

Then the floor was given to the official opponent, Professor Pavel Iosifovich Androsov, Doctor of Medical Sciences, an outstanding abdominal and vascular surgeon, one of the co-authors of the vascular circular stapling device (ASC) and a great admirer of Demikhov's research. Androsov said that this work was worthy more than a Candidate Degree, and each of its chapters is worth of awarding a Doctor's Degree to Demikhov. And there were seven such chapters. He noted that all the ideas of the Applicant would find a clinical application in the next 10-15 years. And the opponent suggested that the Academic Council should provide another 20 minutes to the Applicant for the defence of a Doctoral Thesis.

The second opponent, Professor Aron Evseyevich Gurvich[4], Doctor of Biological Sciences, completely agreed with Professor Androsov. Demikhov had previously assumed that this would be so, and prepared a second report on the developments not included in the first one.

[4] One of the founders of Soviet immunochemistry; from 1961 to 1986, he headed the Laboratory of antibody chemistry and biosynthesis at N.F. Gamaleya Research Institute of Epidemiology and Microbiology.

Voting ballots were handed out to the Academic Council members, and soon the Chairman of the Counting Committee announced that everyone voted “yes”, there were no spoiled ballots.

Then Demikhov was given another 20 minutes of time, but that time to defend a Thesis for the Degree of the Doctor of Biological Sciences.

During a short break, when the Counting Committee counted the votes, the opponents of Demikhov left the hall. They realized that they had lost. If any of them spoke out against Demikhov, then they would not have been greeted.

By the way, many of those who were sent to this Thesis defence Session did not really know well the work of the Applicant. They were only told that Demikhov did not recognize immunology, but was only a tech guy and a dreamer. And when they learned from his first speech about his contribution to transplantology, many of them changed their minds. <…>

After 20 minutes, Demikhov completed his second presentation. The audience applauded him standing.

Opponents spoke again, and the Counting Committee announced that all members of the Academic Council of Moscow State University voted in favor of applying to the USSR Higher Attestation Commission to award Vladimir Petrovich Demikhov the Academic Degree of the Doctor of Biological Sciences. <…>

We, the students and friends of Vladimir Petrovich, came out with flowers onto the stage and wholeheartedly congratulated him on his victory. It was a rare case when someone could be awarded simultaneously with a Candidate and Doctoral Degree for 40 minutes, or more precisely, in two times of 20 minutes.

It was a fantastic defence.

Then there was a banquet in the dining hall of Moscow State University. There were many toasts with congratulations to the hero of the occasion. And one toast was made by Vladimir Petrovich himself for the assistants in his work. He addressed everyone by name and asked them to stand up. They were: Vladimir Goryainov, a Junior Researcher who worked with Demikhov from 1947 until the last days of the Laboratory; Elena V. Kolobanova, a Senior Nurse; Lilia Minina, an Operating Nurse, Igor

Belyanin, Galina Rozhkova, Sasha Gorokhov, Laboratory assistants; Sasha and Mikhail Razgulov, Hospital Attendants" [9].

On September 12, 1964, the Higher Attestation Commission at the Ministry of Higher and Secondary Special Education of the USSR approved the assignment of the Academic Degree of the Doctor of Biological Sciences to V.P. Demikhov.

Justice seemed to triumph. Finally, V.P. Demikhov had undeniable world recognition: the whole world learned about his operations that he had demonstrated in Germany thanks to television and newspapers[5], his book had been translated into English and German, he was awarded the Degree of the Honorary Doctor of Medicine from the University of Leipzig.

V.P. Demikhov was "recognized" by the USSR Healthcare Ministry, which Committee approved his work and recommended expanding and intensifying it. He was recognized by the Higher Attestation Commission, awarding him the Degree of the Doctor of Biological Sciences. Logically reasoning, now they should have recognized him at his native N.V. Sklifosovsky Institute.

