OTS: 60-11,532

JPRS: 2550

18 May 1960

VOYENNO-MEDITSINSKIY ZHURNAL
[Military Medical Journal]

7

1959

Distributed by:

OFFICE OF TECHNICAL SERVICES
U. S. DEPARTMENT OF COMMERCE
WASHINGTON 25, D. C.

~~Price: $3.00~~

U. S. JOINT PUBLICATIONS RESEARCH SERVICE
205 EAST 42nd STREET, SUITE 300
NEW YORK 17, N. Y.

JPRS: 2550

CSO: 1374-N/24

VOYENNO-MEDITSINSKIY ZHURNAL

[This is a full translation of the entire issue of Voyenno-Meditsinskiy Zhurnal [Military Medical Journal], No 7, 1959.]

TABLE OF CONTENTS

Page

CURRENT NEWS

For Further Rise in Inventive Work

Resolutions of the 21st Congress of the Communist Party of the Soviet Union have inspired the Soviet people to new labor achievements, have aroused in the entire country a wide wave of creative activity. The inexhaustible energy of the working masses, which is directed by the Party, insures a continuous and vigorous development of industry. New factories, mills, electric power stations grow up in our country; highly productive machines and mechanisms are created; new branches of science and technique receive wide development.

Unlimited possibilities in the Soviet Union are created for the creative development of science and technique, new discoveries and inventions. Soviet scientists, constructors and engineers bring in a worthy contribution to the construction of the Communist society. The whole world knows about successes of the Soviet science in the field of nuclear physics and atomic power engineering, jet-propulsion aviation and rocket technique.

The creation of the first artificial Earth satellites in our country, launching of the cosmic rocket, which became a first artificial planet of the Solar system, prove to be a strong indicator of the high industrial-technical level of development of the Soviet Union. These discoveries are an entire epoch in the development of scientific knowledge of humanity.

The Soviet people proceeded, with ardent patriotism, in carrying out problems of the Seven-Year Plan. The realization of this grandiose plan will be a deciding stage in the formation of the material-technical base of Communism in USSR.

The development of our country rests on the newest achievements of science and technique, on the ever-growing creative initiative and selfless toil of workers, kolkhozniks and intellectuals.

In the report of N. S. Khrushchev at the 21st Congress of the KPSS [Communist Party of the Soviet Union], it was pointed out that, in the matter of technical progress, an important role belongs to inventors and innovators. About ten millions of inventions and innovational suggestions were introduced, during the years 1950-1958, to national economy; they helped in development of technique, reduction of the cost of production and improvement of labor conditions for millions of workers. During the last three years the economy, which resulted from the introduction into production of these suggestions, comprised about 24 billion rubles.

Resolutions of the 21st Congress of KPSS open wide

possibilities for the development of medical industry. During the next seven years the output of various medical articles, medical instruments, devices and apparatus, including also the equipment for utilizing atomic energy for medical purposes, will increase sharply.

The wide use of automation and of electronics in many respects will determine the successes of development of military medical science and the level of the medical protection of troops. Such electronic apparatus and devices for physiological examinations, diagnosis and treatment of various diseases as vector-cardioscope for the spatial plotting of electrical processes in the heart, apparatus for a faster computation of formed elements of blood and many others are ever more utilized in medicine.

The inventive and innovational activity in the Soviet Army and Navy is of enormous importance for a constant improvement of technical equipping of the Medical Service.

Of late, the number of inventive and innovational suggestions, which comes from the personnel of the Medical Service, is being constantly increased. Thus, for instance, in Transcaucasian Military Command, in 1957, 96 suggestions were entered, while in 1958 -- 126; out of these, 115 suggestions were carried out in practice; in the Baltic Command, in 1957, 168 suggestions were received, and in 1958 -- 179, out of which 167 were realized. The inventive and innovational work was also revived at the Central Scientific-Research Experimental Institute of Military Medicine.

Inventors and innovators of Medical Service contributed valuable suggestions. Captain of Medical Service, Yu. N. Shanin, co-worker of the Military Medical Academy Order of Lenin imeni S. M. Kirov, invented an apparatus for automatic narcosis, while Captain of Medical Service V. N. Balyuzek -- an apparatus for artificial blood circulation and breathing. Co-workers of the Central Scientific-Research Experimental Institute of Military Medicine, Engineer-Colonel P. I. Riabov and an employee, O. K. Plekhmanova, suggested an automatic intake injector for the apparatus for "DDA" and "DDP," which considerably improved the construction of these facilities of military medical technique. Of great value was the suggestion of Yu. Yu. Keerig, Captain of Medical Service and an employee, S. A. Arlauskaite -- Military Hospital of the Baltic Command -- a rule for calculation of absolute numbers of the leukocytic formula.

There is yet much to do for a fuller and thorough technical equipping of the Medical Service of the Soviet Army and Navy.

The Chief Military Medical Administration has recom-

mended to the inventors and innovators a list of subjects for development in 1959-1960. This list, of course, is not exhaustive. Especially important are such divisions of our service as the improvement and mechanization of facilities for carrying out and removal of the wounded from the field of battle, mechanization of labor of caring for sick and wounded. It is also necessary to improve methods for caring for sick with the aim of lightening the physical labor of the attendants: organize transportation of the sick within the section, mechanize the serving of food and of medicine, cleaning of the buildings, and so on.

Inventive work in the field of equipment of medical establishments with better improved apparatus and instruments is very important. Much yet has to be done for the development of portable X-ray apparatus with electronic-optical units, which would permit to conduct tomography, angiocardiography, encephalography in statics and dynamics.

Modern surgery requires perfect apparatus for the narcosis, which would provide full safety of the narcosis for the sick and the wounded, and would be portable also, that is, useful for field conditions; it is also necessary to improve and supplement the sets of instruments and apparatus for military field surgery, to improve methods of plastic surgery, to utilize polymers for the needs of the military-medical service as much as possible.

The efforts of inventors and innovators in the field of aviation and navy medicine must be directed to the development of portable samples of apparatus and instruments for physiologic-hygienic research, for the formation of special installations for conducting prophylactic and medicinal measures among the personnel under different conditions of combat activity.

The inventive and innovational ideas must be directed for the development of new methods of research in the field of sanitary-hygienic and antiepidemic protection of troops. It is especially important to develop the quickest methods for determination of the infectiousness of objects in the surrounding environment.

