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THE SYSTEMATIZATION OF SOVIET MEDICAL SCIENCES

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Russian medical science has always occupied a prominent place in the history of world science. The names of N. I. Pirogov, S. P. Botkin, I. S. Sechenov, I. I. Mechnikov, and I. P. Pavlov have become famous. Mechnikov, one of the founders of modern microbiology, and Pavlov, who became famous in the beginning of the 20th Century for his research on the physiology of digestion, were honored with the Nobel prize.

Pharmacologist N. P. Kravkov, surgeons S. P. Fedorov and V. I. Razumovskiy, bacteriologist G. N. Gabrichevskiy and the present honorary academician N. F. Gamaleya have enjoyed wide fame and renown both in Russia and abroad.

Soviet science, according to the words of the President of the Academy of Sciences of the USSR, S. I. Vavilov, is "not simply a part of world science which has developed in the territory of the USSR, but a science essentially of a special structure and character." Soviet science from the first days after the Great October Socialist Revolution was placed at the disposal of the workers and subordinated to the interests of the socialist structure.

More than 300 scientific research institutes, 80 medical institutes, the Academy of Medical Sciences of the USSR and its institutes---these are the base for scientific research in medical science which has been created during 30 years of Soviet rule and is continuously developing.

The achievements of Soviet medical science founded on such a powerful base have been considerable, especially during recent years.

Work in the medical-biological sciences has been greatly accelerated. The research of I. P. Pavlov on the study of the physiology of higher nervous activity has been further developed. This study was closely connected with the bases of general and evolutionary physiology and the study of the functions of the nervous system in the process of ontogenetic (embryonic) development.

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New facts were collected on the dynamics of the nervous processes in the base of the brain under different pathological conditions, which gave a basis for methods of treating psychic diseases. L. I. Bykov established in his work an exact presentation of the interactive connections between the base of the large hemispheres of the brain and the internal organs.

The works of M. A. Baron led to the discovery of a new method of microscopic research, which he has called tracheoscopy, by the use of which many new discoveries have been made in the structure of the serous cerebral membrane and other membranes.

In the work of I. V. Davydovskiy, from data collected during the war, light was thrown on problems of the pathological anatomy of an injured duct and the significance of infection in the traumatic process, which is a great contribution to our theoretical and practical medicine.

The data obtained by I. P. Razenkov on "A New Aspect of the Activity of the Gastrointestinal Tract" are important to physiology.

The work of P. K. Anochin on the problem of the "Physiological Mechanisms of Higher Nervous Activity" demonstrated that conditioned reflex is the result of the integration of all sections of the cortices of the large cerebral hemispheres, and that curious and impellent components of reflexes are inhibited by these mechanisms. Kaplansky obtained data of great importance for the clinic with reference to the disturbance of some ferment systems in the liver and kidneys of animals on a diet with a small albumin content. Great work on the problem of the "Study of the Role of the Nervous System in the Organization of a Pathological Process" was accomplished by the A. D. Speransky School.

The pathogenesis and structure of granular tissue in humans was carefully examined and determined by N. N. Anichkov.

Attention should also be called to the work of N. I. Grashchenkov for his exposition of the mechanism of capillary processes taking place in pathological conditions of the nervous system, which made possible accurate evaluation of the effects of medication on various diseases of the nervous system. Although theoretical, Grashchenkov's work has great practical significance since it gives practicing physicians a method which permits a correct estimate of the action of various medicinal preparations (proserine, prostigmine, and eserine).

The work of our scientists in the last 2 years has been important also in the field of clinical medicine. G. N. Speranskiy gave a new classification for septic-toxic syndrome among children, and Arshavskiy gave the physiological bases for the control of primary and secondary asphyxiation in newborn infants. A. I. Dobrokhotova developed experimental whooping cough in animals and established the efficacy of using hyperimmune serum for whooping cough.

Petrov and Kholfin obtained good results in treating cancer of the rectum. Rezanskiy and Stafacu worked out new methods for the surgical treatment of cancer of the esophagus, Dillon in X-ray treatment, and Klyueva and Roskin in bacteriotherapy of cancer.

The successes of the N. N. Burdenko School in neurosurgery are a matter of general knowledge.