Inexplicable oblivion

In 1964, the Scientific Council of the Sklifosovsky Institute was renamed into the Academic Council. The Council worked in its own regime, V.P. Demikhov did in its own (Fig. 2). He was not a member of the Scientific Council, and therefore he did not attend its Meetings if he was not interested in the topic under discussion. Even when he attended them, he listened to the speakers silently, without asking questions (Fig. 3). The Council "paid" him back the same: not a single report on the

[5] C. Barnard, for example, learned about V.P. Demikhov from a morning newspaper in spring of 1959.

Organ Transplantation Laboratory work was on its agendas either in 1962, or in 1963, or in 1964, but as we shall see later, and nor in subsequent years[6].

Fig. 2. V.P. Demikhov in his office. 1964

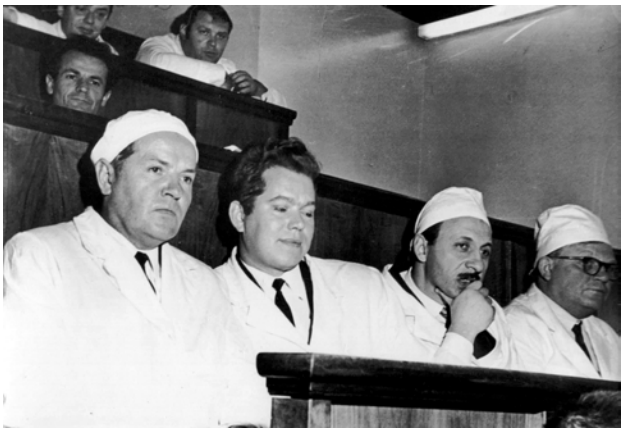

Fig. 3. At the Meeting of the Academic Council of N.V. Sklifosovsky Institute (from left to right): V.P. Demikhov, M.M. Razgulov, Prof. I.I. Shimanko, Prof. P.N. Petrov

What did the Council do? At its Meetings, held once a month, as a rule, various Institute departments presented the reports on their clinical work, research and developments and also the applicants seeking for the

[6] As should be noted, at least one Report did take place. In May 1966, V.P. Demikhov briefly presented his research at the Session of the Institute Academic Council. But, that report came out of schedule, as the next article will show. In fact, it was V.P. Demikhov who initiated it when he nominated himself as a Corresponding Member of the USSR Academy of Sciences. The text of the article refers to the fact that no planned Reports on V.P. Demikhov's work were included in the Council's Working Plans in the 1960s.

academic degree made presentations of their Theses for approbation (a positive assessment). So, shortly after defending the Thesis by V.P. Demikhov, on May 27, 1964, the Academic Council of the Institute listened to the presentation made by the Candidate of Medical Sciences L.L.Gugushvili on the topic “Surgical anatomy of hepatic veins and pathology of the liver blood circulation" prepared as a result of his research for his thesis for the Degree of the Doctor of Medical Sciences.

The study was performed on 320 human corpses, and its experimental part was made on 110 dogs. The vascular architectonics of the liver was studied, intrahepatic vascular anastomoses were discovered, an original concept of the portal hypertension pathogenesis was created, and a technique for making portacaval anastomosis and an omentohepatopexy operation for its treatment were developed. Most likely, the experimental part of the Thesis was made based on V.P. Demikhov-headed Laboratory and with his help, but there was no mentioning about it in L.L. Gugushvili's presentation[7].

On July 1, 1964, there was an approbation (presentation for a preliminary positive assessment) of the Thesis for the Candidate Degree on the topic “Plastic surgery for fresh injuries to arteries, and aneurysms of blood vessels” prepared by V.R. Anakhasyan, a student of Professor B.A. Petrov, the Institute’s Chief Surgeon. The author had studied 499 case histories of the patients undergoing vascular suture procedure or plastic surgery on blood vessels[8] and reviewed 300 arteriograms over the previous 23 years. In most cases, autologous tissue was used for grafting; in a number of patients, homo vessels and prostheses of dacron, lavsan, and kapron were used. Thesis approbation was a success. The Thesis was

[7] After defending his Thesis, L.L. Gugushvili began working in the Laboratory headed by V.P. Demikhov.

