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MEDICAL CARE IN THE USSR

Report of the U.S. Delegation on Health Care Services and Planning

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May 16—June 3, 1970

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FOREWORD

The John E. Fogarty International Center for Advanced Study in the Health Sciences, National Institutes of Health, initiated in the summer of 1970 a project for the study of medicine and public health in the Soviet Union. The purpose of this project was to advance U.S. knowledge of medicine practiced in the USSR, to publish selected documents covering all phases of Soviet medicine and health and to improve cooperation between clinicians, health scientists and health administrators in the U.S. and USSR. Subsequently this effort was expanded to include studies of a small number of other countries, the systems of which contained certain unique or interesting features, and now has been incorporated into a Geographic Health Studies Program. In establishing such a program it was believed that an understanding of such aspects of other countries' health systems will significantly assist the leaders of the American health system to place in proper perspective our own policies, procedures, and interests.

This monograph represents the combined observations of individual members of the delegation and was coordinated by Dr. Patrick B. Storey. The group visited the Soviet Union in 1970 under sponsorship of the U.S.-Soviet Cultural and Scientific Exchange Program. It was not intended to be a comprehensive treatise on Soviet medical care nor an in-depth study of any particular aspect. However, the delegation was able to obtain an overall view of the health system and to make site visits to a number of Soviet health institutions. These, recorded with astute observation and the personal flavor of the author and delegation, give the monograph a feeling of reality that is otherwise so often missing from usual studies. For this reason it was felt that the monograph should have a wide audience. It gives the reader a wealth of information as well as a sense of participation. Information needs to be combined with empathy to create understanding and in pursuit of this objective we believe this publication fits well the Soviet Health Studies Project Geographic Health Studies Program.

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Introduction

According to Lewis Carroll's whimsical Alice, words mean exactly what she wants them to mean. But Alice's Wonderland was an unusual world. In the real world, words have their own meaning, and it behooves us to pay close attention to them in our desire to communicate, for they themselves can change the world. This is especially true in interpreting one culture in terms of another, for words serve as guides in that exploratory process.

W. D. Snively, M. D., medical director of Mead Johnson Laboratories, in his beautiful little book "Paganry of the English Language," (1) pointed out the changes which have taken place in the meaning of words as they are influenced by different cultures. And surely, one of the first painful lessons about another language is that a very similar, if not identical, word may have quite a different meaning.

It is also true that exact equivalents do not necessarily exist in two languages. Often an accepted equivalent is really based on a different cultural premise. Thus, the Russian word "zdravoochranenie" figuratively is translated as "public health" but literally means "health protection", including the system designed to attain that goal. The Russian word differs conceptually from the American notion of "public health" in that it encompasses all personal health care services to all members of the population and assumes the responsibility for such services being used to the limit of available resources. The premise underlying "zdravoochranenie" is completely different from that underlying "public health". It differs not only philosophically, but also in terms of the organizational implications in name and premise. It is this difference in implication which we seek to explore in the U.S.—Soviet health exchange program.

In 1958, the USSR and the USA entered into a formal agreement for cultural, educational and scientific cooperation. One aspect of this program involved through cultural missions the exchange of information and promotion of better understanding between the two countries. These exchange missions have included the areas of health care, biomedical research, and the

education of health professionals and research scientists.

Even before the inception of official missions, however, there had been unofficial visits after the USSR withdrew from the World Health Organization in 1950. Both these unofficial and official visits have been described in some detail by Dr. Joseph R. Quinn in his report of the exchanges.(2) In 1956 and 1957 there were four missions to the USSR and three missions from the USSR. With the Lacy-Zorubin agreement on January 27, 1958, and its subsequent extensions, there have been 23 U.S. missions and 22 from the USSR.

In May-June of 1970, the present team of American physicians visited the Soviet Union as part of the continuing process of exchange between our two countries in the health field. The purpose was to enlarge the American acquaintance with the Soviet health care system and to gain some insight into plans which the USSR may have for the future. That such plans were being actively formulated was clearly indicated by the Supreme Soviet of the USSR when it wrote into law on December 19, 1969, a new health code, "The Fundamental Principles of Health Legislation of the Union of Soviet Socialist Republics and Union Republics", to take effect July 1, 1970.(3)

Furthermore, a series of publications related to the fiftieth anniversary of the Revolution and to the centennial of Lenin's birth indicated a major step-up in preparation of health facilities, in numbers of health personnel, and in major changes in the qualifications of those personnel.(4) For example, the State Plan for 1970 called for hospital beds to be increased to 2,674,000 which would yield a proportion of 109.7 beds per 10,000 population, as compared to 96 per 10,000 in 1965.(5)

And finally a new five year plan for the national economy of the USSR for 1971-1975 included a document concerned with projections in the health care system through the next half decade as follows:

1. Further improvement and strengthening of the material-technical base of the health services;

2. Development of specialized forms of medical care;

3. Gradual approximation of the levels of care available to the rural and urban populations; and

4. Improvement in quality of both medical care and diagnostic and therapeutic care of the ambulatory-polyclinic network of the country. (6)

The visiting group was comprised of:

Dr. Jesse L. Steinfeld, Surgeon General of the United States Public Health Service;

Dr. John A. Cooper, President of the Association of American Medical Colleges;

Dr. Robert Q. Marston, Director of the National Institutes of Health;

Dr. Russell B. Roth, Speaker of the House of Delegates of the American Medical Association; and

Dr. Patrick B. Storey, Professor of Community Medicine of the Hahnemann Medical College and Hospital of Philadelphia.

Between May 16 and June 4 the group visited the health departments and selected health facilities of Moscow, Leningrad, Kiev, Kalinyka, and Tbilisi.

The hospitality and warm friendship extended to us by our hosts from the Ministry of Health of the USSR and of every city and facility which we visited must have exceeded even the legendary Russian standard. In addition to our medical and scientific work, we participated actively in the cultural and historical life of each of the cities and Soviet republics which we visited.

Our thanks are due to so many, but must be expressed specifically to the four men who accompanied us and worried about our welfare throughout the visit.

Dr. Alexei Georgievich Safonov, Chief of the Board of Preventive and Therapeutic Medicine of the USSR Ministry of Health, traveled with us. It was our great pleasure to get to know him, to enjoy his fine sense of subtle humor, and to develop respect for his knowledge and abilities. Mr. Vladimir Nikolaevitch Bobrov acted as our translator and all purpose problem-solver. He spoke English as well as any of us, was very conversant with American culture and knew how to expedite matters. Dr. Valerie Alexandrovich Limarev, Chief of the Protocol Section of the External Relations Board of the Ministry, also accompanied us on our tour. We changed a fast blow-out together on the road to Zhitomer in the Ukraine. Dr. Boris Fedorovich Kirillov, our man in Moscow, provided back-up services from the capital.

There were a great number of other Soviet people whom we met and who contributed to our edification. Dr. Simorot met us on our arrival and supervised the arrangement of our trip; Dr. Danilov hosted us at the Praga on our first "official" day; Dr. Shakhovsky and his lovely wife; Dr. Schepin; Dr. Popov; Dr. Golovtey—all of the Ministry of Health, also were of great help. We could not begin to name and properly express our appreciation to all the physicians in Moscow, Leningrad, Kiev, Tbilisi, and Kalinyka who were our "local" hosts, nor all the physicians at polyclinics, hospitals, sanepid stations, and educational and research institutions we visited. Some of them will be mentioned in the body of this report, but most will be mentioned only in the future when members of the American group meet from time to time and recount the details of this pleasant journey.

I. Semashko Institute for Research in Social Hygiene and the Organization of Health Care Services

Appropriately enough, our first visit in the Soviet Union was to the Semashko Institute, named after Dr. N. A. Semashko, who had been so instrumental in the early development of the Soviet health care system. Our host was Prof. I. D. Bogatyrev, Director of the Institute, ably assisted by Dr. M. Bantsekina.

The Semashko institute is directly responsible to the Ministry of Health. Its principal mission is to develop knowledge of the health care needs of the population, the requirements made upon the health care system, and the methodologies to accomplish the tasks for the Soviet public health system.

According to the Popular Medical Encyclopedia: (7)

"Hygiene is that branch of medicine which studies the influence of the conditions of life on the health of man and which works out measures directed towards prevention of disease and creation of conditions which assure preservation of health.

"On the basis of their study of the factors of the external environment the hygienists work out norms and practical measures which are useful for improving conditions of human life and for improving the health of the population.

"As a science which deals with the health of the broad working masses, hygiene has acquired the potential for unlimited development only under the conditions of the socialist society. Hygiene in the USSR is based on the doctrine of the unity of the organism and its external milieu.

"Previously a single science, it has been divided into several disciplines: community hygiene, hygiene of labor; food hygiene; hygiene of children and adolescents; and social hygiene, i.e., the organization of the health care system."

Social hygiene itself may be defined in its briefest terms as "the science of social health", and, as a scientific discipline, it is in a process of evolution which strongly involves medical organization and education.

This is best described by Prof. Bogatyrev in the Pirogov Annual Lecture for 1966. (8) In this lecture, Prof. Bogatyrev quoted a more detailed definition of social hygiene as given by B. Y. Smulevich. (9) "Social hygiene is the science which is concerned with the social problems of medicine, the positive and negative factors of the social environment which influence health, the role of health and the population's ability to work in economic and cultural development, the measures for the protection and improvement of health, assurance of work capability and human longevity. Social hygiene is closely connected with demography, the science concerned with the population, which studies the influence of the social environment on its structure (age, sex, professional make-up, etc.), on migrational process, and on the replication of the population (marriage, birth, death, increased longevity)"—to which Bogatyrev added the organizational imperatives for a scientifically based health care system, i.e., "a science concerned with the organization and direction of health care." And again quoting Bogatyrev: "It is perfectly natural that at a new stage of development of health care, this science and educational subject matter acquired the name 'social hygiene and the organization of the health care system'".

The critical point in this concept is combining social hygiene and health care services into a single conceptual and organizational framework. The Semashko is the "head institute" of an all-union system for approaching on a scientific basis the health care problems of the peoples of the USSR. It gathers the data, develops information, and proposes solutions. It sets up models to be field-tested. It organizes the exchange of information among the various agencies and personnel who must be involved in this effort.

Professor Bogatyrev's book "The Morbidity of an Urban Population and the Norms for Preventive and Therapeutic Care" illustrates this fusion of the con-

cept. (10) Some comments of Professor B. V. Petrovsky, Minister of Health of the USSR, at the First Annual Symposium on Social Hygiene and the Organization of Health Care Services also illustrate this point: (11)

"... the revival of social hygiene should be viewed as a new and important stage of the resolution of cardinal theoretical and organizational problems, as the establishment of new approaches to the problem of the role and interdependence of social and biological factors in health care and medicine, and rejection of a number of local and dogmatic positions.

"One of the causes of underestimation of problems of social hygiene was the tendency to resolve theoretical and organizational problems of health care by the administrative method, ignoring the need for penetrating scientific analysis of a galaxy of factors which immediately or remotely influence the health of the population.

* * *

"The more medical science is differentiated the more important and responsible becomes the role of social hygiene as a discipline which organizes the multifaceted scientific solution of important problems in health care..."

The principal and urgent task now before the Institute is to develop and use modern computer and statistical methods to analyze the changing health needs of the population. This would rationalize the organization and deployment of the health care service system.

Thus, the enormous changes over the past 50 years in the characteristics of the Soviet people, in their distribution between country and town, and their response to modern industrialization and the highly informationalized life must be accounted for. The solution of previously important health problems (e.g., poliomyelitis, tuberculosis, venereal disease) and the emergence of new ones, such as the degenerative and neoplastic diseases increasing with an increase in older people, require substantial changes when planning for facilities and types and numbers of health care personnel. A good example where the Soviet health care system has responded to the influence of the new social conditions under which man lives lies in the field of traumatology. Means of rapid access to the victims of trauma, but also for study and control of the conditions and consequences of trauma, are being developed. Another example is the development of vast regions of the Soviet Union, where whole new and rationalized communities and cities have been built with geographic, climatic, and communicational factors prop-

erly accounted for as they influence the lives of a universally and highly educated new population.

Professor Bogatyrev feels that social hygiene as a scientific discipline in the Soviet Union now stands at the juncture between the medical and the social sciences. Complex methods of investigation and analysis of the problems of modern life must be approached by physicians of the different medical fields together with other scientists such as sociologists, demographers, psychologists, economists, statisticians, etc., using modern methodological and electronic approaches. At the same time he warns against any attempt to approach these problems without physicians, since man's adaptation to his changing environment becomes a biological problem which rests squarely in the discipline of medicine.

Facts concerning the actual health needs of the population, together with those on development and the quality of service provided by health care institutions, should adequately serve as recommendations for planning, organization, and management of health care services. Professor Bogatyrev considers the widespread development of such studies as the next most important task for the combination of social hygiene and health care services. The only way to calculate the volume of work to be accomplished by each of these disciplines is through knowing the objective rules for development of the morbidity of the population and through having reliable demographic data. Such an approach will more accurately determine the number of physicians needed for the immediate years ahead and for the more distant future, and the number of hospital beds necessary to provide top-quality care without delay.

Bogatyrev argues for the experimental method in health planning and design. He extends this to the grand scale of the controlled experimental approach to the health program for whole new Soviet cities, based on the proposition that only the Ministry of Health of the USSR has the capacity to organize or control manpower and material resources necessary for such a contribution.

There is also the unavoidable need to experiment with rural health care services, a problem which the Soviet Union shares with many other countries but to a greater degree because of the vast distances in many parts of the country. Rural hospitals are not economically used, and are frequently occupied by many patients who should be in nursing homes. Physicians are unwilling to work in such hospitals, and patients are equally unwilling to be cared for there, preferring to be sent to the highly equipped and more expertly

staffed centers. With highways and telephone communications now being what they are, Bogatyrev proposes that medical resources be concentrated into centers with giant axes of motor transport, helicopter, or airplane service connecting health points designed for preventive or every-day care.

Another area of interest, which requires study, rests in the decision of the Party ultimately to bring the entire population into the "dispensarization" process. This will require a marked increase in volume of health

care work with consequent increase in manpower and facility resources. The problem of working out the best organizational approach to attaining this goal needs to be approached by clinicians, hygienists, and health care organizers. The need is urgent because of the lag in time caused by educating physicians needed for this kind of care.

These are the kinds of problems which are studied at the Semashko or under its direction. The structure of the Institute is shown in Table I.

