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FROM THE HISTORY OF HEALTHCARE

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SPECIFIC QUESTIONS IN THE HISTORY OF MEDICINE

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Returning the medical writings of surgeon and Bishop V.F. Voyno-Yasenetsky to scientific use

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The life and work of Russian surgeon and Orthodox bishop V.F. Voyno-Yasenetsky (1877–1961) is an example of the practical unity of the scientific and the religious. Such an extraordinary combination of fields has attracted the attention of our contemporaries, including medical students, junior doctors and even eminent scientists. Hundreds of articles and dozens of monographs, including some published in foreign journals, have been written about the life of this famous physician and bishop of the Russian Orthodox Church. Having said that, two of his medical works are widely unknown, including to domestic and European surgeons. They were published in the Deutsche Zeitschrift fur Chirurgie (Leipzig, 1923), and the author was listed as Lucas Bischof (Ger.). Very few people would guess today that Lucas Bischof was in fact the Russian surgeon Voyno-Yasenetsky, consecrated at the time as a bishop named Luke. These two articles by Voyno-Yasenetsky have been published for the first time in Russian. Each of them contains the results of the scientific discoveries he made. They include descriptions of a new anatomical structure, as well as two original surgical interventions. He wrote these works during the Tashkent period of his career (1917–1923).
The return of the works of Voyno-Yasenetsky to scientific discourse will contribute to the widespread recognition of his lesser known achievements which may eventually be named after him (including a surgery to remove the spleen, which he proposed as an addition to the Halsted operation and the newly described anatomical structure).

Keywords: *V.F. Voyno-Yasenetsky, «Deutsche Zeitschrift für Chirurgie», Lucas Bischop, priorities in surgery, priorities in anatomy, history of medicine*

The historical parallels that define the relationship between science and religion over the centuries have slowly but surely attracted the attention of Russian scholars. Recently, a group of historians, including faculty from the Department of the History of Medicine at I.M. Sechenov First Moscow State Medical University, have joined forces to shed light on two important works from the surgeon and bishop Valentin Voyno-Yasenetsky (1877–1961). Working within the framework of the history and philosophy of science, we aim to use a multidisciplinary approach in order to return the works of Voyno-Yasenetsky (known abroad as Lucas Bischof) to their rightful place as essential contributions to the history of science[1].

Many original works by this author were published in "*Deutsche Zeitschrift fьr Chirurgie*" (Leipzig, 1923), including "On the Suturing of Vessels during the Removal of the Spleen", and "The Necessity of Increasing the Operation Area for Operations Related to Malignant Breast Tumors" [1, 2]. Due to his arrest for political reasons and his subsequent exile to the regions of Krasnoyarsk and Turukhansk (1923–1925), the inaccuracy of a German translation could not be corrected by Voyno-Yasenetsky. The result of this inaccuracy has led to the current belief in Germany and in other countries of Western Europe that the Russian surgeon Lucas Bischof, a faculty member at the Institute for Topographic Anatomy and Operational Surgery at Tashkent University, was the inventor of the procedure for removing the spleen, as well as an essential addition to the Halsted operation[2]. In reality, Lucas Bischof and the chair of the institute, Valentin Voyno-Yasenetsky, were one and the same person. The second name can be

[1] Lucas Bischop: "Lucas" is the Christian name, and "Bishop" is the surname. This is inexact information regarding the surgeon Valentin Felixovich Voyno-Yasenetsky, who had become a bishop in the Russian Orthodox Church under the name "Luka (Yasenetsky-Voyno)" not long before his first arrest in 1923.

[2] Here we are referring to the surgical intervention proposed by Halsted in regard to malignant growths in the chest.

explained by the fact that Voyno-Yasenetsky had taken the rank of bishop (in German – Bischof) in the Russian Orthodox Church, and had been rechristened Lucas.

Due to their publication under the name of Lucas Bischof, it was difficult even for Russian surgeons to trace the scientific achievements, first reported in December 1923 in "*Deutsche Zeitschrift für Chirurgie*", back to the name of Voyno-Yasenetsky. Therefore, the breakthroughs of Voyno-Yasenetsky remained relatively unknown in his native land. For example, access to his work was so limited during the Soviet period that Soviet surgeons could only come into contact with his work through data published in foreign journals.

