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NEW TRENDS IN USSR MEDICINE: INFORMATION FROM THE BOOK  
"PROBLEMS OF CLINICAL AND EXPERIMENTAL SURGERY"

Prof A. A. Vishnevskiy, Editor

The following are summaries of papers presented at a 3-day scientific meeting held in November 1949 at the Institute of Surgery imeni A. V. Vishnevskiy, Academy of Medical Sciences USSR, to honor the memory of A. V. Vishnevskiy. The complete papers published in the book cited above, as well as some abstracts written by the Soviet authors and appended to some of the papers, were used in preparing the summaries.

"The Role of Professor A. V. Vishnevskiy in National Surgery," Professor V. S. Levit, *Med Sci Worker*, pp 5-13

A. V. Vishnevskiy, who died in November 1948, developed a method of anesthesia by creeping infiltration, involving contact of nerves along their whole length with an anesthetic which has been introduced under pressure. His work on the novocain block convinced him that this method brings about changes in the immunobiological reactions of tissues. He also devised methods of local anesthesia which greatly simplify surgery of the chest and developed a number of other surgical and therapeutic methods.

"Transplantation of the Heart," Prof B. V. Ognev, *Corr Mem, Acad Med Sci USSR*, pp 14-17

Hearts of frogs were successfully transplanted at Professor Sinitzin's laboratory in Gor'kiy: frogs with transplanted hearts survived in a state of anabiosis for several months or longer. Survival of warm-blooded animals after

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this operation has not been reported, however. From the technical viewpoint, any organ can be transplanted, but the problem of compatibility of proteins, epithelium, and endothelium of organs of the donor and the recipient has not yet been satisfactorily solved. Since 1942, extensive traumatic injuries of extremities have been successfully treated in the USSR, with the aim of preventing gangrene and saving the member in question, by carrying out a localized blood transfusion into the arterial system of the extremity. Grafting of legs to young rats was successfully demonstrated at the Surgical Society before World War II, but on healing, the rats were unable to bend the toes of the otherwise useable transplanted legs. Application of Gudov's suturing apparatus and other perfected techniques promise a greater degree of success in transplantations of the heart and other organs.

"Experimental Transplantation of the Heart and Lunge," V. P. Denikhov, pp 18-32

Attempts at homoplastic transplantation of organs have been unsuccessful until now, owing to imperfect surgical techniques and failure to restore blood circulation in the transplant. Incompatibility has no bearing at all on the failures. The following operations were successfully performed, among others: grafting of chicken cornea to human subject (Filatov); transplantation of kidneys (Shuga); transplantation of ovaries to rats and guinea pigs, with restored function (Kryaskaya and Loparin, Kabak); grafting of a hind leg to a rat (Lapchinskiy); implantation of a rudimentary tooth from a dead puppy into an adult dog (Lapchinskiy); transfusion of blood of another group to dogs (Fedorov, Kasatkina); and connection of the bodies of two animals with each other, so that parabiosis is established (Kolpakov and Perel'man; prior to that operations of this type were unsuccessfully attempted by Sauerbruch).

The author of this paper and his group have worked since 1940 on the transplantation of hearts, lungs, and kidneys of warm-blooded animals. The series of experiments described at present deals with transplantation of a second heart and its parallel connection into the system of blood circulation; transplantations of a second heart, together with one lung; transplantation of a second heart with ventriculoauricular anastomosis; and complete replacement of the heart and lungs. All experiments were carried out on dogs, and the organs were implanted into the chest. One of the dogs with two hearts lived for 10 weeks; another for 6 weeks; the majority of dogs with two hearts lived for 5-10 days. After complete replacement of the heart and lungs, the dogs lived for 16 hr. In the last two experiments, Gudov's suturing apparatus was used, with promising results.

"Problem of the Transplantation of Kidneys," Prof G. A. Rikhter, pp 32-37

With the aid of Gudov's suturing apparatus, the author of this paper (together with N. P. Petrova) successfully transplanted kidneys into dogs' necks, connecting them with the exterior jugular vein. The transplanted kidney functioned normally in each case, despite the presence of the second kidney. At the time when the report was presented, one of the dogs operated on in this manner had lived for 5 months and the other for 3 1/2 months. Exploratory operations on dead human bodies are being carried out with the view of transplanting kidneys into live human patients.

Discussion, pp 37-43

A. P. Lapchinskiy: After transplantation of legs, the rats operated on in this manner lived until completion of their natural span of life (i.e., longer than 2 years.) In experiments carried out with Dr Leisberg, rabbits were immunized with human tissues. On immunization with some definite human

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tissue, a rabbit yielded an agglutination reaction which was qualitatively the same in all cases but differed quantitatively (in regard to the strength of titer) with different human subjects. This indicates that human beings are not alike with regard to tissue properties and immunological properties but exhibit tissue specificity. In other words, there are tissue groups just as there are blood groups: this circumstance must be taken into consideration in carrying out homoplantic transplantation of organs.

Professor B. V. Ognev: V. P. Demikhov should pay more attention to pathologo-anatomical investigation of heart tissue at various times after transplantation of the heart. He assumes that there is regeneration of nerves and restoration of nerve connection of the heart, but evidence obtained in autopsies of his dogs gives no reason for believing this. Operational technique is not all that matters: sensibilization or desensibilization of proteins is of importance, too.

V. P. Demikhov: The existence of tissue specificity is undeniable, but there is no indication that it has any effect on organ transplantation. Bori (1894-97) united embryos of frogs with those of toads and obtained animals which were half frog, half toad, despite tissue specificity. In our laboratory, both kidneys of a dog were replaced with kidneys taken from another dog. The new kidneys functioned normally. The animal died within 3 weeks, but death was not due to any biological cause. As a result of displacement of the kidneys, folding over of the veins took place, and there was venous stagnation in the kidneys. This condition led to death.

P. F. Zdrovokiy, Active Member, Academy of Medical Science USSR: As far as incompatibility of proteins is concerned, one must not forget that blood, after being withdrawn from the body with a syringe, or a kidney, after it has been exposed to the air and cooled, become antigenically heterogenous with respect to the organism from which they originate. This is due to denaturation of proteins and other changes.

P. N. Mazayev: Demikhov should be reminded of the processes of resorption which take place after transplantations. I pointed out repeatedly that the use of collodion tubes for connecting blood vessels in Demikhov's experiments interferes with nutrition vasa vasorum at the site of the suture. Use of Gudov's suturing device will improve matters in this respect.