Table 1.—STRUCTURE of the All-Union Semashko Research Institute on Social Hygiene and Organization of Health Care of the USSR Ministry of Health

1. Director's Office
2. Scientific Component
3. Division of Organization and Management of Health Care
(a) Section for the Organization of Medical Care for the Urban and Rural Populations
(b) Section for the Organization of Medical Care for Women and Children
(c) Section for the Organization of Medical Care for Industrial Workers
(d) Section for the Organization of Sanitary-Epidemiologic Service
4. Division of Social Hygiene and Statistical Investigations
(a) Section on Statistics of Health of the Population
(b) Section on Statistics of Health Care
5. Division for Computer Technology and Mathematical Modeling
(a) Section for Computer Technology
(b) Section on Mathematical Modeling
6. Division of Economics and Health Care Planning
(a) Section for Economic Studies
(b) Section for Health Care Planning
7. Division for the Scientific Organization of Work of the Workers in Health Care Establishments
(a) Section on Organization of Work
(b) Section of Development of Norms of Work
8. Division on Foreign Health Care
(a) Section on Problems of WHO
(b) Section on Social Hygiene Problems of Health Care in Foreign Countries
(c) Reference and Translations Group
9. Division on Scientific Organization
10. Division for Generalization and Propoganda of the Advanced Work Experience of the Health Care Agencies and Institutions
11. Division on the History of Medicine and Soviet Health Care
(a) Section on the History of Soviet Health Care
(b) Section on the History of Medicine
12. Museum
13. Scientific Library
14. Administration and Management

II. The Soviet Health Care System

A. General Health Services

Organization

The Soviet health care system is an organized entity extending through the entire country. Though it has strong central direction from the Ministry of Health in Moscow, considerable differences exist. Modifications have been introduced by the separate republics of the Union, even at smaller administrative divisions related to the "krai" or the "oblast" level. This organizational pattern for the health care services together with the corresponding governmental subdivisions are shown in figure 1. (12) Information flows in two directions: across, to the corresponding level of government; and up, to the Ministry in Moscow. It is characteristic that the directional emphasis of such information flow is determined by the level of significance of the decision involved. Thus, the Ministry in Moscow is responsible for developing the 5-year plans, but the republic ministry of health is responsible for the 1-year plans which move toward that republic's attaining the goals set by the central Ministry.

Such a pattern allows local modifications to meet local needs with immediate local cross response of the political and economic systems.

The All-Union Ministry of Health in Moscow (Figure 2) is responsible for:

1. Providing all health care services, personal and environmental, therapeutic, or preventive. This does not imply operational or financial responsibility for actual services rendered. This, and maintenance of the health care facilities, is the responsibility of many agencies, particularly industry, trade unions, other branches of government, etc., which are obligated by Soviet law to participate in the nation's health care program;

2. Controlling the educational system which produces the providers of medical care in categories and numbers specified; and

3. The research program for all aspects of medical care necessary to determine and meet the needs of the USSR.

The heads of various Boards of the Ministry of Health or their assistants relate to the Chairmen of the various corresponding Councils of the Ministry. The collective principle in decision making operates through the "Collegium of Medical Councils" which sets the policy of the Ministry. The membership of the Collegium includes the Minister of Health, the Chiefs of the larger Boards, and the Chairmen of the Councils, including the Chairman of the Council on Drug Production.

On our first visit to the Ministry we met with some of the men responsible for the work of the Ministry. It was our pleasure to meet:

1. Dr. A. G. Safonov, Chief, Board of Internal and Preventive Medicine;
2. Dr. D. Pavlov, Chief, Board of Sanitary Medicine and Epidemiology
3. Dr. G. A. Popov, Assistant Chief, Board of Planning and Finance; and
4. Dr. Ivanov, Assistant Chief, Board of Medical Educational Establishments.

The function of the Board of Medicine and the nature of the medical care system for adults in the Soviet Union was described by Dr. Safonov as follows:

The BASIC HEALTH CARE SYSTEM is the "uchastok", or district. Such a district contains about 2000 adults with an assigned ratio of one internist¹ and one nurse for this number. A pediatric uchastok contains 1000 children and is served by one pediatrician and one or two nurses.

The polyclinic, or BASIC HEALTH FACILITY, of which there are 39,000 distributed throughout the Soviet Union, is free-standing or attached to a hospital. Both of these may serve the general population (also called "territorial") or may serve particular working populations, such as in the various industries. There

¹ The word "internist" is probably the appropriate English equivalent for the Russian "terapevt", who handles general medical care of adults. As with internists, there are all educational levels, with the same subspecializations. There is, however, no such thing in the Russian system as a "general practitioner" or "family physician".

STRUCTURE OF PUBLIC-HEALTH ADMINISTRATION IN THE USSR

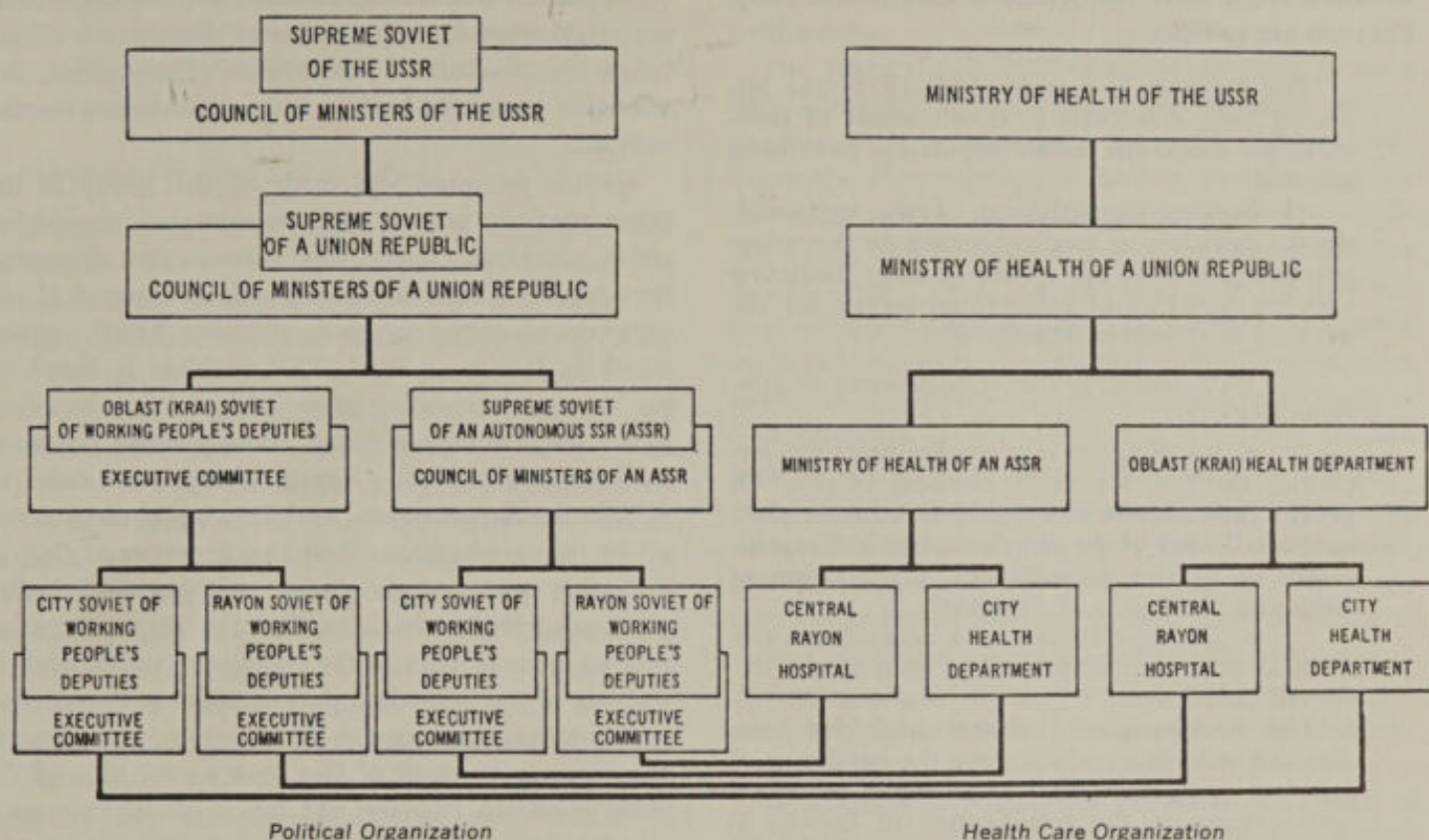


Figure 1.—Organization of Health Care Services in the Soviet Union*

"The Ministry of Health of the USSR directs the health services of the entire country through the Ministries of Health of the Union Republics, which in turn, give directions on special problems to the Krai* and Oblast* Health Departments of the Executive Committees of the Soviets of Working People's Deputies and the Ministries of Health of the Autonomous Republics. The Ministries of Health of the Union Republics conduct their work under the guidance of the Councils of Ministers of the Union Republics. The Health Departments are departments of the Executive Committees of the Soviets of Working People's Deputies, while the Ministries of Health of the Autonomous Republics are part of the Councils of Ministers of those Republics. This type of structure of the public-health authorities ensures, on the one hand, close links and interaction between them and all the branches of the national economy and culture and, on the other hand, qualified guidance on special medical questions on a unified basis for the whole country."

*Page 48, Public Health Services of the USSR



Figure 2.—Moscow. Ministry of Health of the USSR. Dr. Steinfeld and Dr. Cooper entering.

are 1,200 of the latter. Their financing is a responsibility of the particular enterprise and is worked out between management and trade unions.

The people who are served through industrial facilities may also receive care in the general polyclinic which serves their residential neighborhood. This appears to duplicate service, and references in the Soviet periodical literature cite the need for reducing this dual system to a single system of care. The group present at our meeting did not seem to feel there was a movement toward merging the two systems, but the new 5-year plan mentions the problems differently. Excerpts from the 5-year plan 1971-1975, especially item 1b of this projection, indicate that a movement

toward a single universal system of care is underway. Excerpts are as follows:

"For the next five years (1971-1975) the following basic directions in development of polyclinic service to the urban population have been adopted:

I. Further strengthening of the territorial-district principle of medical service to the urban population and of the system of shop districting with maintenance of preferential service for the workers at industrial enterprises.

With this objective it is planned to continue work on:

a. breaking up into smaller units the territorial districts for adult medical service. Of great significance in this regard is accurate planning of all work of the polyclinic, efficient organization of patient consultations, organization of work and placement of personnel;

b. the development of a network of open medical units and shop medical units in the territorial polyclinics.

"The amalgamated hospital and the free-standing polyclinics which serve the employees of attached industrial enterprises ought to assure improvement in the qualification of doctors in the area of occupational hygiene and physiology, in industrial toxicology, and in the diagnosis, management, and prevention of industrial illness and trauma. A revision is planned of the network of territorial polyclinics and of the polyclinics of the medical units of industrial enterprises, differentiation and refinement of their function in the area of providing medical service to industrial workers, (numbers, type of factory, etc.) with the objective of maximum avoidance of duplication in delivery of medical service and wasting of medical personnel," (ed.)

c. extension and improvement of the dispensary method of service of the population (and primarily of industrial workers)."

The terms "dispensary" and the "dispensarization" process have their own special meaning in the Soviet system of health care. They combine the concept of long-term management of a single disease (e.g., diabetes, hypertension, TB) with that of maintenance of health or prevention of disease. In the Soviet health care language, prevention of disease is covered by the word prophylaxis and one seldom sees reference to therapy without mention of prophylaxis—either of the disease or of complications of a given disease. Thus, the dispensarization process is maintaining health, which includes both treatment and prevention of disease. For example, any patient with treated carcinoma of the uterine cervix will be especially followed for that. Similarly, any woman can be screened for carcinoma of the cervix to maintain health.

To place the entire population under the dispensarization process—for any number of diseases—is a long range objective of the Soviet health care system, but adequate personnel and facilities have yet to be developed.

Specific reference was made by this group to the effect that the process of dispensarization should become universal. There was considerable discussion here because dispensarization, with its categorical imperatives, counters a comprehensive health system which is family oriented. This problem is based on our own understanding of general practice, however, where medical care is dispensed by a single physician taking care of an entire family. This concept does not exist in the Soviet system, and, because of the absence of the family physician, these two processes of dispensarization and comprehensive neighborhood health care can coexist. In actuality, the dispensarization process is an adjunct to the polyclinic process and, in the case of the individual patient, there is always close collaboration between the dispensary and the general care system. In point of fact, one survey showed the same physician carrying out two types of care on a scheduled basis for the same patient. Thus, it appears that what seems to be a discrepancy at the theoretical level has been solved by the Soviet system at the practical level.

One aspect of dispensarization is preventive screening for the entire population. Two examples of this are as follows:

1. In the case of tuberculosis, set policy dictates that every non-TB patient have a chest X-ray every two years. The Ministry of Health is obligated to allocate resources toward attaining this.

2. Cancer control measures are to be carried out for all women from the age of 25 up, on an every six months basis. Such examinations include more than cytologic screening for cervical carcinoma. Reference was made to a "mirror examination" where a number of other diseases are also checked out. It is most important to note that the examination offices² are not necessarily run by physicians but by middle level health care personnel under physician supervision. If there are questions concerning a finding, obstetrical assistants,³ for example, refer the patients to the doctor.

² A better word would be "survey offices". The Russian word is "osmotrevie".

³ An obstetrical assistant, akusherka. The word is the Russian diminutive for akusher, "obstetrician". The akusherkas, feldshers, and nurses are the principal categories of "middle level" health care personnel in the Soviet Union.

Some of our field trips were directly related to Dr. Safonov's presentation on primary patient care, and will be considered here. Subsequent sections of the report will consider further this initial discussion at the Ministry of Health.

Polyclinic-Hospital Combination

Hospital No. 58 in Moscow is a combined⁴ establishment having within it one hospital and two polyclinics for servicing the general population. It serves a population base of 92,000 people of the Rayon Perovsky. In addition to the hospital facility and the polyclinics it also has two ambulatory centers and four "medsanchasts" to provide service to the employees of several industrial enterprises located nearby. It also carries out dispensarization therapy, in addition to which there are other dispensaries near-by for tuberculosis, venereal disease, dermatology, children's diseases, and women's diseases. These dispensaries, while not an integral part of Hospital No. 58, are considered by the Administrator of the hospital to assist them in providing care for 92,000 people of the rayon.