It took more than 80 years for these achievements to become well known in the Russian Federation. Voyno-Yasenetsky's work was briefly summarized in a scholarly monograph by Yuri Shevchenko [3]. It was assumed that the summary appearing in Shevchenko's monograph would lead to the publication of complete versions of the two articles of Voyno-Yasenetsky that appeared under the name of Lucas Bischof in the German journal of surgery "*Deutsche Zeitschrift für Chirurgie*" in 1923. However, its publication was involuntarily postponed for a considerable period of time. Eventually, the chance to publish the material arose in the research journal "*Istoriya Meditsiny*" (The History of Medicine), the first publication of its kind to appear in the Russian Federation. It is worth noting that the founding of the current journal coincides with the 90th anniversary of the publication of the famous scholarly work of "Lucas Bischof", or rather, the Professor from the University of Tashkent, Valentin Voyno-Yasenetsky, in the journal "*Deutsche Zeitschrift für Chirurgie*" [1, 2].

Professor of technical sciences M. Yurkin, together with his editor, Doctor of Medical Sciences Mikhail Kozovenko, authored the original translations of Voyno-Yasenetsky's work from the German.

It is necessary to provide some commentary to the work of Voyno-Yasenetsky's "On the Suturing of Vessels During the Removal of the Spleen". We draw attention to the consistency and sense of purpose evident in the work of the surgeon Voyno-Yasenetsky, who, in 1911, had a patient die as a result of a complication during a splenectomy. The painful memory of this tragic death led the doctor over the course of twelve years to establish a new and original method for removing the spleen, which avoided the possibility of severing its blood vessels during operation. This was a scientific breakthrough which reduced the incidence of surgical complications such as those which had arisen in the case Voyno-Yasenetsky had encountered in 1911, resulting in the death of the patient. In December 1922, when the experimental phase of the research had concluded, the surgeon and priest initiated a clinical phase of proper surgical intervention. Up to his initiation as a bishop in the Russian Orthodox Church and his resulting arrest, the surgeon and priest succeeded in performing only five surgical interventions. Their clinical (and a number of pathological-anatomical) results testified to the procedure's prospective use as an original method for removing the spleen, which would later be referred to as the Voyno-Yasenetsky method (1923).

In his work "The Necessity of Increasing the Operation Area for Operations Related to Malignant Breast Tumors" the surgeon and priest Voyno-Yasenetsky proposed a more radical modification to the generally accepted Halsted procedure. His modification involved creating more space by removing the lymph nodes from the chest-scapular area, identified for the first time by Voyno-Yasenetsky as the *Spatium toraco-scapulare*. Within this intramuscular space, he identified both the metastasis of malignant tumors and certain changes to the lymph nodes which indicated pulmonary tuberculosis. Thus, it would be appropriate to consider Voyno-Yasenetsky as the person who discovered the chest-scapular area.

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APPENDIX

From the Institute of Topographic Anatomy and Operative Surgery at Tashkent University
(Director: Professor Valentin Voyno-Yasenetsky)

On the ligation of vessels in spleen removal[3]

Lucas Bishop[4]

I removed a spleen for the first time in 1911 due to traumatic rupture. With the spleen still in my hand, as I began to suture the splenic artery, it suddenly burst and the abdominal cavity quickly began to fill with blood. I was able to quickly find the artery and suture it, but the patient died five days later due to necrosis of the large intestine.

During the autopsy, I discovered that the suture that I had hastily performed on the splenic artery had pinched the *Arteria colica media*, causing the colonic intestine to undergo necrosis starting from the splenic flexure and continuing to the sigmoid colon.

Then I set myself the task of exploring the issue of the preliminary suturing of the splenic vessels before removal of the spleen. Reviewing a large portion of literature on the subject, I failed to find a satisfactory solution to the problem, and so turned to the use of autopsies to conduct a topographic anatomical study of the splenic vessels. I soon came to the conclusion that it is not always possible to find the splenic artery in the upper edge of the pancreas, as from the perspective of its topography, the position of this artery varies considerably, often passing behind the pancreas. However, it is very important to keep in mind the fact that suturing the splenic vein at the point where it descends into the back wall of the abdominal cavity is virtually impossible. The impossibility of this procedure is due not only to the fact that the vein always passes into the abdominal cavity behind the pancreas, but also to the fact that this large vein has extremely delicate walls (the most delicate of the entire human body). Throughout the pancreas in the abdominal cavity, the walls of the splenic veins consist almost exclusively of an endothelial layer (*Intima*), and therefore it is extremely difficult to dissect a spleen during autopsy without damaging it. Thus, it is likely that the vein's deep and hidden position between the pancreas and the back wall of the abdominal cavity can be explained in terms of its being completely protected from injury and any type of harmful effect and not needing any special strengthening of its walls.