Great creative efforts must be exerted also by workers of Medical Supply, directing their ideas to the development of more improved methods of preservation and distribution of medical-sanitary stores, of mechanization of loading-unloading works, of formation of the new and improvement of the existing pharmaceutical equipment, and so on.

Innovators and inventors must pay more attention to the mechanization of labor-consuming works at the bath-laundry establishments, helping in the improvement of labor conditions.

Great and serious problems are facing the inventors and the innovators. These problems will be successfully accomplished, if the innovators will direct their initiative to the solving of basic, daily requirements of the Service, but not the abstract subjects that are not connected with the life of the unit and of the ship; and if the leaders and organizers of the inventive work would mobilize the personnel for their solving, they will help the authors in their work, especially the beginners.

According to the acting regulation about the inventive and innovational work in the Soviet Army, the organization of this work is accomplished by the Commission of the unit, of the institution on inventiveness.

The Commission of Inventiveness must help the inventors, advise them, explain their mistakes, point out the current ways for solving the problems, render help in shaping the suggestion. In case the author has no means for the preparation of a model of his suggestion, the Commission is required to provide means for its preparation.

Professional unions, Young Communist League and Party organizations and political agencies, as well as the voluntary society of inventors and innovators of a unit, of an institution, using various forms of party-political and of mass-organizational work, must daily help in the creative work of the personnel, develop in them the desire for innovations, help the commanders and chiefs to organize correctly the work of inventors and of innovators; help in a quicker spreading of the leading experience, develop a closer collaboration of scientific workers with practical workers, of engineering-technical personnel with the medical staff.

It is a great honor to be an inventor and an innovator. The duty of all the personnel of the Military Medical Service consists in the exerting of inventiveness and initiative for helping a constant improvement of methods of medical-prophylactic, sanitary-hygienic and antiepidemic protection of soldiers of the Soviet Army and Navy.

From an Experiment on the Organization of Inventive and Innovational Work

I. G. Vinogradov, Colonel of the Medical Service,
Candidate of Medical Science

A Commission on Development of Inventions and of Innovations was organized in 1954 for the purpose of raising the inventive and streamlining work in the medical service of the district; for a timely guidance of ideas of inventors and innovators, and for the generalization of their experience; it was attached to the Office of the Chief of Military Medical Section. The Commission was composed of: Deputy Chief of the Section (Chairman), Chief Specialists of the District, as well as Senior Officers of certain sections. Commissions on Development of Inventions and of Innovations were also formed in medical establishments of the district; their general supervision was carried out by the Chief of Section. In units, formations and teaching departments of the district, as a rule, medical workers became members of the Commission on Development of Inventions and of Innovations. The Commissions on Development of Inventions and of Innovations organize studies of subjects of "GVMU" [Supreme Military Medical Administration] on innovations, discuss the current problems and compile subject suggestions and recommendations to the inventors and innovators. In the plan of work of the Commission problems are specified, which must be solved during a given length of time. For instance, consideration of innovational suggestions, exchange of experience among the innovators, organization and conducting of displays of the best suggestions of innovators and inventors. The Commission of Military Medical Section of the district plans the inspection of the Commission's work on the Development of Inventions and of Innovations in medical establishments; the preparation and the conducting of the district inspection of the best innovational suggestions as well as the conducting of the District Conference for Innovators and Inventors.

The Commission mentioned that certain garrisons sharply reduced sending innovational suggestions. The Chairman of the Commission addressed the Conference of the Medical Staff of these garrisons with an analysis of the innovational work and of the problems of Medical Service on these questions. Similar appearances of the Commission members and of the Chief of Military Medical Section of the District were carried out also in other garrisons. Such a measure helped in the stirring up of the innovational work,

Results of the innovators' and inventors' work are summed up at the Annual Conferences of Innovators and Inventors; also, new problems on its development in the units, formations and medical establishments of the district. Conferences are held also in units, formations and medical establishments. The participants of the Conference both show their achievements for solving various problems, as well as mention the defects which hinder them in better carrying out the innovational work. Exhibitions of the best innovational suggestions are organized before the beginning of the Conference of Inventors and Innovators. One member of the Commission on Development of Inventions and of Innovations is appointed to be responsible for the display of the Medical Service. Besides that, in order to popularize the innovators, we attracted, of late, individual authors also to the work at the exhibition.

Organization of a district exhibition of the best streamlining suggestions is practiced in troops also. In 1955, such an exhibition was organized directly in the district camp, and in it took part both the Conference delegates, as well as the personnel of the units. We presented the best innovational suggestions at the exhibition that was organized at the Military Medical Museum of MO [Ministry of Defense].

The leaflets of technical information, which we print for the circulation of recommended innovational and inventive suggestions, are very popular in our district. The best suggestions are being introduced into practice, and this is helped, to a large degree, by the issued leaflets of technical information. Such suggestions as modification of the system for blood transfusion and blood substituting liquids (Z. R. Shavrina), a small table for stability during operations of an arm (F. M. Bakulin), a chamber for testing X-ray tubes and kenotrons (G. A. Orlov), a general-purpose splint for those wounded in the spine and head (A. N. Gerasimov), the simplest packing for the intake of test samples of air, soil water, food in foci of infection (A. P. Beliaev), and many others found a wide application in medical establishments of the district. The chiefs of medical establishments and commanding officers of the district troops recommend the authors of best suggestions for promotion. The best organizers of the innovational work are commended in the orders along with the innovators. Officers Kornilov, Shpetnyi, Nikiporov and others, were commended in the orders of the Army Commander as well as of the Chief of Administrative Services.

Certain of the inventors and of the innovators labor

searching for new medical apparatus, instruments and graphic training appliances, which exceed the bounds of district interests in their importance. Thus, A. I. Matushkin, Major of the Medical Service, works on a "teleorganovisor," which, according to the intention of the author, can be successfully used for diagnostic and medicinal purposes; Colonel of the Medical Service, I. A. Aizman has invented a raspatory, which facilitates a lung operation. Colonel of Medical Service, A. T. Baranov, suggested a combined training model PMP, which is successfully used in the practice of training the personnel of the Medical Service of the district.

The creative research of our inventors and innovators is widening with every year, and their number is increasing. The number of inventors and innovators increased by 1.5 times in 1958, as compared with the year 1954; inflow of innovational suggestions -- by two times, while the number of suggestions that were carried out -- by three times.