The rayon⁵ is divided into 42 "uchastoks". Each uchastok has one physician called the "uchastkovy vrach" (district physician), who in terms of his medical specialty is a terapevt. It must be recalled that we are now talking about only the service for the adults of the region. Each terapevt is responsible for one uchastok and on the list of terapevts posted in the lobby of the polyclinic the name of the terapevt for each uchastok is listed.

The polyclinic also provides service for children. The same population base of 92,000 people is divided on a different basis for providing pediatric services to children through 14 years of age. This is an entirely different system of health care, with a different administrative structure, a different ratio between population served and numbers of physicians (1000:1 as compared to 2000:1 for adults) and a different ratio between doctors and nurses (1:1½ as compared to 1:1 for adults). Furthermore, child care is fed into a different back-up system from the adults. Parenthetically, as will be brought out in this section on medical education, it is interesting that this separation between adults and children also exists in the medical institute

where, if a student is to become a pediatrician, he follows an entirely different track from one who is to treat adults.

The hospital-polyclinic complex operates its own Neotlozhnaya Pomoshch, which provides home service to patients on an emergency basis. The difference between the Neotlozhnaya Pomoshch and the Skoraya Pomoshch is that the first provides relatively simple home care and the second more complicated care for sudden illness. Thus, if a physician from the Neotlozhnaya finds a patient in whom he suspects myocardial infarction he calls the Skoraya. The Skoraya then sends out a specially equipped cardiac ambulance.

A physician now works a 6½ hour day. Of this time he spends three hours in his office at the polyclinic seeing patients, and devotes three hours to home visits. The extra half-hour per day is accumulated, and he must spend two O.D.⁶ days per month on the Neotlozhnaya Service. In this way the group of district physicians covers the polyclinic's patients on a 24-hour basis, the need to make home visits, and the need to provide unscheduled service at the patients' convenience.

In addition to this regular polyclinic work each of the terapevts at this installation must spend six months out of every three years working in the hospital. The purpose of this hospital tour of duty is to keep him abreast of newer aspects of patient care and informed on new developments in hospital service.

A most important point to realize is that feldshers⁷ do not work in this polyclinic environment. Patient care is provided only by doctors and nurses.

Some of us visited the polyclinic itself, saw the physicians at work in their consultation rooms, looked over the registration section, and reviewed some of the clinical records. The record system for the polyclinic is compact and the clinic records are kept right behind the counters in the registration and triage section. The clinic record form has been in use for the past 16 years. Until very recently all records were handwritten

⁴ The Russian equivalent is "dyezurniy". In our system the on-call system in hospitals comes close to describing it.

⁷ A feldsher is a medical worker peculiar to Russia. The Swedish name dates to his historical antecedent which is the field surgeon of the 17th Century German and Swedish armies. Imported into the Russian army by Peter the Great at the opening of the 18th century, the feldsher retired into civilian practice, playing a particularly important role in the vast rural reaches of Russia. His role and his educational status have been amplified greatly in Soviet times, but contrary to common conception he is not a substitute for a doctor—except in unusual circumstances. He is used only until such time as sufficient doctors are available to staff the health care system of the entire USSR.

⁴ The Russian word used in the 5-year plan is "obyeynyonnie" which can be translated as "combined" or "amalgamated".

⁵ "Rayon" is a region. It is a specific Soviet term referring to the ecologic grouping of people. Three other terms of different magnitude are the "uchastok" or "district" of a rayon; the "oblast" or "province"; and the "krai", which should be translated as "territory" in the sense of "Oklahoma territory".

by the physicians but today there is a complete conversion to dictated typed records. A steno pool receives dictation directly from the polyclinic offices and by telephone hook-up also receives directly reports dictated from patients' homes.

There was a separate section of the building for handling trauma cases, with its own receiving section, its own X-ray unit, and a small operating room for handling minor problems. Anything of serious nature is shunted directly into the hospital.

Others of our group visited the hospital proper, and accordingly ran into one of the constant puzzling features of the Soviet health care system—at least for an American physician to deal with. In Russia, there seems to be less concession to the amenities of hospital life or to the "comfort index" for hospital care in terms of the physical layout. It seems unbelievable that the Moscow hospital was only 12 years old. In a society which builds the world's most magnificent subways, there is a considerable contrast with hospitals, hotels, and apartment buildings. This may exist as a result of the enormous postwar reconstruction problems. The Moscow hospital, for example, looked as though it had been erected 30 or more years ago, and had only been used as a hospital in recent years. Patient facilities were limited, and multiple bed accommodations are the rule, with beds placed head to foot on each side of the room. The central aisle was big enough to get only a stretcher through. No boxspring or inner spring mattresses were in evidence. In the surgical section patients were in beds in the corridor. There were no bedside tables, no clothes lockers, no screens or curtains, and communal lavatory facilities showed much corrosion. The several identical operating theaters were interesting. They were not grouped together as any kind of surgical suite. Rather there was one operating room per floor, each with its full staff, which in case of the general operating room used for round-the-clock emergency surgery required four shifts of personnel.

The typical surgical suite was large with a high ceiling, cracked and chipped tile walls, and a floor that had suffered damage from heavy rolling equipment. The operating table appeared to be outdated although overhead operating room lights were, in general, adequate and reasonably modern by our standards. Gas anesthesia machines looked worn and obsolescent. In the orthopedic operating room a portable X-ray machine stood in a corner draped with a piece of plastic and appeared to be in need of repair. The orthopedic surgeon was quite proud of his adjoining darkroom for immediate film processing, which was a

simple elementary black tank with a compartment for developer and fixer and a tub for washing. There seemed to be no provision for explosion-proofing of the operating rooms.

Granted these negative elements the impression is not to be conveyed that the hospital was dirty. On the contrary, the hospital was immaculately cleaned so that scrubbing of the floors and walls may have been a factor in wearing them out.

The urological department consisted of a small, single-windowed 10x14 foot room with chipped enamel iron cystoscopic table, a pole from which to suspend an open reservoir for irrigating fluid, a pan for instrument soaking, and a cabinet with a few rubber catheters, numerous metal sounds and bougies, and three Russian-made cystoscopes of assorted size. There was no X-ray equipment in the cystoscopy room, so it was concluded that when retrograde pyelographic studies are made, the catheters are introduced in the cystoscopy room and the patient then transported to the radiology department on another floor where films are made on a regular flat X-ray table. There is no full-time urologist among the 100 physicians on the staff. A urological consultant comes twice weekly to do necessary diagnostic work. Prostatectomies and nephrectomies are done by the general surgeons. If a case is deemed to need a special urological work-up or treatment he is transferred to a Urological Institute which might be found at a medical institute complex or in a higher level general hospital, such as an oblast hospital which serves a number of rayons.

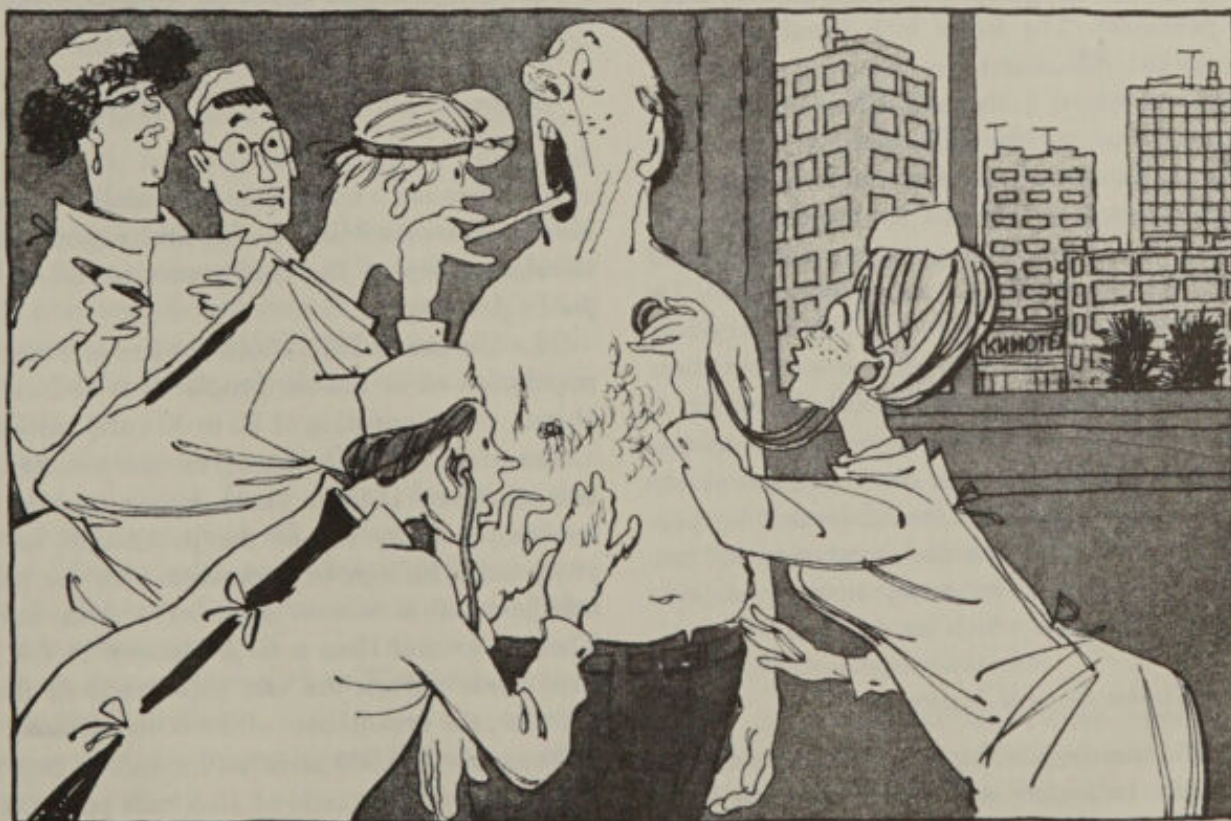
Leningrad—Appraisal of a City Health Program

In Leningrad we were given an overview of a city's health care system by Dr. T. M. Korotkova, Deputy Minister of Health. There are about 2,000 establishments for preventive-therapeutic care in the city. This includes 150 hospitals, 600 facilities for ambulatory care, and 60 children's polyclinics. There are 25,000 doctors and 55,000 middle medical workers. This is an interesting ratio of 1 to 2, as compared with a ratio of 1 physician per 3.5 middle medical workers for the entire Soviet Union. (13) This reflects the world-wide problem of physicians preferring big cities so that feldshers must consequently be substituted for them in small towns and rural areas. Soviet awareness of this problem is depicted in a cartoon from the August 1968 issue of *Krokodil* which shows one elderly physician struggling with a load of patients in a rural area, while 5 young physicians assault a single patient in the city (fig. 3).

young physician graduates of the medical
institutes often avoid assignments to rural locations
Молодые врачи — выпускники меди-
цинских вузов нередко избегают на-
значения в сельскую местность.

Where it's sparse . . .

ГДЕ ПУСТО...



...А ГДЕ ГУСТО
and where it's dense

Рисунок Л. САМОЙЛОВА
Drawing: L. Samoylov

Figure 3.

There are 12.7 hospital beds per 1,000 population. The national figure for the USSR in 1967 was 10.1 per 1,000.

The health care budget is adopted by the Leningrad City Council, following norms and standards set by the Ministry of Health of the USSR and by the Supreme Soviet. Twenty-three percent of the general budget of the city is devoted to health care. This fund is divided among the 16 rayons of the Leningrad area. It is important to note, however, that in addition to this money, there are additional operating funds available through industry, transport, and other enterprises which negotiate trade union contracts.

As elsewhere in the Soviet Union, health care service is administered according to the *uchastok* principle, with 2,000 adults in each *uchastok* and 800-1,000 children.

The past 15 years have witnessed a change in emphasis toward more specialized primary medical care, a shift which is reflected in the medical school training program, the organization of services, and the content of the 1971-75 five-year plan. One example is the development of separate stomatological establishments, of which we were shown two.

Stomatology demands special consideration. In Russia, stomatology is one branch of medicine which has its own physician level practitioners and its own middle level personnel. The latter includes the dentists ("Zubnoi vrach", "Zahnarzt") who are products of a middle medical school ("meduchilische" or "technikum"). Specialty course No. 1905 produces a dentist in two years and 10 months beyond graduation from high school. He is trained to examine teeth, prepare them for filling, extract them, and carry out prophylactic care under the supervision of the stomatologist. In metropolitan areas such as Leningrad this supervision is close and the dentist's responsibility is more limited. In rural areas, however, his responsibility increases.

It may be strange to us for the Soviet system to distinguish between pediatric care, obstetric-gynecologic care, and general medical care for adults in their primary care approach, yet they find it strange that we separate the problems of the teeth, mouth and jaws into a distinct profession which we call dentistry.

The First Stomatological Institute

The First Stomatological Institute which we visited serves the entire Leningrad area. Located on the Nevsky Prospect in the center of the city, it acts as clinical training center for the stomatological faculty of the First Leningrad Medical Institute and as a consulta-

tive center for stomatologic problems referred by the stomatologic clinics of the rayons.

One of our group had visited this Center in 1962. At that time there was only one imported turbine 300,000 rpm dental drill. On this current visit the entire service area was equipped with turbine equipment of the trademark Chirdenta. Much of the old equipment was converted to use for the student teaching programs.

We were also shown the Stomatological Polyclinic for the Derzhinsky Rayon, a rayon with a population of 150,000.

The great bulk of the dental work is scheduled on the basis of routine examinations carried out throughout childhood and young adulthood. The principal emphasis is on prevention and, accordingly, there is a concentration on dental examinations for healthy children.

Legislation is now in effect to require fluoridation of all water supplies in the Soviet Union, with a five year time limit for areas where it does not already exist.

Whereas previously a great deal of stainless steel had been used for crowns, bridgework, and the like, the emphasis is now on plastics and gold. Gingival disease is apparently a major health care problem. Consequently, some interesting treatment routines have been developed. One approach involves hydromassage with vitamin-fortified irrigating fluids.

Ukrainian SSR—Aspects of a Republic Health Program

In Kiev we visited the Ukrainian Ministry of Health where the Minister, Dr. Brattys, presented a detailed overview of the health care system of the Republic Ukraine.

The Ukrainian SSR, about the size of France, has a population of 47 million people. It is divided into 25 oblasts, each consisting of 20 to 30 rural rayons.