[8] Vascular suture surgery at N.V. Sklifosovsky Research Institute was implemented in clinical practice in 1950. Until that time, bleeding from the main vessels had been stopped by ligature.

recommended for defence. The main remark made by B.A. Petrov was little attention of the Applicant's to the mechanical suture technique.

It is appropriate to recall here that by 1960, V.P. Demikhov had had personal experience of applying 500 circular vascular sutures (aorta, pulmonary, carotid and subclavian arteries) in experiments while performing heart transplantation, the experience of forming coronary anastomoses, their patency being confirmed by coronarography; he (together with N.P. Petrova) had the priority of performing the country's first mechanical suturing operations that had been demonstrated in the GDR and FRG in 1958–1959. However, none of those were mentioned in V.R. Anakhasyan's report, either.

Scientific horizons

And V.P. Demikhov continued his work (Fig. 4). In the first half of the 1960s, many foreign surgeons visited his Laboratory (Fig. 5).

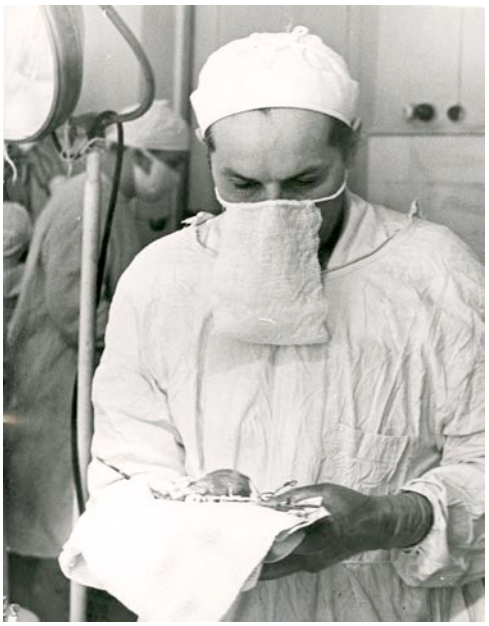

Fig. 4. V.P. Demikhov demonstrates a vascular stapling device. 1964

Fig. 5. V.P. Demikhov demonstrates an isolated heart to Dr. A. Lipmann-Kessel, Professor of the University of London (1914-1986). Photo by Y. Tikhonov, RIAN. 1963

On November 11, 1964, the long-term Prospective Plan of the Institute Research for 1965–1970 was discussed at the Meeting of the Sklifosovsky Institute Academic Council. The main report was made by Professor I.M. Grigorovsky, the Head of the Organizational and Methodological Department.

The main research trends in the Institute's activities for the next 5 years included 5 topics of "All-Union significance", traditional for the Institute (trauma and traumatism, physiology and pathology of digestive organs, hypertension disease, atherosclerosis and coronary insufficiency), and 2 new topics (surgery of the nervous system; anesthesiology and critical care), as well. The important issues, according to the speaker, were the following: coping with poisoning, protection of women's health, blood system diseases. A total of 97 topics were planned for a total of 195,100 roubles.

The Plan adopted at that Meeting was attached to its Minutes. But as for topic No. 28 "Trauma and traumatism", where we previously saw the

Research Topic Sheets of V.P. Demikhov's Laboratory, we did not find a single sheet on his research topics for that time. And what was there? There were: shock, injuries of the thoracic organs, wounds of the vessels, fractures of long tubular bones, and organizational issues.

But perhaps the issues of organ transplantation were included into topic No. 29 “Anesthesiology and critical care”? But there was nothing of the kind there, either. And in the topic of blood transfusion, there was not a single mention of sternum transplants developed by V.P. Demikhov.