A cooperative activity of the personnel of medical establishments and of the personnel of Medical Service of Army troops proved to be the condition for successful innovational work. We are facing the problem of establishing a sizable and constant connection between the medical workers of medical establishments and of military units. The Educational Methodical Council, in the Office of the Chief of Military Medical Section, could play a big role in the increase of innovational work, but, unfortunately, these problems were not yet even once put on its agenda at the meetings. Party organizations of medical establishments are not sufficiently engaged in the struggle for a wide development of inventions and innovations among their collectives, and the commissions and the chiefs of establishments do not lean strong enough on Party and Young Communist League organizations in the development of innovational work. Chiefs of medical establishments of military units and formations must conduct daily work for the widening of the collective of inventors and innovators, through Party and Young Communist League and trade-union organizations, in order to direct their creative ideas to the solving of problems facing the Medical Service.

In many cases, we do not yet actively help the inventors in the shaping of the streamlining suggestion, in the preparation of the model, and so on. It would be expedient in the future to practice systematically the announcement of a competition for the best invention and innovational suggestion.

The entire activity of Chiefs of the Medical Service units, formations and of the wide circle of inventors and innovators must be directed to the solving of actual problems of medical protection of military troops.

Principles and Organization of Medical Classification at the Regimental Medical Aid Station

G.P. Lobanov, Lieutenant Colonel of the Medical Service

The activity of the regimental medical aid station, in providing medical aid for battle operations under modern conditions, is distinguished by a great variety and complexity. The new conditions quite frequently give rise to changes in the volume of medical aid and the order of evacuation of the afflicted in the regimental medical aid station. (Everything which has been stated with respect to the afflicted applies to the same degree to the sick.) While during the period of the past war the extent of medical aid at the regimental medical aid station and the order of evacuation of the wounded did not undergo any considerable changes and the need for correct and precise medical classification was generally accepted, under modern conditions this situation assumes special importance.

Certain principles of medical classification are characteristic of every stage of medical evacuation, which is manifested first of all in a quite constant, typical grouping of the afflicted in accordance with certain signs.

Grouping of the afflicted and of the sick is the result of medical classification. For the purpose of giving a basis to the principles of medical classification at the regimental medical aid station we must direct our attention to problems for which this stage of medical evacuation is responsible. The entire activity of the regimental medical aid station proceeds along three lines: the detection of persons among the afflicted who constitute a danger to those around with the aim of isolating them and carrying out any possible therapeutic-prophylactic measures; giving medical aid to the afflicted; providing further evacuation for the afflicted. Evidently, the medical classification should be accomplished based on this entire activity of the regimental medical aid station.

We should like to dwell on the groping of afflicted persons. Under conditions where a considerable number of afflicted persons arrive at stages of medical evacuation who have been affected by radioactive and poison gas substances, bacterial toxins and microbial mixtures, as well as patients with infectious diseases, the isolation of such groups is of great importance. This is associated with two principles: with the danger of these groups to those around and the possibility of aggravation of the existing affliction because of the effect of the substances mentioned on the body.

The group of those afflicted who constitute a danger to those around is not homogeneous. From the therapeutic-evacuation and from the anti-epidemic point of view the following need to be distinguished in it: the afflicted who need to have measures taken for the removal of radioactive or poison gas agents as well as bacterial toxins from their bodies, equipment and uniforms; those patients afflicted by microbial mixtures and patients with infectious diseases who need not only the measures indicated but also should be isolated.

If the necessary therapeutic-prophylactic measures for the afflicted included in the last group are taken, as a rule, in a specially designated place where they are sent to, such an order quite frequently proves to be inacceptable for the afflicted persons of the first group. As a matter of fact in a certain part of those afflicted, who are affected by radioactive substances, war gases and bacterial toxins measures for the removal of the latter cannot be taken before medical aid is given, because this is associated with great risk to life (severe shock, coma, collapse, marked convulsions, acute bronchospasm, pulmonary edema, asphyxia, continuing hemorrhage, etc.). In connection with the absence of conditions for carrying out medical measures in the Department of Special Treatment, such afflicted persons should be sent directly to the functional unit of the regimental medical aid station where the necessary medical aid can be given to them.

Therefore, in the classification of the afflicted persons who constitute a danger to those around it is necessary to separate out those affected by radioactive substances, war gases and bacterial toxins for whom measures for the removal of these substances can be carried out before medical aid is given; those affected by radioactive substances, war gases or bacterial toxins in whom measures for the removal of these substances cannot be accomplished before medical aid is given; the afflicted and the sick who need isolation.

Based on their need for medical aid those afflicted are divided into the following groups at the regimental medical aid station: those who need medical aid, which should be given at the regimental medical aid station; those who need aid which can be postponed and given at the subsequent stages of medical evacuation, or those who do not need aid at all at the regimental medical aid station; those patients who are agonal, who need only nursing care and alleviation of their suffering.

The composition of the first and second groups can

undergo substantial changes depending on specific conditions. Thus, when a full volume of medical aid is given at the regimental medical aid station the first group should include all those who need medical first aid. If the need arises for reducing the volume of medical aid, part of those afflicted who need medical first aid should beput into the second group. However, under any conditions those who need medical aid at the regimental medical aid station should be divided according to the consideration of afflicted persons who do not need first aid and those who need emergency medical care.

Medical aid can be given to those afflicted in the first group on the spot where the need for it has been determined. Classification post, classification yard, ward in the receiving-classification department or in the aid station. In connection with this, the afflicted persons who under these conditions should receive medical care at the regimental medical aid station should be subdivided further according to the place at which it is to be given. Among them afflicted persons are isolated who need to be sent to the aid station; afflicted persons to whom medical aid can be given in the receiving-classification department. Among those afflicted who need to be sent to the aid station the order in which they are sent needs to be established. First of all, those who need emergency medical care should be sent to this functional unit; all the others should come afterwards.

Under modern conditions the organization of evacuation of the afflicted from the regimental medical aid station can be different. Along with the sending of them in a single line to the next stage of medical evacuation, which was typical of the past war, other variants are possible: transportation evacuation of a greater or lesser portion of the persons afflicted, i.e., further transportation by the same vehicle on which they were brought to the regimental medical aid station; the sending of the afflicted persons to several medical evacuation stages which render specialized medical aid; the sending of the slightly wounded directly to the Field Hospital for Treatment of the Slightly Wounded (GLR); limitation or complete stoppage of evacuation in the event that the facilities for rendering specialized medical care used for the reception of the afflicted have been moved forward from the regimental medical aid station to the battle area.