I wasn't able to get satisfactory results from my anatomical research on cadavers, and only a few times did I make successful attempts at preliminarily suturing the splenic artery through *Bursa omentalis*, but later, the spleen was removed repeatedly by traditional methods. I only recently achieved the task of suturing the splenic vessels (a task that earlier was to be avoided) with what appears to be great success. The method I used was extremely simple and easy to perform. Upon removal of the spleen, I performed the procedure as a pathologist. Thrusting both hands behind the spleen, I tore the *Ligamentum phrenico-lienale*, and pulled the pancreas along with the splenic tail out from the posterior abdominal wall. By this method, the isolated spleen was moved to the right, so it was possible to see the vessels passing into the area of the tail of the pancreas. It was possible to see them on the posterior surface at the top end of the tail of the pancreas where the splenic vein can be detected without the slightest effort. Its artery either becomes visible from above without any preparation at all, or is easily detected in the loose cellular tissue fiber. Here the vein is not covered by the pancreas. It passes freely and directly over the tail of the pancreas, having a

[3] Lucas Bischof. Uber das Unterbinden der Gefasse bei Extirpation der Milz. Deutsche Zeitschrift fur Chirurgie. Leipzig, 1923. Bd. 183. Dezember. S. 396–399.

[4] Voyno-Yasenetsky was both a surgeon and bishop, as well as professor in the Department of Topographic Anatomy and Operative Surgery in the medical school at the Turkestan State University in Tashkent (note of Mikhail Kozovenko).

significantly thicker wall than it does where it lies behind the body of the pancreas.

After the artery and the vein behind it have been quickly and easily sutured, the operation finishes with the suturing and dissection of the *Ligamentum gastro-lienale*. It is even possible to cut this ligament without tying it off first, as the *Arterie gastricae breves* bleed very little after the splenic artery has been sutured, and can be quickly clamped with hemostatic forceps.

At the beginning of the operation small difficulties may arise when severing the *Ligamentum phrenico-lienale* due to the delicacy of this ligament. It is then necessary to use scissors in one or two places. In addition to the extreme simplicity of the suturing of the vessels, the method I am proposing for removing the spleen has another major advantage. It does not require special incisions to gain access to the spleen. Thus, with a small number of incisions, the whole operation can be easily performed through a medial incision from the xiphoid branch to the umbilicus. It is only necessary to make a lateral incision across the left rectus abdominis muscle, or even further across the oblique and transverse muscle, when the spleen is swollen to a size larger than that of the indicated incision, is it necessary. All other incisions are believed to be unnecessary and are used only on rare occasions.

Over the course of the last six months, I have had the chance to use my method on five occasions, during which the following results were achieved.

Case 1. A young woman's spleen had hypertrophied from malaria, causing serious pain. At the time of the operation there was minor intergrowth of the spleen with the diaphragm, which was quickly dissected without any significant loss of blood. The spleen was moved to the side, at which point the splenic vein and artery were immediately visible. During the removal of the spleen from the diaphragm, the very loose fabric near the *Hilus* was damaged by the fingers of my left hand, which was holding the spleen. The rupture resulted in severe bleeding. After a suture was promptly applied to the *Arteria lienalis*, the bleeding quickly decreased. For the experiment the splenic vein was cut without a set suture in anticipation of the fact that, after suturing, it would not cause bleeding. This is in fact what happened: from the distal end of the vein there was absolutely no blood. Then, from the proximal end, blood began to quickly flow backwards from the portal vein. The vein was immediately sutured. The operation required very little time.

Case 2. This involved an unskilled worker of 34 years of age whose spleen ruptured during recurrent fever. There was profuse bleeding in the abdominal cavity. A long tear was detected on the bulbous surface of the significantly swollen spleen. Using my method, the spleen was removed quickly and easily without any loss of blood. The patient survived the surgery, however the fever worsened significantly. Complications from septic parotiditis and pyemia arose, leading to the death of the patient.