What else? The issue of sudden cardiac death was included in the “Blood Transfusion” topic. Maybe it was planned to develop revitalization techniques by connecting to a cardiopulmonary bypass or to an artificial heart, which V.P. Demikhov was dealing with? Or a heart massage according to Demikhov? But the subtitle of the Topic was: "Clinical and anatomical parallels in sudden cardiac death from myocardial infarction". The only topic included in the R&D Plan for 1966 was the one entitled “Comparative evaluation of the functional capabilities of the coronary system of a normal and transplanted heart” (Investigator: N.M. Sharovskaya, Project Leader: V.P. Demikhov) [10].

Nevertheless, the Organ Transplantation Laboratory did not disappear anywhere from the structure of the Sklifosovsky Institute, V.P. Demikhov continued his work, and the Institute's administration, as follows from the documents, tried to somehow help him.

From the Memo on Institute activities addressed by M.M. Tarasov, the Director of the Institute, to the RSFSR Healthcare Minister, dated August 24, 1964:

> “p.10. The Organ Transplantation Laboratory was transferred from the 1st MOLMI and included in the structure of the Institute on the basis of the USSR Healthcare Minister Order...

The significance of this laboratory in the originality of the experimental studies conducted in it has gained fame that goes far beyond the USSR borders. Laboratory studies attract the interest of a large number of home and foreign scientists.

The Laboratory is headed by V.P. Demikhov, an outstanding experimenter, Doctor of the University of Leipzig. The Laboratory has proved the feasibility and expediency of temporarily and safely connecting revitalized organs (heart, lungs, kidneys) to the patients in need, instead of the artificial ones used now in clinical practice.

The Laboratory strives to achieve the possibility of replacing irreversibly injuried organs with healthy ones.

The Sklifosovsky Institute for Emergency Medicine, having a large Pathologoanatomical Department, is an institution where large numbers of patients in agonal state and also those dead are delivered to.

<…> Due to the fact that agonizing patients and just deceased are delivered to the Institute by ambulance at different times of the day, and the revitalization undertaken in the Laboratory can be effective in the first 2 hours after death, it is necessary to organize round-the-clock work of this Laboratory.>

For this purpose, 4 staffed teams on duty should be organized. Thus, in addition to the staff available in this Laboratory, the following staff is required:

1. Junior Researcher − 3
2. Forensic Examiner − 3
3. Head Nurse − 1
4. Housekeeping Nurse – 1
5. Medical Laboratory Assistant − 1
6. Hospital Attendant − 3” [11].

Against the line “Junior Researcher”, someone put a check mark in ink and wrote the number “1”. The same check marks were put against the "Forensic Examiner" and "Head Nurse", a dash was against the "Houskeeping Nurse." And that's about it.

Who made those corrections? Did the Memo reach the Minister? We do not know this, but, according to our data, no changes in the Laboratory staffing took place after that[9] (Fig. 6).

Fig. 6. In the experimental Operating Room.
On the right: V.M. Goryainov. 1960s

And here is another memo. It was filed in the archives immediately after M.M. Tarasov's memo, but for some reason it was dated two years earlier, January 23, 1962. It was wrote by V.V. Doroshchuk, being the Junior Researcher of the Organ Transplantation Laboratory at that time, and he addressed it to the Director of the Institute[10]. It says that the Institute needs a special department to be established that would be called "Clinic for maintaining and restoring the vital functions of the body in patients with terminal conditions" or have the name "Clinic for the treatment of terminal conditions", and a special building is necessary to be constructed for this purpose next to the Surgical one.

[9] In 1965, the following people worked in V.P. Demikhov's Laboratory: Galina Rozhkova (later on, Deviegos, Doctor of Medical Sciences, Professor of the University of Havana), students Mikhail M. Razgulov (later on, Doctor of Medical Sciences who worked at the Research Institute of Transplantation and Artificial Organs (NIITiIO) of the RF Healthcare Ministry, Igor Belianin (later on, Doctor of Medical Sciences, Researcher of Central Research Institute of Tuberculosis of RAMS), Andrey S. Akopyan (later on, Doctor of Medical Sciences, Director of the Center for Human Reproduction of the RF Healthcare Ministry.