There are 115,000 doctors, or one per 400 population (2.5 per 1,000). There is one middle medical worker for every 120 of the population, or 3.3 per physician. This can be compared with the physician-middle medical worker ratio of 1:2 in Leningrad. There is greater than a 60% increase in the proportion which reflects the vast rural areas of the fertile Ukraine, the breadbasket of the Soviet Union.

There are 490,000 beds, an increase of 30,000 since 1967. This yields a ratio of 10.3 beds per 1,000 population (9.9 in 1967).

Again the administrative unit of care is the *uchastok*, which contains about 2,000 adults. In addition

there is a system of specialized dispensarization which is supportive of the territorial polyclinics.

Throughout the Ukraine there is a ramified network of drugstores, providing one pharmacy for each 8,000 people. This system is not under the Ministry of Health but under the Ministry of Medical Industry.

Urban Rayon Polyclinic in Kiev

This polyclinic is not far from the center city and works in combination (uyedinenie) with a 500-bed hospital located about two blocks away. It serves a population base of 50,000 people. The bed-population ratio is thus 10 per 1,000 which is the same ratio as that of the Ukraine and the USSR as a whole.

The polyclinic operates in the territorial system, and its functional division is uchastoks of 3,000 people each. Note the difference from Moscow and Leningrad where the uchastok contained 2,000 people. Each uchastok is served by a combined team, which includes all the narrow specialists and is headed by a terapevt (internist). In terms of numbers, there are 1.5 internists for each 3,000 people (the normal proportion seen elsewhere), and one ENT specialist for each six teams.

All specialists are available at the Polyclinic, and all laboratory tests can be done either at the facility, or at home as part of the Neotlozhnaya service. This polyclinic also serves as a teaching center for the Kiev Medical Institute, with the Institute's clinical departments located there and at the hospital. This feature makes very high level service available to this facility.

With reference to physician service, a rotational system is used between polyclinic and hospital. The differential length of service between clinic and hospital differs for each specialty. For example, an internist spends nine months per year at the polyclinic and three months in the hospital, whereas a surgeon spends six months in the polyclinic and six months in the hospital.

There are nineteen territorial uchastoks in the rayon served by the polyclinic. There are 200 doctors on the staff, and 1,200 workers in all. Two main functions, prevention (prophylaxis) and dispensarization, were described by our host. Examples of implementing the preventive function were:

1. guaranteeing an annual chest X-ray for all persons seen at the Polyclinic;
2. assuring that all women be seen for cancer control purposes;
3. conducting a health survey program for workers, the nature of which depends on the type of industry.

Some examples of the dispensarization process were:

1. A rheumatological service, with all rheumatic fever patients under constant observation, and receiving prophylactic treatment every six months. Rheumatic fever was difficult to discuss since it is included in the rheumatoid syndrome which is part of the collagen-vascular and auto-immune disease spectrum. Apparently penicillin as prophylaxis for rheumatic fever patients is not followed.

2. Hypertensive vascular disease, which is divided into three stages: A first stage, which includes purely labile hypertension, for which patients are kept under observation and given physical environmental therapy but not chemotherapy. Environmental treatment may require that the patients participate in the program at a "prophylactorium", about which we will say more later.

A second stage, for which the patient is hospitalized prior to initiation of therapy. Dipazol is used, in addition to Rauwolfia, diuretic agents, and spasmolytic drugs, the last including papaverine.

A third stage, which is fixed hypertension with cardiac manifestations.

3. All patients with peptic ulcer disease are followed in a program which includes upper GI series and gastric analysis on a once-a-year basis. All patients with relapse are hospitalized and treated with ganglionic blocking agents according to the method of Professor Burchinsky.

4. All patients known to have achlorhydric gastritis have an upper GI study done every year as part of their dispensarization program.

The polyclinic was a well laid out new building with good equipment and convenient facilities for both patients and doctors. Some features facilitating work were interesting. The doctor's desk is designed so that certain equipment can come into play, and comfortable armchairs are provided for the patients in the hallway. Patient education is evidenced by the literature about the waiting areas, the posters, and even attractive blown-up color slides incorporated into some of the windows near the staircases. The check-in and triage system is clearly outlined in the entrance hall for both patients and doctors.

Sanitorium-Prophylactorium

The sanitorium-prophylactorium operates on the principle that some forms of disease may be interrupted by getting the patient away from the usual stresses of life. Sun, air and water therapy in a rustic environment which includes bath and shower treatments, paraffin and mud therapy, good diet, etc. will provide

a rehabilitative chance to a person showing early evidence of disease. Patients continue to work, but instead of going home after work they go to the relaxed environment of the sanatorium. We visited a prophylactorium on the outskirts of the city which was built and maintained by a printers' guild (fig. 4).

The director of the institution, Dr. I. M. Shchulipenko, gave us a reprint of his paper, "The Utilization of Oxygen and Polyvitamins in the Combined Therapy of Patients with Chronic Cholecysto-angiocholitis", published in *Vrachebnoe Delo* (Physicians Business) in 1967. The summary is as follows:

"The gaseous content of the arterial and venous blood, and the content of pyruvic and lactic acid in the venous blood of 65 patients with chronic cholecystoangiocholitis have been studied.

"Several patients showed arterial hypoxemia, venous hypoxemia, and increased arterio-venous oxygen difference. The majority of patients showed hyposaturation of the arterial blood with oxygen.

"Oxygen treatment in association with vitamins tended to normalize under the effect of oxygen therapy combined with vitamins."

This particular prophylactorium was built and operated out of the 30.5% "workers' share" of the contract between publishers and printers. This is the share of most negotiated contracts between management and union used for developing workers benefits, such as health resort areas and prophylactoriums.

Kiev Oblast Hospital

This hospital, extensive portions of which are under construction, was also visited. Our hosts were Dr. B. I. Denisyuk, Director of the Hospital, and Dr. V. S. Karpenko, Chief of the Urology Service. There was



Figure 4.—Kiev. Dr. I. M. Schulipenko, Director of Prophylactorium of Chronic Disease maintained by Printers' Union of Kiev.

beautiful German (Siemens) equipment for cytосcopy with image amplification and cinefluoroscopy. A fascinating piece of equipment which can fracture bladder stones into sand and gravel to be washed out through the cystoscope under direct cystoscopic vision was demonstrated to us. Called the Urat-I, the instrument operates not on the principle of ultra-sound, but by an electrohydraulic effect. Professor Yuri Yudin, its developer, has treated over 1,200 cases personally without major complication, in fact no complication other than occasional mild febrile responses in the day or two post-procedure. No damage to the bladder has ever occurred.

A \$250,000 contract was negotiated by Med-export and the U.S. Embassy for purchasing these instruments to be used in the States, but our informants did not know to which institutions these units would be going. They are also widely used in Europe. Professor Yudin is now working on an experimental model of a Urat-II.

Rural Health Care Service

This service is based on the rayon hospitals which have the rayon centers, or polyclinics, attached to them. Such hospitals generally have 300-400 beds. At this level special services are available which might not exist at the rayon level. Further down in the system are feldsher-midwife stations in small settlements which are supposed to give pre-doctor care, emergency care, and to operate preventive, sanitation, and public educational programs. It is at this level that the Russian feldsher has carved his special niche in medical history. However, as the medical education system provides more doctors and as the building programs establish more facilities and transportation, feldsher stations are being converted into doctor stations. In his presentation, Dr. Brattys referred to the great significance the Ukrainian Ministry of Health attaches to the development of its rural health service.

We had the opportunity to visit the Kalininka Rayon Hospital in the Ukrainian SSR (fig. 5). It is a typical rayon center, about a 4-hour drive west from Kiev into the Zhitomirsky section of the Ukraine in the Kalinin Rayon of the Bilin Oblast. The medical director of the center was Dr. Obuchov.

The rural uchastok is based on feldsher-midwife stations, 4, 5, or 6 of which make up a uchastok. There are 8 uchastoks in a rayon, and a variable number of rayons in an oblast.

The kinds of service provided at the rayon center are general therapeutic and preventive medicine



Figure 5.—Kalinin Rayon Hospital, Ukrainian SSR, Dr. Roth with Soviet Urologist.

through comprehensive polyclinic type services, maternal and infant care, dispenserization for chronic disease, and emergency medical care. At this level the Skoraya Pomoshch and the Neotloznaya are not separated as they are in Kiev. The work of the feldshers at the feldsher-midwife stations is supervised by a Rayon Center, and back-up resources to the Center are provided by the Oblast Hospital and Polyclinic.

The two main characteristics of the Rayon Center at Kalininka are: 1) the utilization of the territorial uchastok principle as the organizational basis for service, and 2) a stage-by-stage approach to developing comprehensive medical care for the people of the area.

The first maternity home in Kalininka was established in 1933, and in 1936 the first medical and surgical services. By 1941 five feldsher-midwife stations had been developed, with 16 doctors available at the rayon level. Everything was then overrun and destroyed by the war, so that the entire present system has been built during post-war years.

There are now 40 feldsher and feldsher-midwife stations in the rayon. There are 1,186 people working in the health care system, of whom 143 are doctors, a physician-population ratio of .79 per 1000 population. One will recall that the ratio for the Ukrainian SSR is 2.5 physicians per 1,000; and for the USSR in 1967 it was 2.53.

There are 557 middle level medical personnel, or 3.9 per physician. Compare this with 3.3 for the Ukraine, 3.1 for the USSR in 1967, and 2.0 for the city of Leningrad. This demonstrates the significance of middle level personnel in attacking the problem of health care services for the rural population.

There are 820 beds in total to serve the rayon, i.e., 10.2 beds per 1,000 population, which compares exact-

ly with the proportion for the Ukrainian SSR and for the USSR. The central rayon hospital has 250 beds. There is a complete new pediatric hospital and polyclinic under construction, as well as a new sanitary epidemiologic station "Sanepidstantsia", which unit of health service is described elsewhere in this report.

Georgian SSR—Survey of a Republic Health Program

The health care system of the Georgian SSR was described by our host, Dr. Y. S. Gavtaradze, First Deputy Minister of Health, in Tbilisi, capital of the republic.

Georgia is one of the oldest countries in the world with a historical legacy of 1,500 years. It was Christianized in the 4th century, and by the 9th century had its own academic system (fig. 6). It suffered many invasions throughout its history until 1801 when it was incorporated into the Russian Empire, thereby initiating a period of peace. Since the advent of Soviet rule the country has become industrialized, in addition to maintaining its role as a rich agricultural territory. It produces close to 90% of the tea produced in the USSR, 46% of the tobacco, and 50% of the manganese. It is world famous for its wines and cognacs. It has its own automotive industry and now smelts more steel per year than did all of Russia before 1917.

The population of Georgia is 5 million, and that of Tbilisi is 888,000 as of the 1970 census. The republic is subdivided into 3 large oblasts, which in turn are divided into rural and urban rayons.



Figure 6.—Tbilisi, Georgian SSR. Dr. Cooper and Dr. Roth at the Statue of Nikolai Gogol, 19th Century Author of "Dead Souls" and "The Inspector General."

There are 586 institutions for medical care in the Georgian SSR, which include 234 polyclinics; 120 dispensaries, of which 61 are for TB and 7 for oncology; 28 children's hospitals; 47 maternity hospitals; and 170 women's consultation centers.

There are 3.6 physicians per 1,000 population, which is the highest ratio in the USSR (2.5 for the Union, and 2.6 for Russia). The next closest to Georgia are Latvia with 3.3, Estonia 3.1, and Armenia 2.8.

The ratio of middle medical workers to doctors is 2.5, which is substantially less than the proportion for the USSR as a whole (3.1). It will be recalled that the proportion in the Ukraine was 3.3 and in the rural rayon of Kalinen 3.9. One out of every 274 people in the Georgian Republic is a doctor, and one out of every 106 is a middle medical worker.

A new organizational approach to providing health care service in the rural areas of the country is under development. The basic principle is to unify the feldsher-midwife stations into larger hospital complexes and gradually to replace feldsher stations with doctor stations. This reorganization has been recommended by the Ministry of Health in Moscow. Under the new reorganizational scheme the chief doctor of the rayon hospital will no longer be the chief doctor of the rayons. They will have separate administrative functions. The rayons are backed up by the hospital and polyclinic services at the oblast republic level.

Organizationally, the health care system is planned and run by a Collegium, consisting of 11 members who consult with the Minister. This is the major policy-making group, and includes the four deputy ministers and the head of legal services. It does not include consumer representation, which is accomplished in other ways.

The emergency medical system in Tbilisi is different from that of the other three large cities. This is described more fully in the section dealing with emergency care. The principal obstetrical hospital of the Republic is described in the section on health care institutes.

Factories in the Georgian Republic have medical stations where a feldsher is in charge. We visited three such factories, which produce respectively cognac, champagne, and tea. The feldsher in charge of the feldsher medical station at the Tbilisi Cognac Factory described the duties of the station. Basically, these consist of organizing preventive health programs for the employees of the factory; of taking care of minor injuries and illnesses; and of follow-up care recommended by the physician. The feldsher does not function in terms of a substantive diagnostic role, and the

actual performance of the preventive examination, for example, is accomplished by the physicians from a near-by hospital. In terms of any emergency problem of significance the feldsher simply has to dial 03 for the Skoraya, which in Tbilisi is merged with the Neotlozhnaya to cover all calls.

B. Back-up Specialized Clinical Services

A higher level of patient care resource exists in several forms. As mentioned above, services in the polyclinics and at the rayon hospital level were backed up by more comprehensive and more specialized services at the oblast level, the republic level, and at the national level of the USSR. Such resource facilities also figure in the research programs and in the educational programs (undergraduate, graduate, and post-graduate) of the USSR and its component republics, and may be related administratively to the USSR Academy of Medical Sciences or to the Academy of Medical Sciences of the individual Republic.

Institute of Experimental and Clinical Oncology in Moscow

Within the Ministry of Health of the USSR there is a Council which is concerned with the problem of neoplasms and their management. This Council is headed by Dr. N. N. Blokhin. Within the Council there are ten problem commissions. For example, there is a committee dealing with chemotherapy, one concerned with X-ray therapy, and eight other such commissions. There are 20 such institutes of oncology in the USSR. The Moscow and the Leningrad Institutes are the two principal ones, with the remaining oncological institutes under them. In contrast to the Leningrad Institute, the Moscow one is concerned with more theoretical than practical matters.

The Moscow Gamaleya Institute, or the Oncologic Research Institute, (fig. 7) is directed by Professor N. N. Blokhin who was attending a scientific meeting in Houston at the time of our visit. Our host was Dr. V. N. Gerasimenko, Deputy Director of the Institute. This is an Institute of the USSR Academy of Sciences.