Quite frequently the existing order of evacuation of the afflicted persons has to be changed during the course of operation of the regimental medical aid station. This requires the elaboration of such principles of medical classi-

fication that will exclude "reclassification" of the afflicted persons when the order of evacuation is changed. In addition, they should assure the most rapid possible evacuation of those needing emergency specialized medical care. The grouping presented above, according to which all those who need evacuation are divided into three groups, satisfies the requirements mentioned: of those needing evacuation the afflicted persons who require emergency specialized medical care are evacuated first; the severely wounded and moderately wounded who do not need emergency specialized medical care are evacuated second; the slightly wounded are evacuated third.

It should be supposed that in a number of cases, for example, when classification is carried out at the regimental medical aid station by a physician and where a vehicle is available, it will be expedient to evacuate the last group of afflicted persons directly to the GLR. Actually, if at these stages of evacuation, which are designed for rendering specialized medical care, only those who need emergency measure can obtain this type of care, as a rule, why send all the afflicted persons there, it may be asked.

The division of the afflicted persons into three groups not only determines the order of transportation of the evacuees but also indicates the method of evacuation and the most expedient type of transportation which should be used for it. Naturally, those afflicted in the first group should be evacuated in a lying position in the gentlest and fastest means of transportation (ambulances or airplanes or helicopters adapted for transporting the afflicted). A slightly afflicted person may be transported in a sitting position in all-purpose trucks. Only with respect to persons in the second group does the need arise for additional grouping according to the method of transportation of them (lying, sitting).

Part of those afflicted who arrive at the regimental medical aid station will not need to be evacuated to the rear. These will be the persons who, by virtue of the slightness of the existing affliction (or disease) have not lost the ability to carry out their service duties and can be returned to their units or who need very brief treatment at the regimental medical aid station.

In concluding the analysis of the principles of medical classification, it should be noted that the classification represents a single continuous process. Thus, the physician at the medical classification unit solves the problems of the need for medical care, the place and the order in which it is given practically simultaneously. For example, an af-

flicted person who is considered not to need medical care at the regimental medical aid station is immediately referred to one group or another which has been isolated for purposes of providing further evacuation.

This principle does not in any degree repudiate the principles of medical classification presented. On the other hand, such an order becomes possible only with the knowledge and profound understanding of the essence of its principles. However, this is only one side of the matter. Another, no less important aspect consists of the need for carrying out the accepted principles of medical classification under the specific conditions. This problem is solved by proper organization of medical classification. Theorganization of medical classification includes a number of measures; the principal ones are the following: determination of the number and qualification of personnel which needs to be brought in for carrying out the classification as well as the correct dislocation of this personnel; the isolation of a special place for medical classification of those afflicted persons arriving at the regimental medical aid station and the appropriate equipping of it; the establishment of sequence in the medical classification and the determination of the problem of classification of the afflicted persons at various functional units.

The organization of medical classification at the regimental medical aid station is determined not only by the staff possibilities of the regimental medical aid station, which are practically constant, but also in large measure by the order of receiving the afflicted persons, giving them medical aid and evacuating them further which is in force at the given moment. Thereby, the principal variants of the organization of the work of the regimental medical aid station should be considered to be the following: the reception of all those afflicted persons who arrive and the rendering of the necessary first aid to them; the reception of all afflicted persons who arrive but the rendering of medical aid only according to the emergency indication; (in these variants the accepted order of evacuation of the afflicted persons does not exert any essential influence on the organization of medical classification); the reception of only a part of the afflicted persons to arrive needing emergency first aid measures and of terminal patients, and the evacuation of all the others by transport to the subsequent stages of medical evacuation.

The receiving-classification department of the regimental medical aid station, as a rule, includes a classification post (SP) in its composition, a classification yard

and a ward (or wards) or some other rooms. In the first of these variants mentioned, the afflicted persons who constitute a danger to those around are isolated at the SP. The vehicle which arrives stops immediately in front of the SP. The sanitation instructor or the aid man separates those who are able to walk spontaneously out of the group of afflicted persons who arrive. Medical classification of such afflicted persons should be accomplished immediately after they come out of the truck or upon their arrival at the SP by foot. If this is not done, part of the afflicted persons may spontaneously arrive at various functional units, which, undoubtedly, disorganizes the entire work of a regimental medical aid station. Following classification of the afflicted persons who are able to walk independently persons who remain in the trucks are classified.

The isolation of those afflicted persons who constituted danger to those around is based on data obtained by means of questioning and examination of them. While those affected by radioactive agents can be determined quite simply according to the results of dosimetry, indirect signs are needed for the detection of thos affected by war gases and bacterial agents: traces of the war gases on uniforms and equipment; the fact of wearing individual antichemical protection facilities. It should be considered that those affected by war gases and bacterial agents can be isolated successfully only when the persons who are carrying out the classification have timely information about the use of these agents in units involved by them. However, even in this case a medical reconnaissance group is sometimes required, for the purpose of calling which to the SP a prearranged signal should be established.

Afflicted persons who constitute a danger to those around are designated by appropriate classification tags and are sent from the SP either to the isolation ward or to the special processing department; all the others are sent to the classification yard. Persons who are able to walk by themselves should go on foot; the others, as a rule, in the same truck in which they were brought to the regimental medical aid station.

Medical classification of the SP is complicated considerably when there is a mass influx of afflicted persons and where there is a need for reducing the volume of medical aid. In this case, the afflicted persons who do not constitute a danger to those around should be further subdivided into slightly afflicted and severely afflicted. Such a grouping is of an auxiliary nature because it does not define the specific operations for rendering medical aid to them

and evacuating them.

Persons who can walk independently should be classified in a group of slightly afflicted when they do not have any external bleeding, injuries of the internal organs, eyes, humerus, shoulder joint, extensive injuries of the upper extremities or any symptoms or signs in accordance with which the afflicted person should be of necessity examined by a physician at the regimental medical aid station. For the purpose of diagnosing the characteristics which make it possible to effect the grouping mentioned at the SP there should be a feldsher working in addition to the sanitation instructor or aide man.

The slightly wounded are sent from the SP immediately to the evacuation department, and the seriously afflicted, a part of whom will need emergency medical care, are sent to the classification yard (see Fig.).