Case 3. An engineer of 38 years of age suffered a gunshot wound to the chest and stomach. There was a large quantity of blood in the *Bursa omentalis*. The spleen had been split almost in two pieces. It was removed using my method in ten minutes with a simple incision from the xiphoid branch to the umbilicus. However, the profuse bleeding continued. With difficulty I was able to establish that the bleeding was coming from the liver, which had been shot through on its posterior side at the point of entry of the portal vein. It was not possible to stop the profuse bleeding, and the patient died on the operating table.

Case 4. A lithographer, 34 years of age, wounded himself in the chest with a shot from a revolver aimed at his heart. The bullet was not detected. Within two hours a celiotomy had been performed. In the region of the curvature of the stomach, a small opening was established. A lot of coagulated and liquid blood was found in the *Bursa omentalis*. It was not possible to find the place from which the blood loss was occurring. It appeared that the bullet had passed through the tail of the pancreas, damaging one of the splenic vessels. Both the spleen and the tail of the pancreas were mobilized using my method and moved to the right, which required severing the *Ligamentum phrenico-lienale*. At this point, it became absolutely clear where the blood was coming from, as the wound to the tail of the pancreas was detected. It was thus established that the source of the blood loss was one of the branches of the *Arteria lienalis*. The vessel was sutured. The spleen and the tail of the pancreas were returned to their previous places, and the operation concluded with the thorough cleaning

of the abdominal cavity. On the fifth day, the patient died with symptoms of partial damage to the spinal cord. The autopsy revealed that the abdominal cavity was completely clean, and the spleen and the tail of the pancreas were in their proper places with no evidence of change.

Case 5. A soldier of the Red Army, 24 years of age, suffered a gunshot wound to the stomach, damaging the diaphragm, spleen and large intestine. An incision was made to the anterior abdominal wall midway from the xiphoid branch to the umbilicus. After the wound to the large intestine had been protected, the spleen was mobilized using my method and easily removed from the injured area. A tear roughly the size of four centimeters was detected at the middle of the anterior edge of the spleen. The tear was treated with three catgut stitches. The patient died four days later from necrosis of the large intestine. Autopsy revealed that the abdominal cavity was completely clean, and that the spleen was unchanged and located in its previous place.

From the Tashkent City Hospital and The Institute of Topographic Anatomy and Operational Surgery at Tashkent University
(Director: Professor Valentin Voyno-Yasenetsky)

The need to increase the extent of surgery for malignant tumors of the breast[5]

Lucas Bishop

Long ago I noticed during operations related to the cervical lymph nodes that the operation does not end with the removal of the glands in the *Trigonum colli laterale*. Very often I have found that these glands are directly linked to a whole network of glands located far and deep inside the *M. trapezius* in the direction of the shoulder blade.

These observations led me to the following question. What is the nature of this group of glands, unknown in anatomy, but so clearly involved in pathological processes? The necessity of removing these glands was obvious, as I often found under *M. trapezius* and the shoulder blade a system of lymphatic glands, consisting of large lumps. However, upon removing these glands together with their surrounding cellular tissue, I always experienced a feeling of serious doubt, as I understood very little about their topographic-anatomical significance. During the removal of the glands, very strong venous (less often arterial) bleeding occurred, most likely from *A.* and *V. transversa scapule*. When the bleeding had been stopped by the use of hemostatic forceps, I was afraid that I was damaging the functionality of the very important *N. suprascapularis*.

My interest in these unknown lymphatic glands and this unstudied area of topographic anatomy grew after the following observation.

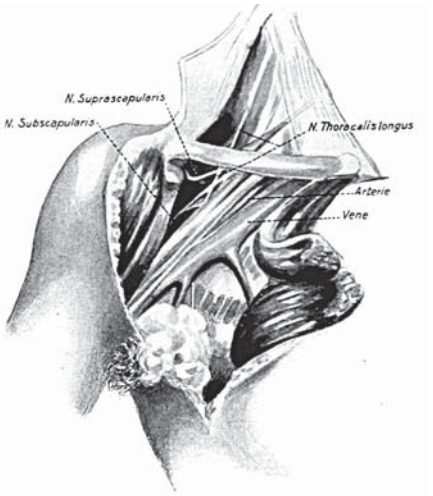
A 48 year old woman had been diagnosed with a malignant tumor in her left breast, which had begun to grow a year before. The entire gland had turned into one big tumor, which was ready to burst in many places. Large metastases were found in the immobile lymphatic glands in the shoulder cavity. Large and solid glands were also detected in the *fossa supraclavicularis*.