[10] In 1963, V.V. Doroshchuk studied the issue of mechanical ventilation during anesthesia and in respiratory failure of various origin.

Together with this memo, another one was filed, dated January 20, 1962, signed by Professor I.M. Grigorovsky; it was about the organization of an Emergency Care Building at the Institute with the Unit aimed at "coping with terminal conditions and rendering critical care" [12].

From the text of these documents, it follows that the problem of creating a critical care service had already ripen at the Institute by 1962. And the clinical-experimental studies on revitalizing the corpses of those being the victims of wounds and injuries, delivered to the Institute; i.e. the studies that V.P. Demikhov planned to do, coincided with that problem. But, unfortunately, in 1964, nothing mentioned in the above documents was created.

Although the problem that in our country was under development by the Laboratory for Organism Revitalization of the USSR Academy of Medical Sciences under V.A. Negovsky guidance was already knocking on the door with might and main. In 1962, V.A. Negovsky announced the birth of a new medical science, Reanimatology, and at the Scientific Session held on November 28-29, 1964, at N.V.Sklifosovsky Institute he made a presentation entitled "Indirect cardiac massage in the treatment of terminal conditions caused by blood loss." But after all, M.M. Tarasov, and B.A. Petrov, and other employees of the Institute were well aware that they have a staff employee, Doctor of Biological Sciences V.P. Demikhov, who could have made the same report at the same forum, and who had been using that method for a long time to successfully revive his "tailed" patients. However, he did not speak at that Session.

By the way, in 1964, among more than 200 doctors and researchers of the Institute, there were only 10 Doctors of Sciences. And V.P. Demikhov was one of them.

The start of clinical transplantology in Russia (April 15, 1965)

From the Institute Report for 1965, we have learned that during that year, experimental surgeons in collaboration with clinicians performed physiological studies in the field of portal blood circulation and, using histological methods, investigated abnormalities occurring in the liver in various types of necrosis. The authors of these studies were not specified, but most likely, the studies were performed by L.L. Gugushvili, Dr. Med. Sci., in the Laboratory headed by V.P. Demikhov. But again, as a year, and two years ago, there was no mentioning in the explanatory note to the Plan about the work of the Organ Transplantation Laboratory in 1965. There was no V.P. Demikhov's surname in any Research Topic Sheet of any clinical or scientific department of the Institute. And there was not a single report at conferences, not a single presentation made at the Academic Council Meeting, not a single publication.

True to say, one Reporting Topic Sheet was filed to the Total Report. Its topic was "An experimental basis of the method for preserving a revitalized organism for organ transplantation and the use of cross blood circulation for medicinal purposes." Investigator was V.P. Demikhov. Project Leader was also him. Deadlines: beginning 1948(!); completion 1965.

And here is what was said in the summary describing the topic:

> “Entire organs cannot be preserved by freezing or drying, as is done for individual tissues (bones, blood vessels, skin). The best way (and so far the only way) to preserve the revitalized organs is the physiological method.
>
> The creation of cross blood circulation makes it possible to revitalize cadaveric organs and keep them in a vital state <...> In practice, this can be done as follows:>

When a patient with irreversible brain damage, but having a viable body, is delivered at the clinic, you might revive the heart in it, create artificial respiration, nutrition, special care, and in this way (in a thermostat at a temperature of +37 degrees C) maintain the body's life for a long time.

Vascular prostheses might be sutured to the femoral vessels of this revitalized body (without the function of the head), thanks to which the organs from other fresh corpses can be revitalized in the neighbouring compartments for long-term preservation of them in a vital state and for transplantation.

Many different organs can be connected to a single such body, which will physiologically provide self-service of the entire system (italics ours − S. G.).

Prostheses can be drawn from the system of revitalized organs to neighbouring wards, in which cross blood circulation will be used to perform open heart surgery, to maintain a living state of the body after removal of vital organs (until transplantation), and for other purposes.

In the experiment, we have shown the feasibility of maintaining the life of a body without a head, [and also] of many organs in compartments connected to the same body.