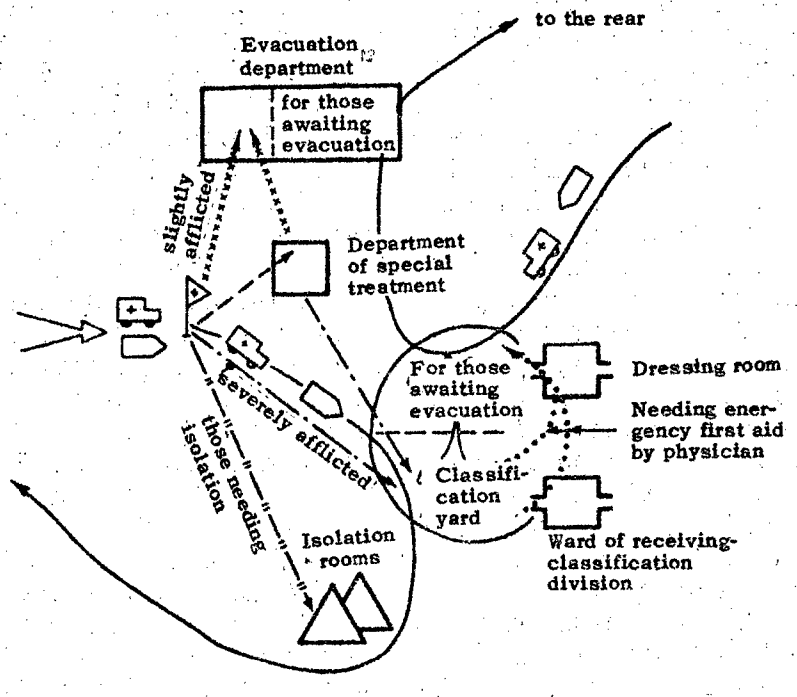


Diagram of Movement of the Afflicted and Sick at the Regimental Medical Aid Station at a Time When Only Emergency Medical Care Has Been Given in It.

When "transportation" evacuation is used the medical classification at the SP is even more complicated. In this case, a physician, two feldshers (or sanitation instructors) and two or three aid men-litter bearer units work at the

SP. When the truck arrivds the physician quickly detects those who need emergency medical care, terminal cases, those who need simple therapeutic measures, the accomplishment of which will enable them to continue their evacuation by transport (injections, adjustment of dressings, immobilization, etc.) among those afflicted. The aid men bring those afflicted in the first two groups to the ward of the receiving-classification department or immediately to the dressing room. With respect to the afflicted persons of the last group the physician gives instructions to the feldsher or to the sanitation instructor concerning medical aid to be given directly in the truck.

When a receiving-classification department is set up organization of the classification yard should be provided as a necessity. By a classification yard is understood a section of the locality directly adjacent to the ward of the receiving-classification department; it is adapted for receiving, distributing and classification of the afflicted persons and for giving them medical aid of which it is capable. Depending on the organizational conditions, the work in the classification yard can be modified substantially. In hot dry weather it constitutes the principal place where medical classification is accomplished for those afflicted persons received at the regimental medical aid station. In this case it is expedient to organize the work in the yard in the following way. At the time the afflicted are taken off the truck the physician makes a cursory examination of those who arrive with the aim of detecting persons among them who need emergency care and sends them to the ward of the receiving-classification department or immediately to the dressing room. All the other afflicted persons are arranged in the following order in the yard: the litter patients in rows, leaving spaces between the litters and between the rows, and the ambulatory patients (if they are not sent from the SP immediately to an evacuation department) are kept apart from the litter patients. New arrivals are arranged behind those who are already in the classification yard or in a separate row, but in any case not among those afflicted persons who have already undergone classification. Application of the "principle" "if there is a free space use it" leads to complete disorganization of the work.

Along with the cursory examination of the new arrivals the physician makes a more detailed examination of the afflicted persons who are in the yard and a more detailed classification of them. During the course of classification the afflicted persons are divided into groups according to their needs for medical care as well as according to the place and

the order in which it is to be given. The afflicted persons who have received medical care directly in the classification yard as well as those who do not need any care at the regimental medical aid station (including persons for whom the rendering of medical aid is postponed to the next stage of evacuation) are grouped for further evacuation.

It should be emphasized that little patients designed for evacuation should not, in the majority of cases, be transferred to the evacuation department; they are arranged separately in the classification yard and they are loaded into trucks here.

Experience has shown that two feldshers (or sanitation instructors), one aid man, as well as (from the group of slightly afflicted) two clerks and two or three litter-bearer units should work along with the physician. In this case the physician, examining the afflicted person, dictates the necessary data to the clerk, who enters them into the medical record book, and gives instructions to the feldsher or sanitation instructor concerning the necessary medical measures to be taken. Then the physician procedes with the next afflicted person using the other feldsher and clerk. In the time which is spent in examining a single afflicted person, the personnel left at the preceding patient concludes the rendering of medical aid to him and precedes with the third afflicted person along with the physician, etc. Such a "leapfrog" order of work gives good results.

In cold or damp weather as well as in the dark this organization of receiving and classification of the afflicted in the classification yard will be impossible. Under these conditions, the main place for medical classification should be the ward (or wards, or other rooms) of the receiving-classification department. Here, the majority of principles dealing with the organization of classification of the afflicted in the classification yard remain in force. At the same time, certain characteristics of it should be noted. If there are several wards (rooms) for the distribution of the severely wounded they are filled in turn; when the afflicted persons are arranged in several tiers the most severely wounded, as a rule, occupy the middle tier; persons who are unconscious, having convulsions or with marked dyspeptic signs (vomiting, diarrhea), who are expediently placed at the bottom, constitute an exception. The slightly afflicted are arranged in a separate ward (or room) or separate places are set apart for them; afflicted persons who need to be sent to the dressing room are concentrated as much as possible in a separate place.

Medical classification in the dressing rooms of the

Medical classification in the dressing room of the regimental medical aid station consists mainly in a distribution of the afflicted who arrive there into groups for the purpose of their further evacuation.

The organization of medical classification in the evacuation department can be modified depending upon the existing order of reception of the afflicted persons at the regimental medical aid station. Thus, before those who arrive pass through the receiving-classification department, its role is reduced practically to the realization of the conclusions reached above.