Professor A. A. Vishnevskiy: In reviewing the preceding discussion, one may mention that B. V. Ognev was the first in the USSR to transplant the heart of a warm-blooded animal. He did this by connecting the heart to the femoral artery and the femoral vein. V. P. Demikhov was the first investigator in the world to transplant the heart of a warm-blooded animal into the chest cavity. Mazayev and Chepov achieved results that are worthy of attention by transplanting the legs of dogs. These results are excellent: the dogs are perfectly normal and healthy after the operation.

#### DRUG-INDUCED PROTECTIVE INHIBITION ACCORDING TO I. P. PAVLOV

"Sleep Therapy in the Surgical Clinic," A. S. Kharnas, pp 44-51

In developing the method of sleep therapy at the surgical clinic, we abandoned narcotic sleep as applied in psychiatric treatments, because the toxic effect is too great; we also rejected Professor Asratyan's complex sleep-producing liquid because of the complicated manner of its application. We use barbamyd, sodium amital, and nembutal in minimal but sufficiently effective doses to produce 20 hr of sleep during 24 hr for continuous periods

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of 4-5 hr. For the treatment of acute inflammatory processes, burns, and contusions and bruises of the brain, 2-5 days of sleep are used; for chronic inflammatory processes (trophic ulcers of extremities), 12-15 days; and for ulcers of the stomach and the duodenum, 15-20 days.

The results were good in all of the conditions mentioned and resembled those achieved by applying A. V. Vishnevskiy's novocain block. The majority of patients treated for ulcers of the legs had had these ulcers for 2-20 years. Until now, treatment of acute inflammatory conditions with therapeutic sleep was regarded as contraindicated. Therapeutic sleep was also found beneficial in promoting healing and preventing shock after major surgical operations of the stomach, lungs, or esophagus. While the brain cortex is inhibited during therapeutic sleep, the activity of the subcortical region, particularly its hypothalamic part, which contains higher vegetative centers, is released. These higher vegetative centers, which have tropic functions, are presumably stimulated by the small quantities of hypnotics administered by us.

"Effect of Protective Inhibition on the Processes of Infection and Immunity," I. Ya. Uchitel', pp 51-60

During uninterrupted sleep continuing for 3 days, the development of antitoxic immunity against tetanus is slowed down in experimental animals. After termination of the sleep, the intensity of the production of antitoxin is fully restored. Prolonged, uninterrupted sleep inhibits the course of allergic processes. Drug-produced sleep inhibits, but does not eliminate, the vascular reaction brought about by the introduction of scarlet fever toxin. Prolonged, drug-produced sleep, in the majority of cases, prevents the development of necrotic tissue afflictions which are induced by specific irritants (diphtheria or staphylococcus toxin; culture of staphylococci), as well as nonspecific irritants (turpentine).

"Effects of Novocain Block and Drug-Induced Sleep on the Permeability of Capillaries in Inflammation," K. F. Dogayeva, S. I. Itkin, pp 50-66

Experiments carried out by measuring diffusion of Trypan blue out of the capillaries of a rabbit's ear show that the reduced permeability of capillaries in inflammatory processes is restored in an equal measure by a novocain block or nembutal-produced therapeutic sleep. A novocain block acts on the sympathetic nervous system: when the upper cervical sympathetic ganglion has been removed, application of novocain has no effect whatever in restoring the permeability of capillaries. The situation is different with respect to therapeutic sleep: removal of the upper cervical sympathetic ganglion does not necessarily prevent its effect in restoring permeability of capillaries, because additional factors affecting the central nervous system are involved in its action. The significance of the central nervous system in the formation of edemas was shown by A. A. Vishnevskiy and Astapov, whose experiments demonstrated that lewisite does not produce edemas in decerebrated animals.

Discussion, pp 66-69

Professor A. N. Ryzhikh: A post-transfusion or colloidoclastic shock never occurs when the subject is in a state of sleep or narcosis. The colloidoclastic theory of Professor Bogomolets is not correct, because protein incompatibility and formation of toxic products are not the only factors which matter. Pathogenesis of the post-transfusion shock is connected with an excessive irritation of the nervous system: in a state of sleep, such an

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irritation of the cortex and subcortical centers does not take place. One should carry out transfusions of blood of some other species of animal to experimental animals and compare their reactions in a state of sleep and a state of wakefulness.

M. I. Polginn: Since August 1949, treatment of burns with therapeutic sleep, according to a proposal made by A. A. Vishnevskiy, has been carried out. The effect of the central nervous system on clinical manifestations of burns is proven by the possibility of production a reaction to burns with the aid of hypnosis. Zhrebina and Meystrakh demonstrated that on infliction of a burn under narcosis, a leukocytary reaction does not take place, while local reactions are weakly expressed. Galkin, on inflicting burns to cats which were under ether-chloroform narcosis, also did not obtain any leukocytary reaction. These facts prove that the brain cortex exerts an effect on the development and course of reactions due to this cause.

Professor Asratyan published data on the effect of antishock liquid in burns: he was able to prolong the life of experimental animals by this method. He also used antishock liquid successfully in clinical cases. Professor Dykhno reported successful treatment of shock due to burns with a modified Asratyan antishock liquid. Professor Topchibashev proposed ether-oil narcosis as a means of bringing out of the shock condition patients suffering from burns. In the treatment of aftereffects of burns, some clinical workers use narcotics alone or in combination with a magnesium-sulfate solution, to bring patients out of the state of shock. At the Institute of Surgery imeni A. V. Vishnevskiy, we had used successfully for this purpose intermittent therapeutic sleep produced by barbamyil and having a duration of 3-5 days. Application of therapeutic sleep in combination with A. V. Vishnevskiy's closed method of treating burns will improve results obtained after evacuation of burned patients under war conditions.

Professor A. A. Vishnevskiy: In regard to I. Ya. Uchitel's report, one may point out that sleep and narcosis are not the same thing. Narcosis always interferes with the activity of cells and reduces the resistance of the organism, while sleep strengthens the organism and improves the functioning of nerve cells. The difference between sleep and narcosis is clearly seen in immunological reactions: narcosis suppresses immunobiological reactions, while sleep reinforces them. As far as allergic reactions are concerned, the effects of sleep and narcosis are similar: both suppress allergic reactions. Therapeutic sleep will prove to be of importance to military medicine. In the treatment of wounded, it will prevent secondary shock and delay infection, more effectively so if supplemented by treatment with penicillin. In other words, artificial stabilization of the condition of wounded for definite periods of time will be achieved.