The Gamaleya Institute is divided into three main divisions whose functions are:

1. The etiology of cancer. Studies in the areas of carcinogenesis, cytogenetics, immunology, etc.
2. New treatment methods, particularly in the area of chemotherapy. Emphasis is placed on developing management methods which use combinations of new and old media of treatment (complex therapy).



Figure 7.—The Moscow Institute of Experimental and Clinical Oncology: Dr. N. K. Gerasemenko in center.

3. Epidemiology and statistics. This section relates to the corresponding division of the Semashko Institute for Research and Social Hygiene and the Organization of Health Care Services.

There are 1,600 workers in the Institute. The budget runs about 4.6 million rubles per year; however, there are two sources of additional monies which can be tapped: 1) The Ministry of Health itself as a separate allocation; and 2) The State Commission for Science and Technology which has funds for independent projects. The latter source can provide as much as 20% of the total financing of a given institute.

In terms of its relation to the health care system of the nation the Moscow Institute serves as a central resource area. Most of its patient load is referred through an extensive referral system from all parts of the USSR, the most difficult problem of which is having the Moscow Institute available if the need arises. For example, Professor Marienbach will admit to the Urology Services of the Institute only those patients with testicular or renal tumors which have already metastasized to the retroperitoneum, lungs, or bone. While we were there, a radiological associate was carrying out venacaval catheterization on an out-

patient basis in a young Georgian boy from Tbilisi. Since the cavograms showed clear evidence of retrocaval metastatic nodes, undoubtedly related to the teratocarcinoma of the testis which had been removed earlier, it was concluded that the patient should be admitted.

The in-patient capacity of the hospital is 400 beds. Ten to 15 surgical procedures per day are carried out. The out-patient workload is 35,000 patients per year. The feeder system includes the 18 oncologic institutes mentioned earlier, and 300 oncologic dispensaries located throughout the Soviet Union.

There are plans for a new center to be built close to the present institute. It will have three times the resources of the present center, and will include four sub-institutes. It is scheduled to open in 1975. The money to build this new center was raised by a "subbotnik"⁸.

⁸ A "subbotnik" is a day of voluntary free work contributed by workers to a socially useful purpose. Prior to the 5-day work week being introduced, the only free day was Saturday (subbota)—thus the name.

Research Institute of Experimental and Clinical Oncology in Kiev

There are one or more oncological institutes in every republic of the USSR, and there are oncological dispensaries in every oblast. The Research Institute of Experimental and Clinical Oncology in Kiev is under the Ukrainian Ministry of Health, and was organized in 1960. It coordinates research in the field of experimental and clinical oncology in the Ukrainian SSR and functions as a consultative resource center for the medical care institutions of the republic. Contacts are maintained between the head institute in Kiev and the 37 extensions throughout the Ukraine.

Our host was Dr. R. D. Kavetsky, Academician of the Academy of Sciences of the Ukrainian SSR and Director of the Institute. Dr. Kavetsky had visited the United States in 1946 and 1961.

The hospital component has 200 beds and 700 workers, including 120 scientists at the Institute. Of these, 20 are doctors of medical science and 80 are candidates of medical science. Most of these have been trained at the Institute. It has a large polyclinic in addition to many newly constructed buildings for research and education. The principal lines of investigation are: 1) the pathogenesis of cancer, 2) the relationship between tumor and host, and 3) improved methods of diagnosis and treatment of cancer.

An extended tour of the grounds and facilities disclosed them to be newly constructed, spacious, well-equipped with a great deal of modern equipment, both Soviet and imported, and well-staffed with physicians, biologists, biochemists, biophysicists, radioelectronic engineers, etc. A most striking aspect of the staff is that 80% of the department heads who described their work to us made their presentations in English. One of the department heads pointed out that intensive effort had been applied in the past seven to eight years to increase the knowledge of English.

Tissue culture methods, use of electronic spin resonance, electron microscopy, infrared spectrography, utilization of laser for study and treatment of tumors, and an elaborate set-up for linear accelerator, cobalt, radiotherapy, and high voltage conventional radiation therapy were demonstrated to us. There were elaborate arrangements for radioisotope therapy and for clinical laser therapy, all modes of such treatment monitored by closed circuit TV. There seemed to be abundant, well-educated, energetic, and enthusiastic personnel. New construction was going on all around,

all of which indicated a prosperity which was quite striking.

But even with new construction we still noticed the tendency to put many patients in one room. For example, of two rooms for male patients, there were five beds in each, with only sufficient space between the beds to permit ingress and egress. Thus, this must represent custom rather than a lack of space in view of the general space allowed for offices and laboratories.

Institute of Pediatrics of the Academy of Medical Sciences of the USSR

The Institute of Pediatrics of the Academy of Medical Sciences is the head institute for pediatrics in the USSR, and has been under the Academy of Medical Sciences since 1922. Our host was Dr. T. Gronkovskaya, Deputy Director of the Institute.

The principal mission of the head institute is to plan and coordinate scientific investigation in pediatrics in the USSR. There are 15 other pediatric institutes in the country, and there are also about 150 departments of pediatrics at the various institutions of higher medical education, all of which report to this Institute in Moscow, which is responsible for proposing and assigning problems for study. The categories now receiving most attention are allergy, especially bronchial asthma and skin allergies; problems associated with premature birth; acute childhood infections, especially acute respiratory infection; the side effects from vaccines and preventive medicines; diseases of the blood, particularly leukemia and the hyperplastic and hypoplastic anemias; chronic non-specific pulmonary disease; diseases of the kidney; and physiology of aging, with a special clinic for healthy children. There is also a special division of the Institute for brain damage as a consequence of hereditary and congenital disease.

The Institute has 465 beds, with 10 divisions of roughly 30 beds each. It has 13 laboratories, and its own surgical division of 50 beds. It serves as a referral center for handling clinical problems. Some of its facilities are used for the training of students from the Second Moscow Medical Institute (Pavlov). It maintains an ordinatura program for the advanced clinical training of pediatricians, and also an aspirantura for developing medical scientists in pediatrics.

All-Union Institute of Pulmonology in Leningrad

The All-Union Institute is housed in a brand new building, exceedingly well-arranged and equipped for

patient service, research, and medical education. It is equipped with advanced and sophisticated equipment for measuring external and internal respiratory function, for pulmonary angiography and bronchography, cardiac catheterization, and for monitoring during surgery. The main operating table light contained a built-in television camera, so that a procedure could be monitored in detail in the observatory above the operating room. There was a reanimation center (which we would call a "resuscitation" center on literal translation—but probably an "intensive care" suite on figurative translation) which was also elaborately designed to display the most sophisticated of modern control equipment, some of which had not yet been installed into the receiving panels.

Our host was Professor F. G. Uglov, chairman of the Department of Surgery at the First Leningrad Medical Institute and Director of the Institute. Professor Uglov's own special interests include chronic interstitial pneumonia and asthmatic bronchitis. He has some interesting theories concerning the pathogenesis and management of these diseases based on the study of over 500 cases. Professor Uglov's textbook "Carcinoma of the Lung" is now in its third edition.

The Research Institute for Obstetrics and Gynecology in Tbilisi

The Tbilisi Institute is the head institute which serves the entire Georgian Republic in obstetrics and gynecology. It is also the operational base for the Department of Obstetrics-Gynecology of the Medical Institute in Tbilisi, and for the Institute for the Advanced Training of Physicians. The Director of this

Institute is Professor K. V. Chachava, shown in fig. 8 at the Institute.

The facilities for providing service and for conducting complicated diagnostic and therapeutic procedures were impressive.

The principal clinical problem in research is birth trauma, and the physical and electro-physiological methods needed for this research were worked out in this Institute. The technique for doing direct electrocardiography of the fetus was developed here in 1962 and reported in monograph form that year. Determination of the cerebral blood flow is accomplished by a physical method referred to as "rheophysiological" method, the tracings being called rheoencephalograms. Electroencephalograms of the fetus can also be recorded during the birth process. They have also developed a polarigraphic method for determining oxygen tension in the cerebral tissue of the fetus, and a technique for inducing hypothermia of the fetus which can be used when asphyxia is threatened. General hypothermia of mother and fetus has yielded excellent results.

Another interesting research project at this Institute is a method for determining the sex of the fetus early in pregnancy. This determination depends on the effect urine from the pregnant woman has on the sperm of frogs. Urine is added to a suspension of frog's sperm on a microscopic slide, which is then electrically polarized. The sperm move in different directions depending on the sex of the fetus. If male, the sperm cells move in both directions. If female, the cells all move towards one pole of the electrical field. Professor Chachava claims an accuracy of greater



Figure 8.—Tbilisi, Georgian SSR. Research Institute for Obstetrics and Gynecology. Prof. C. V. Chachava, between Dr. Steinfeld and Dr. Marston.

than 90%, effective from the eighth week of pregnancy on.

C. Emergency Medical Care: The "Skoraya"

Introduction

Skoraya Meditsinskaya Pomoshch, in its most literal translation, means "quick medical assistance". It might be translated literally as "rapid medical service", but the preferred term, though less literal, is "the emergency medical service". Two other terms have also been used, but neither are adequate. One, "forward care service", appropriately indicates one of its essential characteristics—that of bringing expert well-equipped medical care to the patient at his point of need—but the term needs definition in its own right. The second, "first aid", is inadequate because it implies providing minor service until such time as major medical help arrives. The Skoraya's capabilities go far beyond that.

According to the Popular Medical Encyclopedia: (7) "the Skoraya Pomoshch is the medical organization that brings first and immediate medical assistance in case of accidents (wounds, fractures, burns, poisonings, etc.) or sudden life-threatening illnesses (sudden loss of consciousness, acutely developing dysfunction of cardiovascular activity, of respiration, internal hemorrhage, etc.). The Skoraya stations not only provide service at the site of occurrence, but immediately transport those in need to the hospital as well.

"For provision of emergency service in the cities and workmen's settlements of the USSR Skoraya stations are organized; in rural regions the physicians and feldshers of the rural medical facilities provide emergency service. In cities where there are no Skoraya stations emergency service is provided in the daytime by polyclinic divisions of hospitals, and at night by some of the medical installations which have round-the-clock personnel.

"Emergency care is provided in the USSR free of charge, as are other forms of medical service.

"Hospitals are obligated to take without fail patients brought in by the Skoraya, regardless of the presence or absence of vacant beds . . .

"The Skoraya studies the causes of accidents and is involved in the introduction of appropriate organizational prophylactic measures for their prevention, for example, related to the regulation of street traffic, the guarantee of safety measures on city transportation, public instruction in the rules of street traffic, of the use of gas and electricity . . .

" . . . The ambulance should be sent out to the point of call in not more than three minutes after the call . . ."

" . . . The work of the Skoraya is regulated by an article established by the USSR Ministry of Health, March 16, 1949. Institutes of the Skoraya, organized in a series of cities of the USSR (Moscow, Leningrad, Kiev, Odessa, and others) are involved in the thorough scientific elucidation of problems connected with the organization of the Skoraya Pomoshch."

All public pay telephones in Russia are equipped with a push-button which obviates the need for a coin. Next to the button are engraved instructions to dial 01 for police, 02 for fire, and 03 for medical help.

On dialing 03 the call goes to the central station of the Skoraya system of that city. In Moscow, Kiev, and Leningrad this station is located near the center of the city.

Each central station contains a large dispatching section which controls the movement of vehicles and crews from that station or substations located strategically throughout the city. The system is designed to expedite medical care service and obviate transportation problems which so often separate the victim from emergency medical help.

Moscow

The Moscow central Skoraya station is the largest system of its kind in the world. Located adjacent to its own 600-bed hospital (The Sklifosovsky Institute of Emergency Medical Service)⁹, (fig. 9) it connects with 22 substations throughout the city. It also responds to countless other medical posts which are independently operated by institutions, factories, stores, hotels, transport systems, etc. One example is the Moscow Metro which has a medical post manned by five feldshers round-the-clock at each of 80 subway stations. The five feldshers have instant access to the Skoraya in case of need.

The Moscow Skoraya functions as follows:

1. It provides fast medical service to victims of accidents or sudden life-threatening illnesses wherever either occurs; it subsequently transfers these patients, when indicated, to medical installations.

⁹ The Sklifosovsky Institute was commissioned in 1923 as back-up hospital to the Moscow Skoraya and was reorganized 25 years ago to become a special hospital and institute for scientific research in the problems of emergency medical care. The Sklifosovsky works closely with the Moscow City Skoraya in developing new methodologies to perfect the Skoraya, and serves as a teaching center for Skoraya personnel from all over the country.



Figure 9.—Moscow. Main Entrance to Sklifosovsky Institute for Research in Traumatology and Emergency Medical Care. Headquarters and Principal Hospital of the Moscow Skoraya.

2. It assures hospitalization and transportation to patients in need of immediate hospitalization or mothers to lying-in hospitals.

3. It registers all hospital beds in Moscow, with a daily census and patient flow.

4. It delivers preserved blood to medical installations in case of emergency.

5. It organizes service and posting of medical personnel at events where large numbers of people are concentrated.

The Moscow Skoraya is organized as follows:

1. Administration. The general staff of the Skoraya is comprised of almost 2,000 personnel, of whom 300 are physicians, and 1,300 middle medical workers (feldshers, nurses, midwives).

2. An operating division, which receives all calls via telephone dialing of 03, guarantees Skoraya service and controls the work of the medical teams. The operating division is under the direction of a senior on-duty physician, who also represents the Director and his Deputy in their absence.

3. Twenty-two substations located in the different rayons (regions) of the city assure rapid service at the site of accident or illness any hour of the day or night. The majority of the substations are located close to large hospitals.

4. Four divisions for hospitalization and transportation are:

- a. Women in labor and gynecology patients;
- b. Patients with physical illness;
- c. Patients with acute surgical illness needing immediate surgical intervention; and
- d. Patients with infectious disease.

Each of these divisions has its own independent dispatcher for receiving hospitalization orders. Such orders are taken only from physicians in the polyclinic network throughout the city. Requests for hospitalization of women in labor or gynecology patients with bleeding are taken directly from the public. Hospitalization must be accomplished without delay.

Two-hundred vehicles operate in the daytime, and about 100 at night. All are radio-telephone controlled. Special telephone lines connect all the stations of the Skoraya and also the hospitals of Moscow.