A completely different principle applies when the slightly afflicted are admitted to the evacuation department directly from the SP, by-passing the receiving-classification department. In this case, the evacuation department actually becomes the receiving-classification department for the slightly afflicted (see diagram). Here, just as in the receiving-classification department, medical classification can be accomplished in a specially furnished yard or in wards (or rooms). At the place of entrance to the department an area is outfitted for medical classification and for rendering aid. Here should be a table with a supply of the necessary medicinal and prophylactic facilities, syringes, bandaging material and splints. The feldsher examines those who arrive, separates out the group of afflicted who need first aid and aid before being seen by a physician, and this is rendered on the spot. At the same time, the afflicted are grouped for purposes of establishing the proper order of evacuation of them.

Persons who are to be evacuated are separated from the afflicted persons who have not been classified and who are awaiting medical care. Otherwise, the entire work of the department suffers considerably. Experience available at the present time causes us to believe that in this case a sanitation instructor or aid man as well as two or three of the slightly afflicted persons from the group of those left for treatment at the regimental medical aid station should work along with the feldsher.

We examined the organization of medical classification under conditions where the regimental medical aid station was set up beforehand. However, with the occurrence of foci (or areas) of mass casualties the regimental medical aid station quite often will have to be moved closer to them and be set up at the place where there is a greater or lesser accumulation of afflicted persons. Under such circumstances the proper beginning of the work represents the guarantee of its successful accomplishment. In this connection, it is

expedient to give separate recommendations. On arriving at the deployment area, the chief of the regimental medical aid station should establish the approximate number of the afflicted persons there and where the litter patients are chiefly located. The classification yard is organized at the place where there is the greatest accumulation of litter patients; those afflicted who have maintained their ability to walk independently, are immediately directed to the evacuation department; during this trip they are examined by a physician so as to detect those who need emergency medical care among them or those who need more attentive examination.

In summarizing everything which has been said, two facts should be emphasized. The first of them consists in the fact that diagnosis of the affliction underlies the majority of medical classification principles. Based on this, the physician conducting the classification should be not only a good organizer but should have also clinical training which permits him to analyze exceedingly complex afflictions from modern types of weapons rapidly and correctly.

The second principle concerns consolidation of medical classification. The results of classification are most effectively consolidated with the use of colored numbered classification tags. There should be a set of classification tags at the regimental medical aid station making it possible to designate the following groups of afflicted persons: those needing special processing, those subject to isolation, those to be sent to the dressing room first and second, those to be left at the regimental medical aid station (including terminal cases), those who are to be returned to their own units, as well as those to be evacuated first, second and third. The classification tags are most expediently attached to the uniforms (to a button) or hung on the litter handle, for which purpose they should be prepared beforehand.

The best results in the study of these principles of medical classification can be achieved in the course of medical field exercises or training with the setting up of a regimental medical aid station.

The Role of the Garrison Physician in the Organization and Administration of Specialized Training of Personnel

P. N. Kirillov, Colonel of the Medical Service

In recent years, the forms and methods of special medical troop personnel training have been developed further. Specifically, in addition to exercises accomplished in auditoriums and classrooms various types of training and regular practice of physicians in medical installations, etc. have become quite widespread. It would be possible to give quite a few examples confirming the activity and promise of the new forms and methods of training medical service personnel.

Among the complex and important tasks which need to be solved by the garrison physician, problems of organization of special training of the medical personnel of the units and installations which are territorially included under its jurisdiction, occupy an important place. The good results of this work in the garrison depend in large measure on its proper organization, thoughtful planning, the presence of a well equipped training base and the giving of exercises at a high training-methodological level.

One of the factors determining the quality of prophylactic and therapeutic-diagnostic work in the units and medical installations is the level of practical medical training of the medical personnel. The qualified and capable solution of problems of medical care of the troops under modern conditions is possible only on the basis of thorough specialized knowledge. Therefore, the training of medical personnel in such important qualities as the skill in creatively solving the problems of the theory and practice of military medicine should constitute an everyday concern of garrison physicians. These qualities are equally necessary for medical service organizers and for medical specialists in the medical installations.

The role of the garrison physician and the organization of special training assumes particular importance under these conditions where the units and installations included in the garrison are distinguished by great variety (units belonging to different types of troops, the presence of medical installations, teaching institutions, etc.). Under these conditions, in order to avoid any conflicts in the training of military physicians there is a distinct need for harmonious operation and centralized leadership.

It seems to us that the concentration of medical personnel training in the hands of the garrison physician creates better opportunities for utilizing the specialized per-

sonnel (military and civilian) for performing exercises, administering training bases, presenting clinical material, visual training aids, administering the medical library, showing special movies, etc. The garrison physician organizes special training of the medical personnel of the garrison and assures its practical accomplishment, being guided by organizational and methodological instructions of the higher staffs and also by the proposed thematics plan of exercises for the training year; in the organizational respect this measure is regulated by official documents which come from the chief of the garrison (plans, directives, orders, etc.).

An important basic element in the organization of special training is its planning. Here the composition of training groups, the volume and the content of training material, the method of carrying out the sessions, time given to the topics being worked on, personnel and facilities used for this purpose and the training bases to be set apart for this purpose are all taken into consideration.

The training groups are formed in a differentiated manner, taking into consideration the dislocation of the units and garrison installations, the specific characteristics and the type of work of the medical personnel and the level of their training. The number and the composition of the training groups in each individual case are determined depending on the category of medical service personnel, the specific local conditions, and are presented in a directive of the garrison chief.

In selecting methods of carrying out the exercises practical and seminar sessions deserve attention, that is, those methodological forms which actively assist in the assimilation of the material being studied. Experience has shown that the most acceptable organizational form of the exercises, particularly in a troop unit, are refresher courses for the medical service personnel. They are usually given under the direction of the garrison physician in training groups with consideration of the category of medical personnel twice a year -- in the winter and summer training period with subsequent tests given to the students of the groups. In planning the exercises and planning the sessions the garrison physician plans for the working out of the majority of training programs during the winter period of training, that is, before the garrison units go out to camp.

The physicians of the garrison units gain much that is useful at refresher courses given by the directing staff of the medical service and at the garrison scientific practical conferences: here, an analysis is usually made of the

most important divisions of therapeutic-prophylactic service of the troops, the state of scientific research work and special training of the medical staff. The presence of representatives of command and of the party-political apparatus at the refresher courses and conferences increases the significance of the problems being discussed and makes it possible to solve a number of important medical service problems in conjunction with the command.