#### ETIOLOGY, PATHOGENESIS, AND THERAPY OF INFLAMMATORY PROCESSES

"Penicillin and Its Effect on the Course of Inflammation Processes," Prof V. Ya. Shlapoberskiy, pp 70-75

In addition to its effects on bacteria, penicillin exerts a definite action on the macroorganism. Application of this antibiotic in inflammation processes, particularly those which are caused by a penicillin-sensitive microflora, brings about a change in the course of the pathological process which is characterized by its localization, strengthening of the healing process, reduction of the collateral edema, diminution of the toxic reaction, etc. One must bear in mind that when penicillin is used, a change in the character of the pathological process may be brought about which will tend to disguise the

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existence of a condition requiring immediate surgical interference. When the diagnosis is doubtful, particularly in cases where acute pyoscleritis or a suppurative condition of inner organs is suspected, one should withhold penicillin therapy until an exact diagnosis has been made. Penicillin must be administered under careful observation of the course of the disease by the physician.

"Novocain-Penicillin Block in the Therapy of Acute Inflammation Processes," Ye. G. Burmenko, pp 75-82

Novocain not only does not lower the bacteriostatic effect of penicillin but, on the contrary, strengthens it when both are applied. A 0.25% solution of novocain prolongs the period during which penicillin remains in the blood. Disappearance of penicillin from peripheral blood occurs 1 1/2-2 hr earlier than from blood at the site where novocain-penicillin have been injected. When novocain is administered together with penicillin, a smaller dose of penicillin is required. Treatment of carbuncles with penicillin-novocain is superior to all other methods of therapy. Combination of penicillin with novocain represents a unification of pathogenetic and etiological therapy. As such, it is an effective method for the treatment of acute suppurative inflammatory processes, which should find wide practical application.

"Treatment of Suppurative Tendovaginites A. V. Vishnevskiy's Method," Prof A. N. Ryzhikh, M. Ye. Zukerman, pp 82-86

Good results were obtained by avoiding surgical interference in tendovaginites, but instead injecting penicillin into the sheath of the tendon or, in cases accompanied by strong suppuration, a septically toxic conditions, and progressive lymphangitis, by establishing a novocain-penicillin block.

"Treatment of Tuberculous Genitals by A. V. Vishnevskiy's Method," M. N. Arshilova, N. I. Krakovskiy, pp 86-91

Surgical excision of the infected parts of bone, filling of the cavity formed in this manner with an antiseptically acting oil, and application of a gypsum bandage were found to be of advantage in treating tuberculous genitals of the knee. In this method of treatment, the oil promotes drainage.

"Burns and Their Treatment by A. V. Vishnevskiy's Method," G. D. Vilyavin, A. Ye. Khrushcheva, O. V. Shumova, O. A. Yuchenkova, pp 91-99

According to A. V. Vishnevskiy, treatment of burns is carried out in the following manner: first, shock is combated by novocain blocks, keeping the patient warm, administration of cardiac stimulants and morphine, and transfusion of blood or plasma. The skin surrounding the burn is washed with alcohol or ether, large blisters are cut, and the surface of the burn is rinsed with a physiological salt solution. Then, one layer of gauze moistened in a penicillin solution and two layers of gauze coated with Vishnevskiy's oil-balsam salve are applied to the burn. If there is no shock, the patient is given a bath in a dilute potassium permanganate solution. He is placed in a tent, the inside of which is kept warm by means of electric lights. To combat toxic conditions, one applies subcutaneous and rectal administration of a physiological salt solution and of glucose, blood transfusions, and cardiac stimulants. An appropriate diet and vitamins are prescribed. In third-degree burns, transplantation of skin flaps is carried out. This method of treatment was found to be successful: it promotes healing, prevents shock, and eliminates pain. The novocain block, by acting on the nervous system and the

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vascular tone... prevents or reduces the development of edema and plasmorrhhea. In consequence of this, thickening of the blood is reduced, and other biochemical changes are prevented. In third-degree burns, detachment and removal of necrotized tissues is expedited.

"Morphological Changes of Granulations in the treatment of Burns by A. V. Vishnevskiy's Method," M. I. Razumov, M. G. Khanin, pp 99-111.

The treatment of burns according to Vishnevskiy, with oil-balsam bandages completely covering the injury and being changed every 7-8 days, preserves in a natural state of protein substrate on the surface of the wound, thus creating suitable conditions for growth of granulation tissue from the blood vessels being restored in the wound and, subsequently, for restoration of the skin. In the damaged tissues, after the necrotized sections have been eliminated, damaged blood vessels, lumps of connective tissue, and fatty cellular tissue in a state of necrobiosis are found to remain.

Necrobiotic tissues are incapable of normal regeneration. Epithelization of the surface of the burn depends on the development during granulation of elements of the fibroblastic type and their ripening, which results in the paraplasmic proliferation of collagen. Prolonged delay in epithelization is due to a deviation in the regeneration of a mesenchymal element toward formation of plasmatic elements and myeloid tissue. Stoppage of the development of mesenchymal elements at the stage of formation of argyrophilic fibers does not create conditions favorable to fixation of cutaneous epithelium on granulations. Cutaneous epithelium as such has an exceptional capacity for proliferation and for movement from the edges of the wound onto the granulating surface, as well as for formation, by seeding of sections removed from the edges of the wound, provided that in the course of granulation, regeneration of the connective stroma, i.e., collagen fibers, has taken place. Histological investigation of the state of granulation during the period of treatment, according to A. V. Vishnevskiy, demonstrates that there is a possibility of influencing the processes of differentiation of mesenchymal elements in such a manner that initiation of the necessary fibroblastic proliferation is stimulated.

"Functional Changes of Nerves in the Zone of the Focus of Inflammation," L. N. Vlasova, Cand Med Sci; Dr S. P. Protopopov, pp 111-119

The inflammation process develops against a background of sharp changes in the functioning of peripheral elements of the vegetative and somatic nervous system. These changes are characterized by the presence of a zone of suppression of nerve elements at the focus of inflammation and a zone of irritation around this focus. Functional disturbances of the nervous system often pass beyond the region of the inflammation infiltrate and hyperemia. They are often accompanied by repercussion phenomena in the symmetric region. When the inflammation has passed, a trace reaction often remains as a result of the functional shifts in the nervous system. This trace reaction has a stable character in chronic inflammation processes. The changes indicated may be the basis for the pathogenesis of slowly healing wounds and the recurrence of ulcers. Our data gives reasons for the belief that functional transitions in the nervous system, in case of inflammation, are of a parabiotoxic type, with characteristic alteration of phases.