The objective of the system is to provide maximum medical care in the shortest possible time at the place of need. To accomplish this, ambulances are manned by specially trained personnel, and are supplied with appropriate equipment including drugs and material for handling fractures.

Specialized ambulances have been developed in recent years due to the continued re-evaluation of the system. Their personnel and equipment have been adapted to handle myocardial infarction, shock, acute lesions of the cerebrovascular system, poisoning, and resuscitation. These specialized vehicles are considered laboratories of continued experimentation in which new methods are constantly studied, new equipment worked out, and new drugs tested prior to their regular use.

The Skoraya also includes a preventive aspect which is important. For example, the medical personnel must register all accidents with the Division of Traffic, the Police Department, the Moscow Soviet, the City Health Service, the Department of Education, and other organizations concerned with public safety. These agencies then analyze street and home accidents and develop preventive measures.

Fig. 10 shows the Novodevicky Monastery where Professor Yudin, former chief of surgery at the Sklifosovsky Institute, is buried.

Leningrad

The central station of the Leningrad Skoraya is located adjacent to the Leningrad City Department of Health in center city.

Its two functions are to provide emergency care in case of accident or sudden illness, and to provide transportation related to hospital care. All telephone calls via 03 come to this station. As in Moscow, the central dispatching office is divided into two parts—one dealing with the incoming calls, and the other with implementation after it has been decided what to do. Each component is supervised by a physician, and includes about eight workers, each of whom has a medical



Figure 10.—Moscow. Grave of Professor Yudin in Novodevichy Monastery. Renowned former Chief of Surgery at the Sklifosovsky Institute.

background at the middle level, either as feldsher or nurse. When a call comes to the receiving component, a card is activated. It is stamped with the time of the call, and then stamped in the dispatching section on disposition of the call. Elapsed time should not be more than one minute. On passing through we picked up a completed case, the time of which was one minute. The director of the Leningrad Skoraya informed us that help would arrive at the source of the call within six or seven minutes from the time of the call.

In terms of personnel, there are 300 doctors and 900 middle level medical workers who assist doctors. Of the latter, two-thirds are feldshers and one-third nurses. The doctors and assistants form teams or crews. (The word "brigade" is used in Russian.)

Leningrad, which is divided into 16 regions (rayons) thus has 16 corresponding substations of the Skoraya. There are also specialized sub-stations and specialized ambulance crews of eight types which can be summoned from the rayon stations when indicated, and which take patients directly to the specialized hospitals. These specialized ambulances deal with cardiology, toxicology, neuropathology, children from newborn to age three, severe trauma, shock, blood loss, and hematologic disorders.

There are two kinds of vehicles in use: 1) a "line" vehicle or general service ambulance, and 2) a specialized ambulance (fig. 11). All are set up for fairly elaborate diagnosis, prompt management (including resuscitation), and disposition of the patient. About 30% of the patients seen are hospitalized.

The line or ordinary crew, if it goes out first on a call, may summon a specialized vehicle and crew if the situation appears to require more competence.



Figure 11.—Leningrad Skoraya. Interior of Cardiac Ambulance. Feldsher demonstrates resuscitative equipment. Direct current disbrillator and cardiac monitor to his right.

In case of multiple victims, the doctor on duty may send several ambulances to the scene immediately, based on his evaluation of the information from the call concerning the size of the accident and the number of victims. Occasionally, several dozen vehicles have been sent to the scene within 15 minutes of the initial call. In such cases the duty physician must then more sharply screen the calls which continue to come in.

Experience has shown that with current ambulance equipment one Skoraya team, consisting of a doctor and two feldshers, can care for two victims in shock, or four or five severely injured. Given a situation with many victims (natural disasters, building collapse, explosions, etc.), the Skoraya brigades form a triage center in the nearest building. Patients are processed at the site and transported to an appropriate nearby hospital. (14)

Special radio frequencies are reserved for the Skoraya Pomshch throughout the Soviet Union. In Leningrad 300 calls a day are handled.

The Skoraya is a specialized subsystem of medical care, and physicians who elect to work on the Skoraya receive a six-month period of special training. From that point on special courses and educational activities deal with this specialty.

The Director of the Leningrad Skoraya pointed out several problems: 1) The relationship between the Skoraya and the Neotlozhnaya¹⁰ Service is sometimes

¹⁰ The Neotlozhnaya is the form of emergency service, particularly housecall type, provided by a polyclinic to its own patients. Physicians who practice at polyclinics devote a certain number of days per month to this service and each polyclinic maintains its own vehicles for this.

difficult to discern. In Leningrad there are 61 units of the Neotlozhnaya which provide home treatment, and who should and who in fact do handle the call can be confusing. In smaller cities the Neotlozhnaya is merged with the Skoraya, but in the large cities the two are separate and the solution to the problem, though under study, is not yet in hand. 2) The Leningrad Skoraya needs a specialized Skoraya hospital which would serve the Skoraya the same as the Sklifosovsky Institute serves the Moscow Skoraya. A 700-bed hospital for this purpose is now being constructed. 3) A special mobile laboratory which would amplify the facilities of the ambulances is needed for use with the Skoraya in certain kinds of cases and certain magnitudes of disaster. 4) Collection and analysis of data to render the Skoraya more susceptible to analysis must be improved to interpret any need for change. 5) A group of professionals always feels that it can in fact do better, and two particular aspects of this were brought up for discussion:

a) Quality control: An example of this would be the use of a two-sheet system for hospital verification of the diagnosis made by the Skoraya team. In 1969 there were 8.7% mistakes in diagnosis. With such a complex system, this sounded like superb performance, but the Director was dissatisfied with the high percentage.

b) An effort is being made to improve the capability of the "line" brigades relative to that of the specialized crews.

Kiev

The Kiev Skoraya is the oldest in the country, having been organized before the Revolution in 1902. A model of the horse-drawn vehicle used in those days was on the mantelpiece of our host. Our host in Kiev was Dr. N. A. Lengauer, an energetic physician who was wearing the medal of a "Hero of Socialist Labor" which she had obtained in 1968 for her long years of service in developing the emergency care system in her city.

The Skoraya serves 1.6 million residents of the city. In addition to the central station there are nine substations throughout the city, located in such a way that care is provided within five to seven minutes from the time of summons. There is a new residential district under construction in Kiev which will have a population of 350,000 people. Construction plans for this section of the city include a new substation of the Skoraya. A thousand-bed Skoraya hospital is presently under construction.

There are 125 vehicles on daytime duty, and 90 vehicles at night. Because Kiev lies along the Dnieper River and islands are part of the city complex, two speedboats are equipped as vehicles of the Skoraya to bring service along the waterfront and Dnieper islands.

As in Moscow and Leningrad the type of vehicle and its crew is either an "ordinary" (line) crew or a specialized crew. The ordinary team includes a doctor, a feldsher, and a driver, and is usually the first line of response to a call via 03. The crew can call for a specialized team, or the dispatching unit can make an initial decision to send out a specialized vehicle. In point of fact, most calls for the specialized ambulances come from line crews seeking added help or consultation.

The specialized ambulances include: three for cardiac disease and myocardial infarction; three for shock; one for hematologic problems, including hemorrhage and thrombosis; one for neurologic problems; one for toxicology; one for pediatrics (i.e., up to one year of age); and two for emotional problems.

All calls come into the central station and are handled in a manner similar to that of Moscow except for one feature. When a switchboard operator accepts a call, she activates a tape recorder which records the entire transaction. This allows for replay to resolve any subsequently developing confusion about addresses, time of call, or type of information provided. It also serves to evaluate the service for improvement.

From the center there are direct exclusive telephone lines to all substations, and direct radio contact on reserved Skoraya frequencies with all vehicles.

Presentations were made to us by three of the directors of the specialized services. Dr. D. V. Zilberman said three vehicles are used for the myocardial infarction service. Each team consists of four members in addition to the driver. This includes one physician, one lab technician, one feldsher with special training to handle the diagnostic and therapeutic equipment, and one junior medical assistant.

One of these vehicles answers calls for suspected myocardial infarction; pre-infarction syndrome; acute tachycardia; cardiogenic shock; acute pulmonary edema; or any expressed need by an ordinary crew such as to continue cardiac management initiated by them. Most trips out by the cardiac ambulances are in response to a call from an ordinary crew.

These ambulances are very well equipped with small compact electrocardiographs, a monitoring cardioscope, equipment to measure arterial and venous pressure, a direct current defibrillator, a pacemaker,

equipment for administration of oxygen and nitrous oxide, a portable laboratory which allows the laboratory technician to do blood and urine determinations on the spot, and all equipment necessary for artificial respiration and maintenance of circulation.

The resuscitative procedural displays in the crew waiting room feature the techniques developed by Dr. James Jude, representing a Soviet tribute to American work in this field.

The usual mechanism for cardiac ambulances is for an ordinary crew to go out first in response to a call from the family. All these crews have direct radio communication with the central headquarters, and the point was made that these regular ambulances are quite well-equipped in their own right to handle most situations (fig. 12).



Figure 12.—Kiev Skoraya. Cardiac Ambulance on Call. Dr. L. M. Schlaen, Cardiologist, standing next to ambulance with feldsher, technician and junior medical assistant.

One of the authors had the opportunity to go out on call with one of the cardiac ambulances. In this case, a line crew had radioed in for help, thinking that a patient complaining of chest pain might be suffering myocardial infarction. The vehicle proceeded with deliberate speed to the point of call. No siren was used, but it was clear that the traffic yielded to passage of the vehicle, and the driver passed through yellow and red lights, signalling with his horn when necessary. On arrival at the apartment building from where the call was made, the vehicle pulled up on the sidewalk, the team selected the equipment likely to be needed, and proceeded to the apartment. When arriving there, the line crew physician briefed the cardiologist who then took over. While his assistants were setting up the portable laboratory and the EKG machine he interviewed the patient concerning her medical history and present illness. He then carried

out a physical examination. Blood was drawn for a white cell count, and the feldsher recorded an EKG. The patient had two principal complaints, one relating to vertigo and the other to chest pain. She was given medicine for relief of her symptoms, the intravenous and intramuscular medication being administered by the feldsher. The EKG was analyzed in detail and recorded on a specially printed EKG section of the clinical record form. The complete work-up was reported on a fill-in form in duplicate.

The physician's decision was not to hospitalize the patient but to refer her to her own polyclinic physician. For this purpose he left a copy of the completed clinical report with the patient's husband and instructed him to either take her to the polyclinic or to have her own polyclinic physician see her at home the following day. The crew then returned to the ambulance and called into the central station to see where they should go from there. As it turned out, they returned to the central station.

The entire trip was characterized by a note of unhurried and experienced orderliness which indicated a considerable degree of confidence gained from practice by this team—even to the point of the physician always repeating key phrases in his dictation or instruction, so that there was no question about the term used, or the dose of a drug.

Since specialized ambulances were introduced the cardiac crews have accumulated 56 patients who suffered clinical death and were resuscitated. This represents a 30% salvage rate of those patients with either ventricular fibrillation or cardiac standstill as documented by EKG. Twenty percent of these patients became long-term survivors. In other words, given 100 patients found for whom resuscitation efforts were initiated, 30 would be resuscitated and brought to the hospital. Six patients would become long-term survivors.

The work of the shock control ambulances and crews was described by Dr. Khudish, a surgeon who directs that service. There are three such ambulances, with a crew consisting of a physician, two feldshers, and one junior assistant. Two of the crews are located at the central station, and one at a substation in a section across the Dnieper. This obviates the problem of crossing the Dnieper bridge if a call should come in from that area.

The crews of these ambulances are trained in the principles and procedures of anesthesiology, and are equipped for administering anesthesia, artificial respiration, blood replacement, and plasma expansion

for fractures. Each shock ambulance carries an EKG machine, suction equipment, defibrillation equipment, apparatus for artificial respiration, fracture and traction gear, everything necessary for IV infusion intubation equipment, and a special kit for mass accidents.

The physicians of these teams receive 10 months of training, including anesthesiology. The most frequent types of call for these vehicles are traffic accidents and burns.

The structure and function of the neurological team and ambulance was described by Dr. S. B. Dolberg, the chief of that service. The physician of this team is either from the Institute of Neurosurgery or from the Department of Neurology of the Bogomolyetz Medical Institute. Again, the medical brigade consists of one physician, two feldshers, and one junior assistant.

This specialty ambulance service deals principally with strokes, epilepsy, and hypertensive crises. It, too, usually goes out on summons from an ordinary crew.

The ambulance is equipped for diagnostic work, including lumbar puncture; for the administration of antihypertensive drugs; and for the use of coagulant and anticoagulant therapy.

The team must decide where to hospitalize the patient, i.e., whether to take the patient to a neurosurgical service or to a regular hospital facility.

Tbilisi

In Tbilisi functions of the Neotzlozhnaya and the Skoraya are combined into a single system. Thus, for any kind of medical help at any time, a citizen dials 03. But, unfortunately, we did not visit the Skoraya in Tbilisi, even though the central station was located immediately adjacent to the Iveria Hotel where we stayed.

The population of Tbilisi, according to the 1970 census, is 888,000. It is served by a central station and six substations ("filials"). The Skoraya service consists of 70 medical teams (brigades) of which 17 are specialized into pediatric, cardiologic, gynecologic, shock, stomatologic, etc. More than 300 physicians of different specialties work in this system, and in 1968 serviced almost 300,000 calls.

The shock team has two physicians, a feldsher, and an orderly. Their ambulance is equipped for artificial respiration, anesthesia, defibrillation, transfusion, etc.

The four cardiologic teams consist of a physician, a laboratory technician, a feldsher technician trained to handle the complex equipment, and an orderly.

Children are served by the eight pediatric teams and there are three obstetric-gynecological teams.

The stomatologic team handles night calls for emergency oral and dental care. Urologic and neurologic teams were introduced in 1968.

There are departments of emergency surgery and medicine at the Tbilisi Institute for the Advanced Training of Physicians. A council of leading professors recommends what latest accomplishments of medical science should be introduced into practice. It also recommends what new methods of delivery of emergency care, new drugs, etc., should be used.

Discussion

The Soviet Skoraya has some remarkable features which should be noted by anyone concerned with the all-pervasive problems of trauma and sudden catastrophic illness.

1. The Skoraya is part of the Soviet health care system which provides emergency medical care along medical lines of control. Such an intricate and important public service is not entrusted to the Fire Department, Police Department, or any voluntary or proprietary agency.

2. The underlying principle is to bring the best in modern medical care to the victims of disaster rather than patients to the source of care.