There were four hearts with lungs and with abdominal organs in 4 compartments that were connected to one dog. All organs in the compartments were functioning. The experiments were documented by shooting a popular science film in 1965.

Recommendations for implementation in practice: The above method of preserving revitalized organs can be put into practice" [13].

It follows from the text of the document that in 1965 V.P. Demikhov continued working actively at organ revitalization, the main topic, for which he had come to the Institute 5 years ago, and also advanced ahead. If earlier (in 1963), he only theoretically proposed to connect functioning or revitalized organs to a revitalized body, that time he said that he had done it in practice and was ready to implement the method in clinic.

Apparently, this is the first mention of establishing the country's first primitive "bank of organs", as well as of organizing a kind of "resuscitation department" with the biological apparatus of artificial blood circulation being the centre of it. But in 1965, some of V.P. Demikhov ideas that used to be advanced ones some day, but never being implemented in the Soviet Union, turned already hopelessly outdated.

As early as 10 years ago, W. Lillehei from the University of Minnesota (Minneapolis, USA), irrespective of V.P. Demikhov, used cross blood circulation for open heart surgery; and a year later J. Kirklin from the Mayo Brothers Clinic in Rochester (Minnesota, USA) implemented into the clinic an improved cardiopulmonary bypass, replacing a live human body in the operating room. But no similar “bank” of vital organs was created anywhere at that time. The era of heart transplantation had not yet begun. And here V.P. Demikhov was still ahead.

But keeping the supremacy became increasingly difficult. Even in his native country.

On April 15, 1965, the era of clinical transplantation began in the USSR[11]. At the Scientific Research Institute of Clinical and Experimental Surgery (NIIIKiEH) of the RSFSR Healthcare Ministry, a group of surgeons led by B.V. Petrovsky carried out the country's first successful kidney transplantation. The donor organ was taken from a related donor, and after the perfusion of its vascular bed, was transplanted onto the iliac vessels of the recipient, then the stump of the ureter was sewn into the bladder[12]. The surgery was performed successfully, but not up to the two-stage scheme that V.P. Demikhov once proposed.

[11] The first clinical kidney transplantation in the United States was performed on June 17, 1950. The Patient with the transplanted organ lived for 5 years.

[12] It is known that the first kidney transplantation in the USSR in 1933 was made by Yu.Yu. Voronoy from Kharkiv. But it was what transplantologists call an "engraftment" rather that transplantation, since

Thus, the train of Soviet clinical transplantology started off. Unfortunately, without V.P. Demikhov. Note that V.P. Demikhov, who had always taken an active life position in organ transplant issues until then, did not even try to jump on its footboard. In any case, he did not write any more letters to the Healthcare Ministry or Party Bodies, for example, requesting them to transfer his Laboratory to the NIIKiEH base. In any case, we are not aware of such letters.

In September 1965, Academician B.V. Petrovsky was appointed the Healthcare Minister of the USSR. And in 1971, five Soviet surgeons, pioneers of kidney transplantation, were awarded the USSR State Prize (Fig. 7). V.P. Demikhov was not among them. Did obvious disregard of his merits hurt his self-esteem? We have every reason to believe that it hurt.

But more about that is in the next article.

Fig. 7. The Laureates of the USSR State Prize of 1971 awarded “For the development and implementation of kidney transplantation in clinical practice” (from left to right): N.A. Lopatkin, Yu.M. Lopukhin, G.M. Soloviev, B.V. Petrovsky, V.I. Shumakov. November 7, 1971

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the kidney was "engrafted" on the hip vessels and was positioned outside the body for a temporary detoxification of the body after poisoning. Earlier we mentioned that a similar operation had been performed by V.P. Demikhov using his original "two-stage" scheme at the Botkin Hospital in Moscow in 1962. The kidney transplantation made by B.V. Petrovsky and colleagues has been considered the first one because the kidney was transplanted orthotopically and designated for a long period of functioning.

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