A novocain block, being a weak irritant of the nervous system, tunes up and normalizes the nervous system's functional condition at the focus of inflammation. It weakens the degree of irritation and in this manner contributes to bringing sharply depressed nerve elements out of the parabiotoxic state.

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Rational therapy of trophic disturbances of the nervous system in inflammation should be based on equalization of functions of nerve elements, not elimination of the effects of inflammation of surgery (neurotomy or sympathectomy).

Discussion, pp 119-121.

Docent V. M. Osipovskiy: Intra-arterial injections of sulfanilamides were fairly extensively applied in the treatment of wounded during World War II (Martyrov, Sha'nbazyun, Osipovskiy, Lavrov's Clinic), as well as in peacetime (Konstantinova, Ivanenko, and others). In postwar years, we accumulated at the Kazan' Clinic of First Aid Surgery a considerable amount of data on the treatment of suppurative-inflammatory complications of brain injuries and of traumas of extremities with intra-arterial injections of brain injuries and of drawback of intravenous administration is the fact that the drug is considerably diluted before it reaches the site of the injury through the artery and capillaries. This dilution is avoided by intra-arterial injection. The safety of carrying out arterial punctations has been demonstrated experimentally and histologically by Ivanov and Kovanov, Vlasov and Deyanov, Borshteyn-Boyerskiy, etc. In three cases of acute peritonitis, as a last resort, we inject penicillin into the left ventricle of the heart, according to Kovanov. The technique of this application is simple, but the method cannot be generally used. In peritonitis, before surgery, it has been proved effective to inject penicillin into the abdominal aorta, above the site of injury.

Ye. P. Stepanyan: At the laboratory of the Institute of Surgery imeni A. V. Vishnevskiy, we found that penicillin exerts an antitoxic effect. By very clear experiments carried out in vitro and in vivo on mice and rabbits, we proved by the striction method that a chemical reaction between the toxic and penicillin takes place in the presence of a catalyst found by us. As a result of the chemical reaction, a neutral substance is formed which, on administration to mice or rabbits, preserves their lives. It is gratifying that Professor I. G. Rufanov and Professor V. Ya. Shlapoberskiy confirmed the antitoxic action of penicillin. We established that even a lethal dose of staphylococcus toxin requires only a minimal quantity of penicillin for detoxification in the presence of our catalyst.

S. P. Protopopov. In regard to the paper presented by L. N. Vlasova, I should like to remark in connection with our investigations that in cases of inflammations, disturbances of the function of nerve elements occur in the whole organism rather than at the focus of inflammation only. This confirms A. V. Vishnevskiy's viewpoint, who regarded inflammation as a dystrophy. Protection of the nervous system, substitution of a strong with a weak irritation, and restoration of normal functions of the nervous system are in accordance with this viewpoint. Vishnevskiy's methods of treatment have the purpose of protecting the nervous system and restoring its normal functions. Crude surgical interferences are incompatible with this attitude.

G. D. Vliyavin: As has been already emphasized by Professor Yu. Yu. Dzhanelidze, treatment of burns also presents a complicated problem from the organizational viewpoint. Treatment of victims of burns, on occasions when a great number of people are affected, should be carried out at specially organized departments of medical institutions or special hospitals. In this respect, a special department organized at the Institute of First Aid Surgery at Leningrad must be regarded as an ideal solution of the problem. We [Institute of Surgery imeni A. V. Vishnevskiy?] are also moving in this direction, having organized a ward for the treatment of burns, consisting of 20 beds, but many Moscow medical institutions treat burn victims without segregating them in special wards. More attention should be paid to the organization of specialized, extensive departments for this purpose.

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For measuring the extent of burn, Postnikov's method is the best. However, his method does not evaluate the degree of injury: this problem has been solved by our color scheme for the precise designation of burns.

A. V. Grigor'yan: For determining the degree of toxicosis in various surgical diseases, we are using the striction method proposed by Professor Tarusev et al. in 1941. This method permits determination of minimal quantities of toxin (of the order of  $10^{-8}$  -  $10^{-12}$ ) in spinal liquid, blood, and other biological media. It is based on the fact that bacterial toxins destroy the protoplasm of surviving muscle tissue of various animals. The destruction of protoplasm brings about a change of the total volume of the tissue, and this change can be measured by a very precise physicochemical dilatometric method. The effect of penicillin and various other therapeutic agents on toxemia can be determined with the aid of the striction method. The finding that penicillin exerts an antitoxic action is new.

A. P. Urazova: Our clinic (which is directed by Professor I. G. Rufanov) began to use penicillin in 1943 and has always used only USSR penicillin. During World War II, Academician N. N. Burdenko proposed intra-arterial injection of penicillin. Our clinic has developed this method. The clinic is carrying out systematic work on methods for prolonging the action of penicillin. These methods include injection of penicillin together with blood and injection of penicillin dissolved in a 1% pyramidon solution.

Professor V. Ia. Shlapoberskiy: I have some doubts on the treatment of peritonitis by injecting penicillin into the abdominal aorta, as suggested by Professor Jaipovski. Under the circumstances, the effect of the antibiotic will be predominantly exerted in the legs. Puncture of the aorta, particularly when it shows atherosclerotic changes, is not safe. Introduction of penicillin into the aorta will not bring about detoxification of the peritoneum, while ordinary methods of applying penicillin do achieve this aim. Data obtained at Rufanov's clinic indicates that penicillin has no effect on the coagulation of blood: our data indicates the contrary, as far as patients having a high degree of toxicity are concerned. I am of the opinion that while penicillin does not influence a normal macroorganism, it has a distinct effect on it when this organism is pathologically changed. Our histological data bear this out.

The fact that novocain reinforces the action of penicillin seems to be well substantiated. As far as methods for establishing penicillin depots are concerned, they all suffer from the drawback that uniform resorption, i.e., a uniform concentration of the antibiotic in the blood during the time that the depot is active, cannot be achieved.