S. S. Girgolov and I. G. Rufanov prepared a study on wounds. The principles of diphase therapy of wounds were established. The Soviet surgeons, M. I. Chaklin, V. V. Gorinevskaya, S. S. Yudin, B. A. Petrov, N. N. Priorov, and others did a great deal to improve methods of treating fractures of the limbs. The work of M. Topchibashev provided the basis for a new method of general narcosis during an operation by introducing ether subcutaneously.

The brilliant technique of S. S. Yudin and A. G. Savinykh in operating on the esophagus and stomach was further developed at the Experimental Surgical Institue of the USSR Academy of Medical Sciences. B. V. Petrovskiy and V. I. Kazanskiy worked out an original method of anterolateral approach to the esophagus and cardia in operations for cancer of the esophagus or the cardia of the stomach.

The work of V. P. Filatov on the transplantation of cornea obtained from the dead and on tissue therapy is very well known.

Our success in the field of prophylactics and the treatment of diseases of the internal organs has also been notable. Here recognition should be given the work of M. S. Vovsi for the study of the course of gastric ulcers, gastritis, pulmonary emphysema of the lungs, pneumonia, and nephritis. His study of affections of the internal organs among the wounded is profound. Lang, Chernorutskiy, Gel'shteyn, and Bal'dman directed their work toward study of the outbreak of hypertonic disease in Leningrad in 1944.

In 1947 the work of the following scientists was honored by the Stalin prize: the work of Arinkin "Puncture of the Bone Marrow," of great significance in correct diagnosis of hemopathic conditions; that of Tareyev, who suggested rational methods for the treatment of malaria on the basis of a more profound study of the condition of the internal organs in the course of this disease; that of Yablokov, who made a study of the well-stocked arsenal of medicines made from domestic plants; that of Men'shikov, Reverdatto, and others.

Studies were made in the Experimental Therapy Institute of the Academy of Medical Sciences on the therapeutic action of rhodenates (sulphocyanates) of potassium (potassiumthiocyanate) in hypertonic diseases. Finally, in the Vovsi, Vinogradov, Gel'shteyn, Savits and Kurshadkov clinics the problem of nontubercular chronic diseases of the heart of frogs were studied. Palladin, Cherkes, Myasnikov, and Ryss made a study of the use of vitamins in hypovitaminoses and the nonspecific action of vitamins in diseases of the (blood) vessels, the gastrointestinal tract, etc. Such are the successes of our Russian therapeutic schools.

In 1946-47 a series of valuable suggestions were made on prophylaxis and on the medical treatment of diseases which yield to treatment with difficulty.

A. N. Gubarev (Rostov-on-the-Don) suggested a special preparation for the treatment of leprosy. He demonstrated the efficacy of this method by certain cases of recovery. Zil'bert suggested a new treatment for "tularemia." Berlin worked out a method of kouniss treatment for dysentery and is working on the use of kouniss for the treatment of gastric ulcers and diseases of the circulatory system. Sharpensk worked out methods of enriching bread with dry blood and albuminous preparations. This corrects the amino acid composition of white bread. Shub proposed a new kind of physiological anesthetization and of acceleration of births consisting in the utilization of vitamin B_1 for this purpose. Zil'ber and Yermol'eva prepared in their laboratory a new antibiotic substance of animal origin, "erythrin," applied effectively in the control of corynebacterium diphtheriae. Shubladze and Margulis suggested a special vaccine for the treatment of acute encephalomyelitis and diffuse and multiple sclerosis--a disease which has hitherto been considered incurable. In the struggle against tuberculosis much work has been accomplished in the synthesis of a series of chemical preparations, especially sulphone and sulphamide derivatives, and complex compounds with metal. Much has been done by Krasnobayev in the field of working out new methods of treatment for tuberculosis of the bone.

Highly interesting work was successfully carried by Sinitsin (Gorkiy) on heart transplanting and by the young Soviet doctor, Demikhov, on hemoplastic transplanting of the heart and lung in warm-blooded animals. Demikhov experimented on transplanting the hearts of dogs with a brilliant technique. One dog, into which a second heart was transplanted, lived 8 days without showing

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any serious signs of disturbance to the circulation. The general assembly of members of the conference convoked by the Moscow Oblast Chemical Institute recognized the great prospects of Demikhov's work and the preeminence of his technique in the transplantation of hearts.