Naturally, the training process cannot be strictly limited to the existing programs. In addition to the program topics proposed, the garrison physician can include, in addition, what appears to be interesting from the point of view of regional pathology, clinical aspects and prophylaxis of diseases with natural foci which are distributed in the billeting area of the given garrison and also beyond its limits.

The medical service of the troops and medical installations of the garrisons are every year being equipped to a progressively greater extent with the latest medical technical equipment and modern medical preparations. The problem consists in knowing to perfection the types of medical equipment which come into supply and being able to utilize them practically under hospital and field circumstances.

The duty of garrison physicians is to assure the serious study of the equipment with which they are entrusted by the entire medical staff of the garrisons and to make sure that their utilization and maintenance are organized in an economical fashion.

The giving of specialized lectures on a garrison-wide scale on general medical problems deserves attention. The garrison physician can do much that is useful in the organization of studying and of bringing the main principles of rules and regulations of the Soviet army to the personnel of the garrison medical service and assuring his personal control over their accomplishment.

Under conditions where the garrison units are in a dispersed position it is not always possible to centralize the special training of the medical staff. In such cases it is expedient to organize the training of physicians of various units, giving individual tasks and establishing the times for working on them and subsequent checking by the garrison physician. In addition, under the given circumstances the unit physician can be given quite considerable aid by specialists of medical installations on their trips to the troop units. The garrison physician should pose the problem of carrying out special sessions (talks) with the medical staff of remote units to the specialists who arrive

at the unit.

Among the troops an important place is given over to the training of medical personnel under field conditions. The organizing role of garrison physicians in this important type of training is extremely essential. It is known that the quality of the exercises depends on careful preparation for it, on the materiel of medical aid stations and installations, their personnel, transportation, etc. The garrison physician can have an active influence on the state of the medical units who are to go out for training. By means of an appropriate arrangement of medical personnel and facilities of the garrison it is possible to form and man medical service units capable of operating during the period of training.

The experience of field exercises has shown that this type of training can be instructive when the medical units are actively included in the work: imitation commands are picked out, problems of classification are carefully worked on, problems of organization of medical care, etc. Review is an important concluding phase of the training. In the review an analysis is made of the work of the stages of medical evacuation and in consideration of the experience offered by the training specific future problems are given to the medical staff. It is expedient to bring in more of the medical staff of the garrison as well as supply officers to the training.

Great opportunities are offered in the army for specialization and improvement of their knowledge by troop physicians at the bases of various military medical installations. The garrison physician plays an essential part in the realization of this measure. Knowing the work qualities and possibilities of the unit physicians he can be of aid to the higher medical service organizations in their selection for training of candidates taken from the group of subordinate unit physicians and medical installations who show promise of growth in the service.

Medical (hospital) practice occupies an important place in the system of special training of the medical staff. The usefulness and necessity of this measure do not need any clarification. However, it should be noted that this type of trainig is being conducted with inadequate completeness and inadequate consistency. Not uncommonly, various unit physicians attempt to circumvent the necessary sequence in taking medical practice according to established courses.

It is impossible to be satisfied with the whims of chiefs of certain medical installations who replace hospital practice with narrow specialization. Permission for

narrow specialization should be granted only in individual cases, known to chiefs of military districts, fleets and troop groups, when, by virtue of the remote location of the garrison from medical installations, the need arises for having physicians trained in work in the narrow specialties in the units. During his time in practice in a medical installation the troop physician should devote his main attention to therapeutic-diagnostic and prophylactic problems, that is, to everything necessary for the organization of capable medical-diagnostic and prophylactic work under troop unit conditions.

The garrison physician can do a great deal in improving the hospital practice of troop physicians if he will delve into all the intricacies of organization of this measure under conditions of medical installations. In the solution of this problem substantial assistance is provided by improving the methodollgical training of directors of medical practice and the selection of the appropriate group of patients which are intersting from the point of view of military pathology (burns, traumata and others).

Tours of duty in medical installations of the garrison have a beneficial influence in increasing specialized knowledge and in perfecting practical habits. The efficacy of this measure depends a great deal on the unit physicians themselves and on their attitudes toward tours of duty. The organizational aspect of this problem is decided and controlled by chiefs of medical installations and garrison physicians.

In connection with the increasing requirements for the medical training of troop personnel the garrison physician is confronted with important tasks for training exercise leaders from the group of medical service officers. Usually, the training level of the medical staff of troop units is different. Specifically, young physicians do not possess adequate methodological habits for conducting the exercises in the units. This circumstance cannot help but attract the attention of the garrison physician. For purposes of improving the methodological training of young physicians it is recommended that instruction-methodological and illustrative sessions be held regularly with them on every routine topic of medical training.

We should like to discuss briefly the utilization of specialized medical literature and of the training films. It is known that all of medical literature cannot be brought to the unit physicians. Therefore, the garrison physician takes measures so that by means of abstracts the latest data of Soviet and foreign military medicine can be brought to

medical service officers.

The quality of the sessions can be improved considerably if they are conducted with the showing of training films. The latter should be ordered beforehand by the garrison physician through the film-release bases of military district, fleets and troop groups and they should be timed with the sessions being given.

Everyday work requires skill on the part of the unit physician in properly evaluating the objective circumstances which influence the battle training of the troops and the living conditions of the unit personnel. The garrison physician, as the senior comrade and an experienced medical chief, can assist with his advice and with his deeds, particularly with respect to young military physicians, in solving problems confronting medical personnel. Not uncommonly, the garrison physician will have to give aid, because of his position in the service, in the organization of on-the-job training sessions for students in the senior classes of the military medical colleges and in giving refresher courses for physicians in the garrison. All these measures require considerable, painstaking work and many-sided training of the garrison physician.

Purposeful specialized training of the medical staff of the garrison units exerts a considerable influence on the successful solution of therapeutic-prophylactic care of the troops, improving medical knowledge and ability in work and the readiness to carry out specialized tasks under battle conditions. Problems of special training of the medical staff in various garrisons can be solved successfully only through the close collaboration of all the medical service units with the garrison physician.

The role of the garrison physician in the organization and accomplishment of special training is assuming progressively greater significance.

Special Training of Garrison Physicians

P. I. Andryushin, Colonel of the Medical Service

The troop medical service is confronted by great problems with regard to the future perfection of the organization of therapuetic-prophylactic and anti-epidemic care of the troops in peace time and particularly of its readiness for operation under field conditions. The accomplishment of these responsible tasks is unthinkable without the persistent and systematic work of the entire medical service personnel of the troop units in improving their special theoretical knowledge and their everyday practical habits.