"Clinicophysiological Investigations," Acad K. M. Bykov, pp 132-137

The concept of nervism strongly appealed to A. V. Vishnevskiy. In developing and applying the method of the novocain block, Vishnevskiy not only attempted to bring about anesthesia, he regarded the novocain block as a means of influencing the course of the pathological process. A new school of medicine originated with Vishnevskiy: physicians became clinical physiologists, or rather, clinical pathophysiologicalists. At present, medicine must finally free itself of localism and emphasize the unity of the organism functioning as a whole under the control of the nervous system. Abroad, they also talk about unity, but actually mean by it psychosomatic parallelism. For constructive development of the idea of unity, a background of materialistic physiology is needed. We have this background in our biology and physiology, but they lack it abroad. Michurin's teaching started with general concepts but led to the possibility of directing biological processes into predetermined channels. It is true that because of differences in speed, this can be

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accomplished more easily in the case of plants or primitive animals. In human beings, the processes in question proceed at an unusually fast rate and are strengthened by impulses originating in the brain. Surgery has reached a high degree of perfection, but it should not be understood as a method only. There must be the right idea behind it. This is where physiology enters: after an organ has been modified or transplanted by the most perfect technical methods, it must function.

"On the Irritating and Blocking Transmission of Nerve Impulses Under the Influence of Novocain," N. V. Kirzon, O. R. Kol's, A. M. Tsukerman, pp 137-147

Novocain exerts an irritating effect on interoceptors. This is demonstrated by the reflex stoppage of the heart and respiratory movements of a frog after a novocain solution has been applied to various internal organs. The irritation generated in this manner passes along afferent paths of the sympathetic and parasympathetic nervous system and apparently reaches the same region of nervous centers. After application of novocain to the frog's mesentery, volleys of afferent impulses along the ventral nerve are registered. The flow of impulses continues much longer than the reflex stoppage of the heart. In the limits of the central nervous system, rapid adaptation to these impulses takes place. However, this does not mean that the afferent impulses remain ineffective as far as changes in the corresponding centers are concerned. If the central nervous system of the animal (frog) is preserved, application of novocain to a motor nerve on one side, in many cases, brings about changes in the excitability of the motor apparatus on the other side.

On the basis of the conditions of the experiment, one may assume that this phenomenon results from changes taking place in the central nervous system. According to oscillographic data on the development of the blocking action of novocain, the wave of excitation, on passing through the parabolic and nearest transparabolic regions, is transformed from a two-phase to a single-phase wave. With increasing frequency of impulses passing through the region of the action of novocain, the process of this transformation is accelerated and may be traced within the range of the same series of impulses. The appearance and development of the single-phase character must be genetically related to the development of a stable parabolic excitation, according to Vvedenskiy.

"Effect of Lumbar Blocking With Novocain on Reflexes From Interoceptors in Aseptic Inflammation, in Disturbances of Blood Circulation in the Intestine, and on Removal of Individual Links of the Sympathetic Nervous System," L. A. Baraz, R. S. Vinitskaya, V. I. Popov, Ye. K. Shur, pp 146-154

Novocain exerts not only a neurotoxic but also an irritating effect, bringing about strengthening of reflexes from interoceptors. The action of novocain is different in normal and pathological conditions, depending on the functional condition of the nervous apparatus of the organism. The novocain block exerts the strongest effect on reflexes from interoceptors in the inflamed region. When there are extensive injuries of the sympathetic nervous system, the novocain block does not produce any effect. The experimental material obtained in this instance confirms A. V. Vishnevskiy's view to the effect that the novocain block acts as a weak irritant on the nervous system.

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"The Effect of a 0.25% Solution of Novocain on the Activity of Choline Esterase and the Content of Acetylcholine in the Upper Cervical Sympathetic Ganglion," T. V. Pravidich-Neminskaya, pp 155-162

When blocking with an 0.25% solution of novocain has been applied, the activity of choline esterase in the upper cervical sympathetic ganglion increases. At the same time, the content of acetylcholine in this ganglion decreases. A novocain block of the upper cervical sympathetic ganglion, by activating choline esterase, produces weakening of the contraction of a cat's third eyelid when this contraction has been brought about by irritating the preganglion sympathetic stem with an induction current. Experiments on perfusion of the upper cervical sympathetic ganglion demonstrated that novocain lowers or removes completely the effect of acetylcholine. Novocain lowers the rate of flow of the perfusate through the capillaries of the ganglion. The results obtained in this instance may be used in partially explaining, from the chemical standpoint, the mechanism of the action of acetylcholine as a weak irritant, in addition to that as a neurotoxic agent. Novocain counteracts acetylcholine by activating choline esterase.

"The Effect of a 0.25% Solution of Novocain on Vascular Reflexes in Hemoteterotransfusion Shock," A. L. Komendantova, pp 162-168

Using cats and dogs as experimental animals, the reactions to massive doses of rabbit blood were studied by observing (1) reflex changes of the levels of blood pressure and respiration as registered on a kymograph when the barometric pressure in the region of the carotid sinus was raised or lowered; (2) reflexes from chemoreceptors (sensitivity of acetylcholine) of a section of the small intestine, which was isolated as far as vascular connections are concerned; and (3) the rate of blood coagulation.

Results obtained by studying vascular reflexes to the introduction of heterogenous blood showed that small doses of this blood, which do not produce clear changes in the blood pressure, stimulate carotid sinus reflexes in response to pressure exerted on the carotid artery; that introduction of massive doses of heterogenous blood weakens these reflexes or makes them disappear altogether; that restoration of these reflexes proceeds simultaneously with an increase in the level of blood pressure, although there is no complete parallelism; that introduction of heterogenous blood into the vessels of an isolated section of the small intestine brings about lowering of the sensitivity of chemoreceptors of this section to acetylcholine for 3-10 min; and that introduction of heterogenous blood into the general circulation produces lowering of the sensitivity of chemoreceptors of an isolated section of the small intestine to acetylcholine for 25-40 min.

These results lead to the conclusion that lowering of the sensitivity of vascular reflexes due to the introduction of heterogenous blood is due both to a direct effect on peripheral receptors and (to a still greater extent) changes in the functional condition of central nervous mechanisms. On introducing heterogenous blood into the hip and applying a vagosympathetic block with 0.25% novocain at the level of the lower cervical sympathetic ganglion, there was an insignificant increase of blood pressure when the block was applied after the blood pressure had dropped below 40 mm Hg. However, the animal still perished. With a blood pressure not lower than 60-70 mm Hg, the novocain block produces a distinct increase in the blood pressure, as well as restoration and strengthening of carotid sinus reflexes. Severing of the vagosympathetic nerve trunks at the same level and under the same conditions produces the same effects as the novocain block.