Special mention should be made of the development of Soviet medical science in the national republics of the Caucasus and of Central Asia. It is sufficient to recall the names of the scientists Melik-Adamyan (Yerevan), Syzganov (Alma-Ata), and Topchibashev (Baku), and all the growing associations of scientists, grouped around the medical institutes founded by Soviet authority, in Frunze, Stalinabad, Tashkent, and Ashkhabad to gain insight into the growth and development of medical science in these republics.

Such are the successes of Soviet medical science in recent years. They might be even greater and of more significance if planning of medical science in the public health system were established properly. Unfortunately, this has not been the case.

The planning of scientific research work in the system of the USSR Ministry of Public Health was carried on up to April 1947 by various establishments and organizations of this ministry. The Academy of Medical Sciences, which had a Five-Year Plan for itself and its various institutes, organized a plan of scientific research. The scientific medical council of the USSR Ministry of Public Health and the scientific medical councils of the Ministries of Public Health of the Union Republics did likewise. Sometimes, individual establishments and organizations in the public health system worked out their own Five-Year Plans independently.

There was no unified plan for Soviet medical science. This situation could not serve the purpose of guiding medical science. It did not stimulate the creation of scientific schools or contribute to a rapid advance of Soviet medical science. It did not concentrate the efforts of scientists and workers on especially important problems of public health, the reduction of the morbidity and mortality rates among the population, and the development of wide spread measures to improve sanitation conditions. Futhermore, this planning was purely in the nature of a recommendation and not a directive. The plans developed were not put into proper form. They were published in brochures for voluntary reading. Planning of this sort cannot be called a state plan for science.

The prerequisites for the establishment of a unified plan have already been in existence for a long time. The basis for scientific experimental work has grown and become strong; nuclei of workers in medical science have enormously increased.

To Soviet medical science there were assigned more than 2,000 doctors of medical science and over 6,000 candidates in medical science, not including many thousands of scientific co-workers in scientific research institutes, assistants, et al. Our institutes, in general, are equipped with the apparatus and chemicals necessary for scientific research work. This equipment, however, should be replaced and improved in order to solve the problems assigned by the Five-Year Plan for scientific research work of the USSR Ministry of Public Health.

The government committee that investigated the organization and activity of USSR Ministry of Public Health in March 1947 found a lack of liaison between medical science and practical public health. It discovered that research was not planned or managed under the direction of the Ministry, and that the scientific research work of the institutes of the Academy of Medical Sciences and institutes which were directly under the USSR Ministry of Public Health and the Public Health Ministries of the Union Republics was developing without any specific direction or purpose and without consideration of the daily and primary needs of public health.

In its decision the government committee pointed out the necessity of establishing a unified Five-Year Plan for the scientific research work of the USSR Ministry of Public Health. This plan should indicate the basic trends

of medical science, corresponding to the growing requirements of public health, and provide assistance to public health agencies in improving the quality of medical service to the population. This plan, receiving assistance from public health agencies, should coordinate the organizations scientific research work with its inspection and control.

In April 1947, in compliance with these instructions, from the Government committee, the USSR Ministry of Public Health proceeded to establish a unified Five-Year Plan for scientific research work in the field of medicine. This plan (for 1946-1950) is a composite medical science plan, embracing chiefly the work of the scientific research institutes of the USSR Academy of Medical Sciences and the scientific research and medical institutes subject to the Union Republics.

This was the plan established at first. It included the work already accomplished in 1946 and the first half of 1947.

The great and extremely complicated work of creating this first plan was carried out under the direction of the scientific medical council of the USSR Ministry of Public Health in 2 months. After several conferences with a great number of the foremost representatives of Soviet science held under the direction of the Minister of Public Health, E. I. Smirnov, a list of the basic problems of medical science deemed essential for inclusion in the Five-Year Plan was prepared. On 14 May 1947, the Board of the Ministry approved this list in principle. Later, the scientific medical council of the Ministry, with the aid and closest participation of the Presidium of the USSR Academy of Medical Sciences assigned 200 scientists and workers in the field of medicine to assist in preparing the Five-Year Plan for scientific research The Plan was accepted in principle by the Board of the USSR Ministry of Public Health.