During the operation, which began with the removal of the *supraclavicular* glands, I found a number of carcinomatous glands under *M. trapezius* that stretched to *Incisura scapule*. This group of glands stretched downward under the collarbone and filled the triangular space between the *Clavicula*, the nerve trunks of *Plexus brachialis* and *M. coraco-brahialis* (see diagram)[6].

After the operation on these lymphatic glands (unknown in anatomy), I found metastases of a malignant tumor where earlier I had often observed processes of tuberculosis.

[5] Lucas Bischof. Notwendige Erweiterung der Operation von Mammakarzinom. Deutsche Zeitschrift fur Chirurgie. Leipzig, 1923. Bd. 183. Dezember. S. 400–405.

[6] Diagram of V. F. Voyno-Yasenetsky (note Mikhail Kozovenko).



Soon after this I had the opportunity of seeing a thirty year-old woman, on whom I had operated to treat a malignant breast tumor a year and ten months earlier. She had lost a significant amount of weight, and I could detect under *M. trapez*ius and in the *fossa supraclavicularis* a thickening of the small lymphatic gland.

I also had the opportunity to amputate a 53 year – old woman's *interscapulo-thoracica* due to the recurrence of a malignant tumor in the shoulder cavity, occurring four years after the removal of the breast. And here I found metastases in the lymphatic glands, located near *N. suprascapularis* and *Vasa transversa scapule*.

It is thus clear that the unknown lymphatic glands under M. trapezius can form a site for metastasis of malignant breast tumors. Therefore, it is necessary to remove these glands for the same reason it is necessary to remove the well known glands of the shoulder cavity in the *supraclavicular* region.

Where are these glands located and what is their topographic positioning?

First and foremost, it should be stated that they are virtually impossible to locate through conventional anatomic dissection. They are very small glands in the fatty cellular tissue that accompanies *M. omohyoideus*, *Vasa transversa scapulae* and *N. suprascapularis* on their way to *Incisura scapule*.

Subcutaneous fatty tissue with the organs mentioned above fill the anatomical medial space. This space is bordered on the side of the shoulder blade (with its covering *M. Subscapularis*) and M. trapezius. On the medial side, it is bordered by *M. serratus anterior major*, which covers the ribcage. Almost all of the medial space is located at the top of the collarbone and under it as well. Only the top part of the medial space is located in close approximation with *Regio colli lateralis* and *fossa supraclavicularis*. *Fascia coraco-clavi-pectoralis* with *M. pectoralis minor* and *M. pectoralis major* penetrating between its leaves cover the entrance to this intermediate space from the front.

If the large and small pectoral muscles, *M. subclavicus* and *Fascia coraco-clavi-pectoralis*, are removed as shown in the diagram, then entrance to the medial space described above will take the form of a triangle, which is bordered from above by the collar bone, from the medial side by the nerve trunks of *Plexus brachialis*, and from the outer side by the *Processus coracoideus* of the shoulder blade and *coraco-brachialis*.

Because of its positioning this triangle looks more or less like a Moorish well. There is only fatty cellular tissue inside, through which very important motor nerves pass at individually various depths. *N. suprascapularis* passes highest of all in a roughly lateral direction. Damage to this nerve leads to the certain paralysis of *M. supra-* and *infraspinatus*, as it supplies them with efferent nerve branches. Sometimes this nerve is located so high that it is necessary to look behind the collarbone; however, in most cases, it is found underneath. Underneath this nerve, more or less running parallel, is *N. Subscapularis*, which innervates *M. Subscapularis*. The proximal parts of both nerves cross with a third efferent nerve, *N. thoracalis longus*, which runs top down vertically through the top surface of the muscle *M. serratus anterior major* for which it is designed. This last nerve is sometimes located in a more medial position behind the large trunks of *Plexus brachialis*, but higher, at the level of the collarbone, and, in the *fossa supraclavicularis*, it always passes freely on to the surface of *M. scalenus posterior* and on the upper tooth of *M. serratus anterior major*. It is here that there is always a danger of damaging the nerve.