3. Because the care is a medical responsibility, all ambulances are staffed by physicians who are specially trained for the various functions of the Skoraya.

4. Immediate physician attention is assured in the Skoraya system. This is important because much of modern medical care depends on approaches to diagnosis and therapy which come only within the competence of physicians. This is especially true in our progressively aging population who are particularly susceptible to sudden catastrophic illness.

5. With physicians available on every ambulance assistants can be trained to play a supportive role to render the emergency care process most efficient.

6. Physicians are available to decide whether to leave the patient at home or to return him home and remand him to his physician. That this happens in the majority of cases is an interesting phenomenon.

7. Because emergency care is coordinated with the health care system, patients can be disposed to appropriate health facilities without delay and with minimal error.

8. Integration of the system allows for backing up regular ambulance crews with specialized resources when need for such is required.

9. The Skoraya, because it is part of the medical care system, has become a medical service specialty, with its own scientific research base, its own organiza-

tional setup for personnel and equipment, its own educational requirements and opportunities, its own system of conferences, national and international assemblies, and its own medical literature.

10. As an extension of the medical care system, it actively collaborates service and research with other medical disciplines. Two striking examples are traumatology and resuscitation. The problems of cardiology and many other fields require immediate and elaborate attention, however.

11. The Skoraya, existing as an organized entity, allows other elements of the health care system to be developed in relation to it. For example, medical posts staffed by middle medical personnel can be maintained on every subway station because the Skoraya is instantly available.

Such a list of considerations can be extended, but basically, it is designed to and does provide adequate emergency medical care as an essential part of the health care system.

III. Sanitary Medical Services and Epidemiology

A part of the Soviet health care system which more nearly corresponds to the American concept of public health services is the Sanitary-Epidemiological Service of the National Ministry of Public Health and those of the Union republics. Two examples, by way of illustration, are the development of measures for controlling certain infectious diseases and measures for controlling the natural environment as man influences it and it in turn influences man.

During our visit to the Ministry, Dr. D. Pavlov discussed this part of the health system. Within the Ministry of Health there is a Board of Sanitary Medicine and Epidemiology of which he is chief. This Board has a number of divisions, and this structure is replicated throughout each of the republics of the Soviet Union. The basic operating unit of this department is the Sanitary Epidemiologic Station, commonly called the Sanepidstan or the SES. Complementing the SESs there is a network of health education stations, which are backed by 80 scientific and research institutes concerned with sanitary medicine and epidemiology. The total number of SESs throughout the country is 5,000.

Dr. Pavlov illustrated the Department's role by citing the universal problem of disposing industrial wastes with consequent soil, water, and air pollution (fig. 13).

This particular service is directed and operated by specially trained physicians called sanitary physicians. One of the major tracks in the medical educational establishment is devoted to this discipline, and 23 of the 71 medical institutes provide education for sanitary physicians. This is also an important area for feldshers. One of the main tracks in the middle medical schools is Specialty No. 1904, which produces the sanitarian-feldsher as distinguished from all other types of feldsher. Dr. Pavlov made the point that sanitary feldshers are most important in carrying through measures initiated by the sanitarian-physicians at the operational level.

A responsibility to the education of children is a major activity of the Department of Sanitary Medi-

cine. It is responsible for school hygiene and for the programs of school doctors and their assistants. The Department is also responsible for the SES sanitary and hygienic care of adolescents. This is a vast area of endeavor which also interests children in becoming health activists.

The Head Sanitary Epidemiological Station of the Republic of Georgia

This service coordinates sanitary and epidemiologic service throughout the Georgian Republic. Located in Tbilisi, it maintains relations with the Board of Sanitary Medicine and Epidemiology of the Ministry of Health in Moscow.

The three oblasts of the Georgian SSR are subdivided into rural and urban rayons, each of which has its own sanepidstantsia. The principal task of this organization is environmental sanitation dealing with water, air, and soil pollution. Its second major task is control of infectious disease.

Each SES, like the head SES, has three main departments: a laboratory concerned with chemical and bacteriological determinations; a sanitary department, which deals with epidemic control; and the disinfection service itself.

Recommendations from the Sanitary Epidemiologic Service are enforced by law. For example, at one town a metal plant was polluting the air. The Sanitary Epidemiologic Service recommended that electrostatic and cyclone filters be installed, and set a time limit of one year for this to be accomplished. It was. Another example is that every new project (building of a plant, factory, school, or any communal project) must be countersigned by the Sanitary Epidemiological Service. It is here that the specially educated sanitarian-physicians work, in school hygiene, food hygiene, industrial hygiene, etc. These doctors check out, approve, and follow through on all new projects to see that recommendations made by the Service are enforced.



—Now they can't say that we're smoking up the sky for nothing
 — Теперь не скажут, что мы даром небо коптим...

Drawing of Yu. Cherepanov
 Рисунок Ю. ЧЕРЕПАНОВА

Figure 13.

In addition to soil, air, and water pollution, there is great concern with conditions such as noise, vibration, and lighting, which may affect an employee's work adversely.

If a project does not meet the specifications set by the Sanitary Epidemiologic Service, a letter to the bank will cut off the supply of money and discontinue construction.

If there is disagreement between the project developers and the Sanitary Epidemiologic Service, for which local resolution cannot be attained, the issue moves up the line, and may in some cases go all the way to Moscow. A final decision must be made by the Deputy Minister in charge of sanitary epidemiological services for the USSR.

The Sanitary Epidemiological Service also samples city water supplies. All water works have their own labs, and sampling of water at this level is done on an hourly basis. The Service samples the water at different points in the system on a daily basis.

Concerning the fluoridation of the water supply, it was estimated that perhaps three to five more years will be needed to fluoridate all water supplies in the Soviet Union, as per the decision made in Moscow.

The Central Sanitary Epidemiological Station exercises a system to control all separate sub-laboratories throughout the Republic. It sends out control test specimens to check on the diagnostic accuracy of the sub-laboratories.

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IV. Health Manpower and Medical Education in the Soviet Union

In the Soviet Union medical workers are divided into three ranking levels: the highest are the physicians; the middle includes the feldshers, nurses, midwives, and technicians; and the lowest includes orderlies, maids and other support and maintenance personnel.

A. Middle Medical Education (Feldsher, Nurses, Midwives, Dentists, Pharmacists, Etc.)

There are 2,043,000 middle medical workers in the Soviet Union, and as mentioned previously the ratio of middle medical personnel to population in the Georgian Republic is 90 per 10,000 or one out of every 106 persons.

Middle medical personnel include different types of workers. They are educated in middle medical schools (technicians) for which the following courses are listed.

Specialty No.	Name	Duration of course
1901	—general feldsher	—2 years 6 months
1902	—midwife	—2 years 6 months
1904	—sanitarian feldsher	—2 years 6 months
1903	—feldsher laborant	—1 year 10 months
1905	—dental doctor	—2 years 10 months
1911	—nurse	—1 year 10 months
1909	—dental technician	—1 year 10 months
1906	—pharmacist	—1 year 10 months

To be admitted to the middle medical school courses with the above listed durations, a 10-year general educational background is required. Until recently, eight year general school graduates were accepted, especially from the rural areas, but the duration of medical school for these students was one year longer. Thus, a 17-year old graduate from the 10-year general school could be a member of the health manpower force by 18½ (for a nurse), or 19½ (for a general feldsher or midwife).

The concept of the middle medical school provides that all health care workers share a common responsibility and that different levels and categories of performance exist at which people work. Thus the administration and faculty are not made up of older and experienced feldshers, midwives and nurses. Rather they are made up of physicians who know what should be taught and how. There is no suggestion at any time that therefore either the feldshers or the nurses are independent health care professions. The profession is medicine and, consequently, all teaching, health care, and administrative components of the system are run directly by the doctors.

There is also a very important operative concept concerning the service role of the feldshers. They are not considered physician assistants or surrogate physicians except under very special circumstances. They do not work between doctors and nurses in the hospitals or polyclinics. On the contrary, they continue to play their historic role in rural areas where physicians are in short supply, and serve at "forward health stations" in the transport and shop system. As described in the section of the report on emergency medical care (the Skoraya), they also play a special role here in close collaboration with physicians.

B. Higher Medical Education (Physicians)

There are 645,000 physicians in the USSR presently, giving a ratio of 26.6 per 10,000 population, including stomatologists. The ideal ratio set by the Ministry of Health is 34 to 36 doctors for 10,000 (which is in fact the present ratio of the Georgian SSR).

Dr. Ivanov, assistant to the Chief of the Board of Medical Educational Establishments, discussed the higher educational system for physicians, and we had the opportunity to visit the Sechenov Institute in Moscow and the Kiev Medical Institute in the Ukrainian SSR.

Organization of Medical Schools

Medical education is provided in Medical Institutes which are primarily free-standing institutions unrelated to universities. In the past, medical faculties were part of universities but it was later considered more desirable to have them under the jurisdiction of the Ministries of Health rather than the Ministries of Education.

The Chief administrative officer is the Rector, appointed by the Ministry of Health of the Republic for an indefinite period. The Rector has four deputy rectors (prorectors) for teaching, research, clinical services, and administration. He is advised by a Council which includes the deputy rectors, deans of the various faculties in the institute, department chairmen, sometimes the associate professors, party organization members, students, and trade union representatives. The Council at the First Medical Institute in Moscow (Sechenov) totals 80. The Council meets monthly and decides on all major policy matters. In addition, there is an Executive Committee of the Council which includes the Rector, his deputies and deans, which acts between Council meetings.

The chairmen of the departments are elected for a period of five years by a Scientific Council made up of department chairmen. They are ordinarily reelected three to four times. A special Commission of the Council studies possible candidates and makes recommendations to the Council. The Council votes by secret ballot and rarely disagrees with the recommendations of the Commission. Although there is no formal retirement age, the Council tries not to elect chairmen after they have reached the age of 70.

There are five basic tracks in the medical institutes:

1. The medical faculty (*lechebnie*), which includes internal medicine, surgery, obstetrics, and gynecology;
2. The pediatric faculty;
3. The stomatologic faculty;
4. The sanitary medicine and social hygiene faculty (public health); and
5. The pharmacologic faculty.

Recently (about 1966), a medical-biologic track was added in some institutes for primary selection and development of research scientists.

Very few institutes (e.g., at Tbilisi, Kishinev, and Azerbaidzhan) contain all five faculties, but they may contain any number. A total of 11 institutes have four tracks and the majority have three or less.

The special track for pediatrics should be noted, in that its existence highlights the degree of autonomy of the pediatric health care system from the general

system. Students in this track are in no way concerned with adult medicine.

Until 1968 the curriculum lasted six years, at the end of which the new graduate was assigned to his first clinical post. Since 1968, however, a seventh year has been added. According to Dr. Ivanov, the first two years are didactic, and devoted to medical biologic subjects, i.e., the basic sciences. The next three years represent clinical training, and the sixth year is one of specialization. This means that in the medical track (*lechebnie*), for example, the student will be trained in internal medicine, surgery, or obstetrics and gynecology. This year of specialization represents a policy change in Soviet medical education which is about three years old. Similarly, since 1968, this policy toward more specialized training now demands that following graduation all students spend a year of *internatura*, which is also specialized. This seventh year is almost equivalent to the American "straight internship" or a "first year residency". Thus, the young internist (*terapeut*) receives two years of special education when he enters his work career.

The more specialized disciplines are developed after the *internatura*, and usually after a three-year period of work in an assigned post. Two systems exist for training of advanced specialists: the *ordinatura*, at the practical clinical level; and the *aspirantura*, which is academically oriented.

There are three levels of qualification for a specialist: The first is where the physician practices a specialty but without special educational qualifications for it; the second is where the physician has some qualification in the discipline; and the third is the first class specialist.

The First Moscow Medical Institute (Sechenov)

Although medical institutes vary in size and complexity, the First Medical Institute in Moscow (fig. 14), named for T. M. Sechenov, is an excellent model. The Institute has about 1200-1500 students entering each year and a total of 6000-8000 students. It has doubled in size since World War II. Three to four hundred students are considered the limit for one medical faculty and, if the size is increased, another faculty would probably be formed. The Sechenov has three tracks—two medical faculties, each with 300-400 entering students; a faculty of sanitary hygiene with 200 entering students; a faculty of pharmacy, with 300 entering students; and an evening faculty of pharmaceuticals, with 150 entering students. This institute has abolished evening courses for medical students.

The Institute, one of the largest in the country, has over 1,000 faculty members. There are the equivalent of 300 members in each of the two medical faculties—about one for every eight to ten students. Each faculty has its own main clinical departments, but some of the faculties in the specialty clinical areas are shared between the various schools thus having multiple teaching responsibilities. Single basic science departments are common to all faculties. They are administratively a part of the faculties.

The faculties of the Institute are divided among 70 departments. There are 27 departments in the First Medical Faculty. A department will ordinarily have one or two professors, one or two associate professors (docents) and five to 15 assistant professors.

Three of the departments at the Institute have associated Academy of Medical Science research institutes: therapeutics, obstetrics and gynecology and surgery. These departments show a comingling of faculty for teaching and research supported from the two sources. An individual who is director of the research institute may also be chairman of the department. Dr. Boris P. Petrovsky, who is the USSR Minister of Health, heads the Surgical Institute at the Sechenov.

The total budget for the First Medical Institute is 50 million rubles per year. The cost for educating a medical student, including instruction, equipment, administration, stipends, and student health costs, ex-

clusive of patient care costs and research, have been estimated at 1200 rubles per year per student. This same figure was quoted in other institutes and would appear to be a national average.

The Institute has its own outpatient clinics with 14 separate clinics and 2,315 beds. Other teaching hospitals in Moscow provide another 12,000 beds. Fifteen per cent of these beds are directly controlled by the clinical faculty of the Institute. There are a total of 300,000 hospital beds for a population of about eight million in Greater Moscow.

In accord with the reform in the medical school curriculum, specialization has been increased for all students (Table 2). The changes were introduced in some schools (such as the Sechenov) in 1967 and by 1973 all schools will have instituted the new program. In the first two years, the pre-clinical curriculum for all the tracks is identical, centering on the general biological and social-political education of the future physician. Students complete courses in anatomy, histology, biology, chemistry, physics, physiology, foreign language, and the social-economic disciplines—the history of the CPSU, political economy, and, in later courses, philosophy. They take examinations in these subjects. In the third year, the track begins to differentiate, and the student takes courses which combine the theoretical material of the first two years with the



Figure 14.—Moscow—At the Sechenov Medical Institute Prof. M. I. Kyzin, Dr. Steinfeld, Mr. Bobrov, Dr. Sbarkovsky, Dr. Roth.

subjects of practical medicine: pathologic anatomy, pathophysiology, microbiology, pharmacology, and introductory instruction in medicine and surgery. Partly in the third year, but basically in the fourth, fifth, and sixth years, the students of the therapeutic faculty receive their education in the basic clinical disciplines, internal medicine, surgery, anesthesiology, obstetrics and gynecology, pediatrics, hygiene, epidemiology, etc.