The collective work of scientists under the direction of the USSR Ministry of Public Health for the creation of the first unified Five-Year Plan for scientific research work was an important step in eliminating the gap between medical science and practical public health work in the future, by providing for proper control of the execution of the plan by the Ministry. The ties established between the medical scientists and the USSR Ministry of Public Health will be strengthened.

In the plan were included 27 fundamental problems, the quickest solution of which is essential for improved medical service and for more effective control of the morbidity and mortality rates among the peoples of the Soviet Union. However, these problems are not confined to practical consideration alone. The plan also includes purely theoretical problems which, unless solved, would make the solution of practical problems in controlling extremely prevalent diseases impossible and inconceivable.

First among such theoretical problems belongs the study of the biochemistry of albumins and carbohydrates, and of the decomposition of albumin and carbohydrates in the human organism. Without a solution to this problem, progress in any of the branches of medical science is inconceivable. The study of the structure and physicochemical properties of albumins and their transformation in the organism, aside from its enormous universal biological importance, is a prerequisite in solving many problems of physiology and dietetics in connection with the pathogenesis, prophylaxis, and therapy of the most diverse diseases, particularly, infections, malignant tumors (above all, cancer), traumata, shock, hypertonia, and other diseases.

Other theoretical problems are the study of physicochemical methods of observing the phenomena of life, the study of the higher nervous activity, and the examination of the problems of inflammation.

The most important sections of the plan are devoted to the problem of cancer and its control, to hypertonia, diseases of the blood vessels and heart and their treatment, the most serious infections and their control, preservation of the health of industrial workers, search for new medicines and investigation of the mechanism of their action preservation of the health of women and children, study of physical factors (health resorts, physiotherapeutics) and the mechanism of their effect upon the organism, sanitation of water supplies and ventilation, and nutrition for the healthy and the sick.

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Among the problems whose solution will aid the public health agencies to improve the quality of treatment for the most prevalent diseases, it is necessary to point out the problems included in the Five-Year Plan for the scientific research work of the USSR Ministry of Public Health: problems of prophylaxis and treatment of ulcerous diseases of the stomach and duodenum, tuberculosis, rheumatism and diseases of the joints, and chronic nonspecific diseases of the lungs. An important place in the plan is given to the control of traumatism and its consequences, and the treatment of disabled veterans of World War II. Finally, problems of prophylactic and medical treatment for trachoma and glaucoma and also for syphilis and gonorrhea are included in the Plan.

This Five-Year Plan does not merely list the problems, but it includes an "annotation" for each topic. The annotation assigns a given problem to the field of medical science to which it belongs, and in addition states how world science has progressed in this direction, what the situation is both in the USSR and abroad, and the objectives determined under the Plan. Thus, the unified Five-Year Plan eliminates one of the great defects of previous plans. The new Plan gives a clear picture of the basic and most important problems of medical science that are of universal State interest, of the status of scientific research work on these problems, carried out both abroad and at home. It also indicates distinctly where our scientists are ahead and where they lag behind, and in what direction it is necessary first to develop our scientific research work in order "not only to overtake but to surpass the achievements of scientists abroad" (I. Stalin).

In addition to the problems included in the plan, scientists will work on a whole series of other problems, but they will know that the State expects their greatest concentration on those problems of prime importance to the whole State. The present scientific staffs of the public health system will also concentrate on the solution of problems of paramount practical and theoretical importance which aid the rapid and progressive development of Soviet medical science.

The Plan took into account the potentialities (equipment, staffs) of the scientific research institutions of the USSR Ministry of Public Health system. However, like any other prospective plan this Plan also includes problems whose more rapid solution would demand improvement of the institutions medical technical equipment.

The Five-Year Plan for the scientific work of the USSR Ministry of Public Health, approved by the Board of the Ministry on 11 June 1947, demonstrates that it is possible to systematize medical science on a state-wide scale. Complex organization of scientific research work must be founded on planning. On this same principle, work pertaining to the solution of problems of regional pathology must be organized. These problems should be solved first by the teaching staff of outlying medical institutes, and also by the scientific research institutes of the republics, krays, and oblasts.

The collective body of scientists, carrying on medical work in the oblast and the USSR Ministry of Public Health, bringing together an enormous number of doctors, who are also taking part in scientific research work, are fully determined to fulfill and to exceed the Five-Year Plan for the scientific research work of the USSR Ministry of Public Health.

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