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These effects can also be brought about by cooling the vagosympathetic trunks with water having a temperature of 6-8° C and establishing the block in this manner. In the vagosympathetic block, the novocain exerts a neurotoxic effect. A lumbar novocain block applied to a healthy animal brings about an insignificant acceleration in the rate of blood coagulation and stimulation of carotid sinus reflexes during 15-25 min. A lumbar novocain block applied after heterogenous blood is introduced does not prevent death of the animal if the blood pressure has dropped below 40 mm Hg. If the blood pressure has not dropped below 60-70 mm Hg, a lumbar block raises the blood pressure and stimulates carotid sinus reflexes resulting from compression of the carotid artery. At the same time, reflexes produced by increasing pressure in the region of the carotid sinus are weakened. This weakening continues for 10-15 min, after which the reflexes are gradually restored to the initial level. Reflexes in response to acetylcholine from chemoreceptors of an isolated section of the small intestine also drop in intensity (during 15-20 min). The data on the lumbar block is somewhat difficult to evaluate, because it is impossible to eliminate the neurotoxic effect of novocain after this substance has been injected into the cellular tissue in the vicinity of the kidney. For that reason, in a subsequent series of experiments, novocain was injected into the spleen or an isolated section of the small intestine connected with the body of the experimental animal (a cat) solely by means of nerves. Under the circumstances, novocain could exert a nerve reflex action only. When this drug was introduced into the blood vessels of the organs isolated in this manner, acceleration of the rate of blood coagulation was produced for a period of 25-30 min, with a maximum 5-7 min after administration. Stimulation of carotid sinus reflexes as a result of compression of the carotid arteries was also observed.

"Pathogenesis and Treatment of Spontaneous Gangrene," V. A. Erusentsova, S. S. Zimovskaya, N. N. Kukin, Prof V. I. Pshenichnikov, pp 168-184

Spontaneous gangrene is not a local affliction: it is accompanied by general disturbances (functional changes in blood vessels, which no longer respond to vasodilatory irritations; destructive changes in the bones of the feet; atrophy of the skin; falling of hair; inflammatory and degenerative changes in the peripheral, central, and vegetative nervous system), and represents a general disease connected with an abnormal condition of the nervous and vascular systems. Spastic, atonic, and spastic-tonic conditions of blood vessels of the eye fundus are typical for spontaneous gangrene. This disease can be treated to advantage by A. V. Vishnevskiy's method, which involves a bilateral lumbar novocain block and application of bandages covered with Vishnevskiy's oil-balsam emulsion from the tips of the toes to the upper third of the thigh. These bandages are held in place by one layer of a plaster-of-Paris bandage and changed every 10-15 days.

"Alterations of Vascular Reactions, Basal Metabolism, and Skin Temperature in Patients Suffering From Obliterating Endarteritis on Treatment With A Novocain Block and Oil-Balsam Bandage," K. A. Sergeyeva, F. V. Spiridonova, pp 184-190

Patients suffering from obliterating endarteritis exhibit reversed vascular reactions to hot and cold stimuli, a low skin temperature, and pathological thermosymmetry. Alterations of vascular reactions and basal metabolism in these patients correspond to the clinically established forms of the disease, i. e., spastic, atonic, and mixed. Patients who have the spastic type of the disease and suffer from a prolonged form of it exhibit spastic vascular reactions to temperature irritations, as well as a sharp lowering of basal metabolism. Patients having the atonic form of the disease respond to temperature irritations with vasodilation or show no reaction whatsoever.

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Patients with the mixed form of the disease exhibit reactions which are typical for the individual patient, but these reactions occasionally change. The last two groups mentioned show a normal level of basal metabolism. Treatment with a novocain block and oil-balsam bandages levels out vascular reactions, restores the basal metabolism to normal, and increases the skin temperature. Restoration of normal vascular reactions and increase of the skin temperature after treatment take place faster in spastic than atonic or mixed cases, which fully confirms A. V. Vishnevskiy's views on the subject.

"Vascular Reaction in Patients Suffering From Ulcers of the Stomach or Duodenum After Treatment With a Novocain Bloc," O. L. Nentsova pp 190-196

On treatment with a lumbar bilateral novocain block, established by injecting novocain into both kidney areas and applying an oil-balsam bandage to the abdomen, the amplitude of pulsating oscillations in vascular reactions increases and vascular spasms decrease; normal vascular reactions to temperature irritations are restored; wave-shaped oscillations of vascular reactions, as recorded by a plethysmograph, are eliminated. In this investigation, a method of plethysmography perfected in K. M. Bykov's laboratory was used.

"Problem of the Antihistamine Effect of Paraaminobenzoic Acid, a Product of Novocain Hydrolysis," Ye. P. Stepanyan, A. V. Fridman, pp 196-204

Using Tarusev's striction method for the determination of toxicity, it was established that novocain exerts an antihistaminic (detoxifying) effect only in the presence of blood serum. The same applies to paraaminobenzoic acid, which is formed as a result of hydrolysis of novocain. Blood serum stimulates the hydrolysis of novocain. Either novocain or paraaminobenzoic acid removes in vitro the toxicity of the blood of patients suffering from burns. Incubation of paraaminobenzoic acid with histamine forms a complex which is more toxic to guinea pigs than histamine itself. When a histamine solution was incubated with blood serum alone, the resulting solution killed guinea pigs, but incubation of histamine, blood serum, and paraaminobenzoic acid resulted in a mixture which did not have a lethal effect. High doses of paraaminobenzoic acid increase the permeability of capillaries and thus hasten the death of guinea pigs from histamine. The antihistaminic and anti-toxic effect of paraaminobenzoic acid formed from novocain explains the advantages of A. V. Vishnevskiy's local novocain anesthesia as compared with general narcosis.

"Comparative Characterization of Antihistamine Activity of Novocain and Paraaminobenzoic Acid," D. A. Almoyeva, pp 204-208

The introduction by A. V. Vishnevskiy during World War II of the novocain block as a method of combating traumatic shock and other forms of shock stimulated investigations on the physiological action of novocain, both in the USSR and abroad. We have previously established that novocain prevents experimental shock produced by the injection of histamine into dogs. In the series of experiments carried out at present, we found that paraaminobenzoic acid exerts a similar antihistaminic effect. Paraaminobenzoic acid derived from novocain is somewhat more effective than on administration by itself in the form of a pure substance. Our data eliminates the possibility that paraaminobenzoic acid may enter into a chemical reaction with histamine: its action is undoubtedly that of a neurogenic agent exerting its effect on the peripheral and central nervous system.