Two important examples of the blood vessels of the region described are the *Arteria* and *Vena transversa scapule*. Both of these vessels cross, as a rule, at the top of the collarbone. Behind the collarbone, on its way away from the artery, a number of branches extend out to the fatty tissue and neighboring muscles. This environment can cause small technical difficulties with the operation, as during the preparation of the three efferent branches and the removal of the fatty tissue

from the lymph nodes, these arterial branches are almost always injured, and the work of the surgeon can be complicated due to the resulting blood loss. It is also difficult to avoid damaging of *V. transversa scapulae*. The posterior surface of *M. omohyoideus* passes near the *Vasa transversa scapulae*.

The anatomical medial space that I have described contains lymphatic glands, nerves and vessels, which are important in their relationship to surgery, and have major significance in regard to the spreading of large abscesses in the shoulder region. In this space septic accumulations may occur, which, if not detected for a length of time, may become extremely dangerous. These accumulations can be drained only through the shoulder region or the *Foramen trilaterum*.

Thus, the described intermediate region deserves a specific name, such as *Spatium toraco-scapulare*. Furthermore, the lymphatic glands found in this region and described for the first time in this article could be called *Lymphoglandulae toraco-scapulares*. The loose fatty tissue of the *Saptium-toraco-scapulare* region crosses upward into the fatty tissue of the *Regio colli lateralis*, under the collarbone, though it is connected with the fatty tissue of the shoulder cavity.

As mentioned above, the lymphatic glands that are hidden in this region are difficult to find through anatomic dissection due to their small size. However, they can be detected with the help of a magnifying glass or microscope and slides prepared through the use of a section cutter. The best proof of their existence is macroscopic detection in the form of thick knots, nodules or bundles containing tuberculosis or malignant growths.

And thus, the Halsted operation should not be considered radical enough to treat malignant breast tumors, as in this situation the cellular tissue of the *Spatium toraco-scapulare* region is not removed.

I perform the operation in the following way. The incision begins from the middle of the posterior side of the *M. sternocleido-mastoideus* region and continues downward and outward across the collarbone and the Moorish well to the lower side of the *M. pectoralis major*. The *Fascia colli media* will be intersected and all the cellular tissue of the *fossa supraclavicularis* with the lymphatic glands will be removed. The entire front wall of the shoulder region (*M. pectoralis major* and *minor*, *Fascia coracoclavi-pectoralis*) will be intersected and the *Arteria thraco-acromialis* will be sutured. After this I begin to remove the cellular tissue of the *Spatium toraco-scapulare*. It is absolutely unnecessary and even harmful at this juncture to cut through the collarbone, as there is already more than enough room for an approach. However, it is useful, and in some instances even necessary, to remove the lateral half of the *M. subclavicus*. After working at a superficial depth on the fatty tissue from the direction of the triangular entrance to the *Spatium toraco-scapulare* under the collarbone, I insert a finger into the entrance to manipulate the fatty tissue upward from behind the collarbone, and continue the operation from above from the direction of the neck. Here it is first and foremost necessary to find the posterior surface of *M. omohyoideus*, as the *Vasa transversa scapulae* crosses it in the immediate neighboring region, and the *N. suprascapularis* is located directly below. When this most essential nerve has been found, then two others (*N. subscapularis* and *N. thoracalis longus*) are much easier to find, as they cross at the same depth. Using a figure to manipulate the cellular tissue in an up-and-down motion away from the collarbone will greatly facilitate preparation, gradual mobilization, and the eventual removal of the material. At this point, there will be a deep hole (approximately 5 cm) in the *Spatium toraco-scapulare* region with three nerves crossing below. From this point forward, the operation will continue as usual. The vessels and nerves of the shoulder cavity will be prepared, and all of its fatty tissue with the lymphatic glands will be removed. This task will be much easier and safer, if it is performed top to bottom, from the top ledge of the shoulder cavity to its base, as opposed to the usual method, which is performed from bottom to top. The operation concludes with the removal of both the large and small chest muscles, as well as the chest glands and necessary areas of skin.

I typically use the Morestin method of major skin mobilization to deal with large defects. Although this is a major operation, it takes me no longer than one and a half hours to perform it.

It is hoped that this operation, performed by an experienced surgeon, will help unfortunate patients recover from their malady. I hope that it will not be the last word on the surgical treatment of malignant breast tumors, as the removal of *Lymphoglandulae mammariae internae*, in which I have also observed the metastases of a malignant tumor, also warrants study.