In the fourth year students rotate for one month on each service. They have one lecture a day on clinical

subjects and work in the wards for three to four hours in groups of six and seven. Each student has one bed assigned for the month, but he also studies, though to a lesser extent, the patients of other members of his group. Twice a week they have rounds with the professor and once a week a lecture on the clinical area they are assigned to. Their histories, physical examinations and progress notes on the patients are kept separate from the chart and do not become part of the official record.

Table 2.—Outline of Curriculum of Medical Institute (from V. V. Yermakov, "Vischee Meditsinskoe Obrazovanie v SSSR —Prospekt" (Higher Medical Education in the USSR—an Overview), Moscow, 1967)

STAGE I Years 1-2	STAGE II Years 2-3	STAGE III Years 4-6	STAGE IV Year 7
<i>Study of general educational and biological disciplines</i>	<i>Study of the medical-biological disciplines</i>	<i>Study of all clinical disciplines: hygiene disciplines (social hygiene, epidemiology, hygiene)</i>	<i>Internship in large hospitals (in internal medicine, surgery, obstetrics and gynecology)¹</i>
Social sciences (history of the CPSU, political economy, philosophy, scientific communism), foreign language and Latin	Practical training in the role of the nurse after the 6th semester—for 4 weeks	Practical training after the 8th semester in the polyclinic—for 4 weeks	
Physical Education	Anatomy		
Physics	Histology, with embryology and cytology	Practical experience in rayon hospitals after the 10th semester—for 5 weeks	
Biophysics	Biochemistry		
Chemistry (inorganic, organic, physical, colloidal)	Microbiology with urology		
Biology with genetics	Pharmacology	Specialization in the 6th year in medicine, surgery, obstetrics and gynecology	
Anatomy	Pathophysiology		
Physiology	Pathologic Anatomy		
	Introductory Course in Medicine, Surgery, and Roentgenology		

1. Each physician takes one year in one of the chosen disciplines.

The student receives essentially the same curriculum in the fifth year with more clinical responsibility. In the sixth year the student works in one of four departments and begins his specialization in surgery, therapeutics, or obstetrics and gynecology. In the sixth year the student's record becomes official when countersigned by a member of the faculty. At the end of the sixth year, which is called the "subordinatura", the student is given his certificate as a physician.

In the seventh year the student begins his internatura in a large oblast or city hospital. Those who were in surgery can further specialize in general surgery, ENT, ophthalmology, urology, orthopedics, or pediatric surgery. Those who follow the therapeutic path (internal medicine) can choose general internal medicine, psychiatry, neurology, dermatology, or tuberculosis, etc.

Those in obstetrics and gynecology and pediatrics continue broad training in their respective fields.

Advanced Medical Training and Continuing Medical Education.

At the end of the sixth year in the old plan, and at the end of the seventh year in the new, the student is assigned to a medical service institution for a period of three to five years where manpower is needed most. This period of his life is considered a special payment to society for his free medical education. The young doctor may be sent to far-away small communities to work. This period is critical to a young physician's life because his ability to pursue study in a specialized field of medicine or surgery will depend on the strength of the hospital or polyclinic to which he is assigned. When he has completed his obligatory first three years of service his future selection will have been conditioned.

In Russia, as in any country, areas of work are both desirable and undesirable and there is the usual proclivity of most physicians to work in the larger cities. These posts are available only on an openly advertised competitive basis so that qualifications and previous experience determine a physician's ability to attain a particular position.

Each medical school has "Scientific Student Societies" to which about one-third of the students belong. The Societies are autonomous but operate under the guidance and help of the faculty and administration of each department. The students elect their own officers and executive committee. One of the main functions of the societies is to provide an opportunity for the student to work in a research laboratory or in a clinic under the preceptorship of a faculty member. This work is in addition to the regular medical school program and must be done in the late afternoons, weekends, or evenings. There is the feeling that research is important to the education of medical students because of the increasing scientific content of medicine, even if the student intends a career solely in clinical service. Consequently, both at the Ministry and medical school level it is hoped to increase and expand this type of opportunity.

After the three years service, advanced clinical training for practitioners is available by four routes for those wishing to improve their qualifications in a particular field of medicine:

- a) **ORDINATURA:** Here the physician spends two years in specialty training in a large hospital. He works in various departments and has some formal instruction. He spends most of his time in the field of his specialty but rotates on

related services. During this time he has some considerable responsibility for patient care.

- b) **TRAINING IN ONE OF THE 13 INSTITUTES OF ADVANCED TRAINING FOR A PERIOD OF THREE TO FIVE MONTHS:** The training here is largely didactic and the physician does not have patient care responsibilities.
- c) **TRAINING IN ONE OF THE 17 FACULTIES OF ADVANCED TRAINING IN THE REGULAR MEDICAL INSTITUTES:** This training is similar to that under b) above.
- d) **PRECEPTORSHIP UNDER A SPECIALIST IN A LARGE HOSPITAL:** Very few choose this method.

Since the physician manpower problem has become less acute, the *ordinatura* has become dominant in preparing clinical specialists, and methods b) and c) above have received a greater role in continuing education.

Physicians in practice are permitted continuing education every three years if in a rural area and every five years if assigned to an urban area. Fifty-six thousand physicians took advanced training in 1969. They are not obligated by law to return for this training but the advantages of increased salaries and more attractive positions attract them to the courses. While they are absent from the medical institution to which they usually return, their families remain behind. However, extra compensation is provided to cover the costs of living.

Because of the difficulties when female physicians leave their families for three to five months, correspondence courses have been instituted. This permits the physician to attend the Institute for only two months. Shorter refresher courses by the Institute and Faculties for Advanced Training are also given for physicians in the large oblast hospitals.

Research Training

Students who wish to engage in a career in research or teaching enter the "*aspirantura*". The student usually returns to the *aspirantura* after his three to five year service period; however, unusually bright and promising students may begin their training immediately after their *internatura*. Those interested in careers in the basic medical sciences may begin their *aspirantura* after the sixth year certificate.

The number of aspirants is regulated by the All Soviet Union Council on Science and Technology based on recommendations made by the USSR Ministry of Health from plans submitted by the Republics. However, that is apparently a flexible program and

requests for more students than originally planned are routinely approved by the Republic Ministry. About 200 aspirants are supported by the Academy of Medical Sciences in their institutes. It was not possible to find out the number of aspirants in training this year, but in 1965 there were a reported 7,058 in training. This number has probably risen considerably since then.

A student is admitted to the aspirantura on the basis of an entrance examination which covers his area of interest, one foreign language, and political philosophy. The examinations, which are oral, are conducted by a committee of the Scientific Council of the Institute. The Council also selects the preceptor for the student, usually the chairman of a department or the director of a laboratory, and approves the study plan prepared by the preceptor and student during the first three months of his course. A student may have two preceptors, one of whom may be from another institution if the area bridges two disciplines. The student must take advanced courses, sometimes in a university. A special foreign language tutor is assigned for one year and ordinarily meets with the student twice a week for two hours a session. The student also has a course of lectures, seminars in selected subjects, and assigned reading in political philosophy.

At the end of the first year, the student takes a candidate exam, which covers the same topics as the entrance exam except that it is more advanced. The foreign language and philosophy examinations are written.

The student prepares and defends a thesis based on his research. The entire course usually requires three years. At the end of this period he receives a certificate as a Candidate in Medical Sciences. The student may then obtain a teaching post or continue research training for a period of five to seven years for the degree of Doctor of Medical Science. For this, he must prepare and defend another thesis.

In the past most Institutes provided evening studies for students who had finished secondary health profession schools which train feldshers, nurses, technicians, etc. These students studied at night for three years and finished the first two years of the medical curriculum. They then transferred to the regular day program to complete the work.

Some institutes have already abolished evening classes, and apparently this program is being phased out. Interestingly no credit is given for previous work as a health professional so that students are required to take the same courses as secondary school graduates.

Medical Students: Characteristics and Selection

Students usually enter medical school at age 17 after completing four years of primary school and six years of secondary school. Soviet law, however, allows students to enter medical institutes up to 35 years of age in order to provide upward mobility for those who have worked at lower levels in the health professions.

There are always more applicants to medical schools than places available for them. At the Semashko Institute we were told there were seven applicants per place. Students apply only to one medical school, and are selected almost entirely on the basis of the entrance examination. The examination covers chemistry, biology, physics, philosophy, and the Russian language. Exams are given from about August 1st to 20th of each year. Science examinations are oral and are conducted by two professors. A list of questions is prepared and available to the student in advance. Twenty to thirty students are scheduled for a given subject each day for the examining team. At the examination, the student draws a number which will indicate four of the questions he is to answer in a subject. He is given 15 minutes to answer the questions. Although the time seems short, faculty members advised us that the quality of the student is easy to determine within a minute or two after he begins to answer the questions.

A student who has received a gold or silver medal for outstanding achievement in secondary school is required to take only one of the science examinations. If he has an outstanding grade in the examination he is admitted. If a student does only satisfactory work, he must take all of the examinations. Other than this, high school records are used only to select students for admission to the entrance examinations.

Among those who have passed the entrance examinations, preference for selection is given to students who have worked for two years beyond secondary school—especially to those who have worked in health care establishments and those who have completed middle medical school training with gold or silver medals.

Although 75% of the present practicing physicians are women, the number of women now entering classes has been reduced. Present classes are about 40% women and 60% men. Many administrators and faculty members stated the ideal ratio would be 30% women and 70% men, since women have difficulty raising families while doing professional work.

Medical education is free, but stipends are given

students with high grades. Seventy percent of the students receive stipends during their medical education, the other 30% depending on family support. Basically, however, it was said there is no financial barrier to a student who wishes to study medicine. If a student comes from a low income family he is permitted to work during his medical course. They often work as nurses on night ambulance duty. The first year student receives 28 rubles per month which increases to 30 rubles in his sixth year. It is estimated it costs him about twice this to live. Students are rarely married

upon entering school, but about 20% are married by their sixth year, often to physicians.

The attrition rate is about 10%, particularly in the first and second years. Both students and faculty alike work together in deciding which students are better excluded from further participation. In cases where the student is doing poorly but under mitigating circumstances, he is allowed to continue. On the other hand, if a student is making satisfactory grades but has attitudinal problems, he can be recommended for exclusion.

V. Projections in Health Care

Projections for development of the Soviet health care system are indicated in the 5-year plan for 1971-1975. At the Ministry, Dr. V. V. Golovtsev, Chief of the Board of Planning and Finance, made the point that the Ministry of Health of the USSR is responsible for developing the 5-year plan but that annual plans reaching toward objectives of the five year plan are the responsibility of the individual republics. He talked to us at great length on the long range aspects of health care planning.

A brief part of the plan appears on page one of this report. The extract which follows is included to emphasize the point covered in our visit and to illustrate some of the needs of patient care and steps designed to meet them. Admittedly, to read this, one should understand the existing health care arrangements and attitudes toward what is important and what is not so important in deploying a nation's resources for health.

"...IMPROVEMENT IN SPECIALIZED MEDICAL CARE TO THE POPULATION, for which it is projected.

a) with the further organization in the cities of regional polyclinics to develop first line medical service to the population according to the following basic specialties: medicine, surgery, otolaryngology, ophthalmology and neurology, and also the opening in them of clinical-diagnostic laboratories, offices for EKG and for physiotherapy, therapeutic exercise and massage;

b) to have in a series of large-scale polyclinics of the big cities doctors of particular specialties, such as traumatology, orthopedics, endocrinology, urology, cardio-rheumatology, gastroenterology and others for provision of therapeutic and consultative service not only to the population of the region of service by this polyclinic, but also to the population of the entire city or part of it (a region). For rendering of consultative service provision is made for enlisting the cooperation of specialists of other institutions and also of the professorial-educational staff of the medical institutions of higher learning and the scientific research institution;

c) to broaden ambulatory surgical services to surgical, trauma, ENT and eye patients;

d) in cities and regions which do not have independent dispensaries, (oncologic, dermatovenereal, tuberculosis, anti-goitre, etc.) and where the conditions do not exist for their organization it is planned to develop a network of corresponding dispensary divisions (offices) in the polyclinics;

e) to organize at republic, krai, and oblast hospitals, and in the big cities—at one of the city hospitals, divisions (centers) for cardiac surgery, cardiology, vascular surgery, neuro-surgery, nephrology, chest disease, for the treatment of patients with myocardial infarction, burns, which will fulfill functions of inter-oblast and inter-republic significance;

f) to organize at city level (or rayon) large-scale centralized biochemical (for carrying out complicated tests which require special apparatus), bacteriologic, serologic, cytologic and histologic laboratories at the expense of unification of the small corresponding laboratories;

g) to develop a network of functional diagnostic offices;

h) in the interests of improving the quality of physiotherapy service, of more effective and complete utilization of expensive apparatus, shower, bath, mud and other equipment, and also of the specialty of physician-physiotherapists, to organize centralized city (regional) physiotherapy divisions in combination with therapeutic exercise and massage (at the expense of corresponding curtailment of the work volume of offices in individual polyclinics and redistribution of equipment);

i) to introduce more widely rehabilitative therapy by means of a combination of physiotherapy, therapeutic exercise, massage with work therapy and occupational-technical retraining of patients and invalids (creating for this purpose divisions of work therapy).

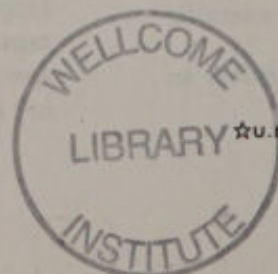
"...STRENGTHENING OF THE MATERIAL AND TECHNICAL BASE OF THE POLYCLINICS AND ACCOMPLISHMENT OF THEIR TECHNICAL RE-TOOLING WITH NEW MODERN APPARATUS AND EQUIPMENT. Improvement in transportation is projected for distant physicians and physicians of the narrower specialties for carrying out their work in providing service to patients at home..."

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