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Discussion pp 208-215

Professor M. S. Dornachev: Originally, A. V. Vishnevskiy and Academician A. D. Speranskiy regarded the novocain block as a mere interruption of the transmission of pain reflexes along nerve paths. They soon found, however, that application of a sheath (futlyar) novocain block to one extremity exerts an identical therapeutic effect on the other extremity. In veterinary practice, horses suffering from intestinal obstruction frequently had to be killed. Professor A. Tikhenin, who worked at a veterinary polyclinic, decided to apply a novocain block to one of these horses. The horse was saved by this treatment, as were many others in the future. Ninety-six percent of horses suffering from this condition have intestinal obstruction of a dynamic type. Professor G. M. Novikov (Kazan') tried treatment with the novocain block on human patients suffering from dynamic intestinal obstruction and obtained good results. At present, the novocain block is used not only as a therapeutic, but also a diagnostic method in cases of intestinal obstruction: if, one hour after application of a bilateral block, the condition has not been alleviated, we conclude that mechanical rather than dynamic obstruction is present and perform a surgical operation.

S. F. Zakhar'yan: The effectiveness of the novocain block in combating shock can be illustrated by citing the case of a 78-year-old patient who was operated on for intestinal obstruction and received two transfusions of A (II) blood (one without any harmful effect), while her own blood group was O (I). After the mistake became evident, the patient was rapidly brought out of the state of hemolytic shock by a lumbar bilateral novocain block (80 ml of a 0.25% solution of novocain into each side), bloodletting, and transfusion of O (I) blood. The greater effectiveness of the novocain block in hemotransfusion shock than in traumatic shock is explained by the fact that the block is always applied later in traumatic shock.

K. M. Bykov: The results presented during the symposium on the novocain block (pp 137-214) and the progress achieved in this field represent a veritable triumph of our science.

#### CHEST SURGERY AND LOCAL ANESTHESIA

"The Significance of A. V. Vishnevskiy's Work for the Surgery of Lung Tuberculosis," Prof N. G. Stoyko, pp 216-220

A. V. Vishnevskiy's method of local anesthesia completely eliminated pneumonia and other complications following thoracoplasty. The method of oil-balsam tamponage he introduced for the treatment of tuberculous empyemas is equally important, while his work on the application of cavernotomy also represents a considerable advance in the field of chest surgery.

"Resection of the Lungs," Prof B. K. Oripov, pp 220-226

Timely diagnoses of diseases of organs of the chest cavity assures successful treatment of these diseases. Surgeons have learned how to combat shock in cases of an open pneumothorax. Local anesthesia, according to A. V. Vishnevskiy, permits painless operations and eliminates the risk of bringing about pleuropulmonary shock. Successes achieved by USSR surgeons in treating open pneumothorax cases resulting from penetrating wounds of the chest during World War II formed the basis for subsequent development of chest surgery in peacetime. Extensive and successful activity in this particular field may be expected to continue in the USSR, where no dependence on elaborate foreign surgical equipment exists. Problems of lung surgery are now becoming of interest to the average general surgeon.

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"Cervical Vagosympathetic Block in Traumas of the Chest Cavity," Prof G. M. Novikov, Ye. S. Smirnov., pp 226-229

A cervical vagosympathetic block, according to A. V. Vishnevskiy, is the most effective therapeutic method which prevents complications in closed traumas of the chest cavity, particularly in cases of rib fractures. The novocain block can be applied even under ambulatory conditions. A vagosympathetic block does not exclude application, in the case of necessity, of supplementary novocain anesthesia at the site of the fracture.

"New Method of Additional Utilization of the Small Intestine for the Construction of an Artificial Esophagus," Prof B. A. Petrov, pp 229-234

When performing plastic surgery of the esophagus under utilization of the small intestine, the surgeon is limited by the individual structure of the blood vessels of its mesentery. After three or four radial trunks have been severed, it is not always possible to bring the intestine above the collar bone: in 25% of the cases, this is unsuccessful. In cases when lifting of the intestine cannot be carried out, we recommend additional utilization of the rest of the mesentery in order to place the intestine above the collar bone without risking impairment of its blood supply. The method described is suitable for primary as well as reconstructive plastic surgery of the esophagus. Moreover, this method is of value when construction of an artificial esophagus from the small intestine is to be carried out in the chest cavity.

"Surgical Treatment of Cancer of the Cardial Part of the Stomach and the Lower Third of the Esophagus," A. M. Kudryavtseva, Ye. A. Pechatnikova, pp 234-239

The clinic of the Institute of Surgery imeni A. V. Vishnevskiy, Academy of Sciences USSR, has studied problems pertaining to the surgery of cancer of the cardia and the esophagus since 1931. Until 1942, surgery of cancer of the cardia and the esophagus was performed by the extrapleural path, according to Professor Savirykh, with A. A. Vishnevskiy's modified anastomosis, but, since 1942, the majority of operations for this condition has been carried out transpleurally. We consider that from the oncological standpoint, total removal of the stomach is preferable to resection of this organ. Gastroesophageanastomosis should be established only when the operation has been carried out in cancer of the cardia at a very early stage or cancer of the esophagus. Preparatory to the operation, the patients receive drugs which strengthen the nervous system and the heart. Therapy with penicillin is started 2-3 days before the operation, a blood transfusion is carried out, and a pneumothorax is established on the left side by introducing 200-300 cc of air. In some cases, a vagosympathetic block is applied before the operation to eliminate spasms of the esophagus, reduce inflammation of edema, etc. The operation is performed while uninterrupted blood transfusion, administration of oxygen, and obligatory transintestinal feeding, according to Spasokukotskiy, are carried out. We use a special apparatus for uninterrupted drop-stream transfusion of blood and liquids simultaneously (this apparatus was designed by Fatin, Associate of the Institute of Surgery). All operations on the esophagus are carried out under a bilateral vagosympathetic block. Statements have been published to the effect that this block should not be applied under the circumstances. We consider it superfluous to defend a method which has been thoroughly checked during several wars and, on being introduced into practice, was recognized as one of the most remarkable achievements of USSR surgery. All operations are performed under local infiltration anesthesia. In thoracoabdominal operations, anesthesia by the method of creeping infiltration is based on the following principles:

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1. Anesthesia of the skin, subcutaneous cellular tissue, and broad muscles of the chest along the line of the projected cut.
2. Injection of the anesthetizing solution by the open path (after section of the broad muscles) into the muscles between the ribs, with displacement of the infiltrate, principally toward the spine.
3. Formation of a creeping infiltrate through the parietal pleura under the deep pectoral fascia.
4. Supplementary anesthesia of the root of the lung and intrapectoral anesthesia of the diaphragmal nerve.
5. Anesthesia of the diaphragm, parietal peritoneum, and root of the mesenterium and the lesser omentum.
6. Hydraulic treatment of the esophagus with novocain, so that the danger of injuring the other pleura is reduced.

While major operations of the type described above are carried out with increasing frequency, the lethality is dropping. A transabdominal operation, according to Savinykh, is indicated only when cancer of the cardia is present in a patient of advanced age who has a diseased condition of the heart and lungs. In the near future, we will subject to physiological study the processes which take place in the organism after a thoracoabdominal operation on the stomach has been performed and displacement of the connection between the stomach and esophagus into the thorax has taken place.

"Some Problems of the Pathology and Therapy of a Ductus Botalli That Has Not Closed," M. I. Perel'man, pp 240-246

A ductus Botalli which remains open after a certain age is a dangerous condition that almost invariably leads to a lethal form of subacute septic endarteritis, with simultaneous involvement of the walls of the pulmonary artery and diffuse affliction of this artery, as well as its valve apparatus. Professor V. K. Osipov demonstrated that complications due to an open ductus Botalli can be prevented by tying off the open passage. Under the circumstances, we did some work at the Chair of Perative Surgery, First Moscow Order of Lenin Medical Institute, to establish the easiest access to the ductus Botalli and also performed some successful operations on closing it. The work that was done by Dzhamelidze, Osipov, Ognev, Bakulev, and other USSR surgeons on the open ductus Botalli is beginning to bear fruit. Soon, Soviet surgeons will also be able to tackle the surgical treatment of congenital heart diseases of the cyanotic group.

"Topography of the Ductus Botalli From the Viewpoint of Surgical Operations Performed on It," N. Ya. Galkin, pp 246-249

Autopsies on 600 corpses of children who died before the age of 14 disclosed that the ductus Botalli was open in 25.7% of the children (i. e., 154 cases). Among the 154 cases with an open ductus Botalli, 67.5% were male and 32.5% female. In 100 corpses of adults, an open ductus Botalli was not encountered in a single instance. The distribution among children, according to age groups, was as follows: up to one month, 100% of open ducts; one to 6 months, 22.7%; 6 months to one year, 10.2%; and one to 10 years, 2.5%.

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It was formerly assumed that the ductus Botalli is situated outside the pericardium [literally, the heart case]. According to our observations, this duct is located in the transition fold of the pericardium, where the leaf adjacent to the organ changes into epicardium. The fold encloses the duct along its whole length and is tightly connected with the duct's adventitia. On the basis of our investigations, we have come to the conclusion that a ductus Botalli which is still open after the age of 6 months must be regarded as pathological.

"Concerning the Question of Surgical Anatomy of the Blood Vessels of the Lung Root," V. M. Sergeev, pp 250-257

Detailed surgery carried out at the roots of the lungs has now been widely introduced. It is being applied in lobectomies and pulmonectomies. Tying up of the blood vessels in this type of surgery, an operation which formerly appeared impossible, is quite feasible if the flow of blood in the vessels of the lungs is interrupted in this manner at the level of the pericardium. From the surgical viewpoint, the anatomy of the lung roots has not been investigated sufficiently. A thorough study of the subject has been made in this instance, particularly as far as the anatomy of blood vessels is concerned.

Discussion, pp 257-266

Professor Ye. L. Berезov: In transthoracic operations of the type described by Kudryavtseva and Pechatnikova, a preliminary lumbar vagosympathetic block is not necessary. While this procedure has been definitely accepted in military field surgery and for the treatment of traumatic injuries of the chest sustained in peacetime, a well-planned and carefully prepared operation, like a resection of the esophagus or the cardia, does not require a preliminary block. Our experience shows that local anesthesia is preferable for this particular operation. Essentially, we apply an intrapleural vagosympathetic block after opening up the pleura.

Professor A. A. Vishnevskiy: In regard to the question raised by Professor Berезov, one may, under certain conditions, dispense with the vagosympathetic block in transthoracic and chest operations. This is particularly true of operations performed on the esophagus. However, a vagosympathetic block is essential when pathological changes of the organs are present, e. g., operations on the lungs in cases of bronchiectasis. Furthermore, one must not forget that a vagosympathetic block exerts a trophic effect on organs which are subjected to extensive trauma in operations of this type.

A short time ago, Professor Chernigovskiy performed the following experiment: He injected intravenously into rabbits a large quantity of adrenalin, whereupon the rabbits developed edema of the lungs. As a rule, the rabbits die from this condition. When Chernigovskiy severed or anesthetized the vagus before administering adrenalin, the animals did not develop an edema. It seems to me that the results we are getting in operations on both the lungs and the esophagus justify the use of the vagosympathetic block. We did not observe a single case of postoperational pneumonia after applying it. In World War II, all cases of chest wounds in a certain war theater were treated by applying a vagosympathetic block on the same side as the wound. In these cases, pneumonia developed predominantly on the opposite side of the block. In cases where no vagosympathetic block was applied, pneumonia developed on both sides.

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The results on the total extirpation of lungs described by Professor Osipov are outstanding. As far as the highly successful outcome of these operations is concerned, nothing like this has ever been published either in the USSR or abroad. In regard to Professor Petrov's paper, one may remark that the technique of plastic surgery of the esophagus was originally developed in Russia.

Professor V. S. Levit (concluding remarks): At present, pneumonectomies are carried out not only at Moscow and Leningrad but also at places like Pyatigorsk and in Siberia. Surgery of the lungs and of the esophagus is still in a stage of discussion and standardization of methods, a stage which has already been overcome as far as surgery of the heart is concerned.

Professor Shilovtsev (Kuybyshev) raised the question of treating an injured esophagus with a bougie to prevent strictures. Naturally, we should attempt to prevent strictures by introducing a bougie on the second or third day, and the well-organized first-aid services at Moscow, Leningrad, Kiev, and Kharkov as well as all oblast centers, are certainly capable of rendering fast and efficient aid in cases of burns of the esophagus. Whenever conservative treatment does not lead to success, surgery must be applied, however. As far as the vagosympathetic block is concerned, little remains to be added to Professor A. A. Vishnevskiy's remarks on the subject.

During my service as surgeon in World War II, I have seen with my own eyes the tremendous advantages of this method. Thanks to the vagosympathetic block, cases of chest wounds could be transported to the rear without danger of pleuropulmonary shock and open pneumothoraces treated there. I have some experience in cardiac operations and am of the opinion that it is impossible to decide whether the abdominal or thoracoabdominal path is preferable unless the peritoneum has actually been opened.

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