During recent years, troop physicians have been provided with all thenecessary organizational opportunities, making it possible to put their special training in smooth operating order and to accomplish it in a more purposeful manner. Every garrison physician and hospital chief, who are chiefly responsible for the proper organization and quality of special training of troop physicians in the garrisons, is obliged to utilize these possibilities.

In organizing special training in our garrison, we attempted first of all to make it purposeful, to achieve a state in which the trainining and clinical practice of troop physicians might aid in improving medical service to the unit personnel, in avoiding errors committed sometimes by troop physicians when rendering emergency medical care as well as providing the physician with the preparation for coping with his own problems under strenuous circumstances at the time of a mass influx of afflicted and sick persons.

We ascribe the greatest importance to the perfection of practical habits of troop physicians in the main medical specialties -- internal medicine and surgery. For the purpose of successful accomplishment of this problem we have achieved the more effective utilization of field hospitals, polyclinics, experienced scientific teaching personnel, special chairs and institutions available in the garrison.

Medical practice of physicians in medical installations occupies one of the principal places in the special training system. In the garrison all the troop physicians take medical practice in an organized fashion and systematically throughout the entire year and have tours of duty in the hospital. The time of taking medical practice is planned beforehand by the garrison physician. After a preliminary consent from the unit commanders a general graph is constructed for the entire garrison, and before beginning the training year it is shown to each commander and the unit

physician. As a rule, the attachment to a hospital is for one month continuously during the year, and less often for two weeks twice a year.

The majority of physicians take medical practice in the garrison hospital. The medical practice instructors are usually picked out by the department chiefs. The work of the unit physician in thehospital is organized according to an individual plan in the construction of which the department chief (or instructor) takes a large part. In constructing the plan of operation the department chief every time considers the level of training of the physician as well as the results of his medical practice in preceding years.

The following is provided primarily in the individual plans: training the physicians to diagnose and render specialized medical care in the acute internal medical diseases, in being able to diagnose acute surgical diseases, in mastering the methods of giving aid to the burned and injured patients, in studying the differential diagnosis of infectious diseases. With this aim in view the unit physicians independently manage patients during their time of taking medical practice, write out their case histories, and accomplish the established procedures. Under the direction of treating hospital physicians pleural taps, intravenous infusions are performed and laboratory tests made. During work in the operating room they participate in preparing patients for operative procedures, assist in and not uncommonly perform simple operations independently.

The ability to render aid in the case of bone fractures and to apply all types of splints in practice are obligatory requirements of all troop physicians in our garrison when they take medical practice sessions.

Medial practice in the narrow specialties has not been organized for the majority of troop physicians in the garrison, it will be provided in the next few years. However, taking into consideration the working conditions of various units such practice has been permitted for certain physicians.

In the garrison great attention is being given to the organization of hospital tours of duty by the troop physicians. These tours of duty are planned in the garrison twice a month throughout the year. During the tours of duty the physicians work actively as assistants to the hospital physician on duty. They receive and order for patients, examine them and render the necessary emergency care, perform the requisite laboratory tests, fluoroscopy of the chest, and participate in emergency operations. They also are present

in ward rounds and attend the hospital conferences.

During their tours of duty and medical practice physicians make extensive use of the medical literature of the hospital library as well as a special library created for troop physicians on tours of duty in the recreation room of the hospital. After concluding his tour of duty each physician writes down the principal work that he has accomplished during the day in his diary.

The initial results of medical practice taken by the majority of troop physicians for a third time have reflected positively on their work in the unit. There are many physicians in the garrison whose practical habits have improved notably during the time that they have taken medical practice and whose medical work in the unit has also improved considerably. A considerable improvement in medical work following hospital practice has been shown by troop physicians Lt. Col. of the Medical Service A. S. Saarkisyan, Lt. Col. of the Medical Service V. N. Blinovskiy, Lt. Col. of the Medical Service F. M. Sklyanskiy, Capt. of the Medical Service N. P. Vinogradov and many others. In their infirmaries the group of patients who would formerly have been sent to the hospital has increased; they do not permit any defects in sending patients to the hospital. They have organized a good system for rendering first aid. There are many such examples in the garrison.

Because of the constant contact of troop physicians with the hospital a closer association has developed with hospital physicians which contributes to an improvement in the work of the troop medical service. Joint service conferences which the garrison physician attends systematically serve this purpose; the results of medical practice are presented at the conferences; defects in the work of individual physicians are analyzed as well as shortcomings in the work of the hospital.

An important place is given over to special theoretical training in the garrison. With this aim in view the physicians occupy themselves in a program of battle and special training twice a month on definite days and hours. On the days indicated the chief specialist of the district, hospital physicians, workers in the sanitary epidemiological station, and in the OKUOMS [Military District Courses for Advanced Training of Medical Officers] give lectures and conduct seminars and practical exercises. At the exercises special scientific-methodological and popular scientific movie films are shown.

All the troop physicians of the garrison go out on field exercises every year in which the setting up and oper-

ation of medical units under field conditions are shown. In addition, the senior physicians of the unit participate every year in district refresher training courses. The garrison physicians participate in all the military medical scientific conferences held by the chief of the medical department of the district and by the garrison hospitals. Lectures are organized periodically for them on the medical problems of greatest current importance, and these are given by eminent scientists and directors of scientific research institutes. The unit physicians are also involved in scientific work. Thus, recently a group of troop physicians has participated in scientific work, which was presented at the hospital conference, along with physicians of the garrison hospital.

Far from all the possibilities have been utilized in the organization of special training in our garrison, however. Scientific research institutes as well as the most experienced teaching personnel of special chairs have been brought into this work to an inadequate extent. It is suggested that the garrison polyclinic, where all the possibilities exist for this, be used more extensively for medical practice of physicians, particularly in specialties of ear nose and throat, eye and skin-venereal diseases. Up to the present time there are still individual commanders who interfere with the trainig of their unit physicians, giving as a reason for this the fact that their physicians are occupied in taking care of the personnel.

The military medical department and the main district specialists constantly render considerable aid to the garrison in the organization of special training of its unit physicians.

Chen-Tsu Therapy -- The Oldest Method of Reflex Therapy in Chinese Popular Medicine

R. M. Broun, Lieutenant Colonel of the Medical Service

One of the widespread methods of treatment in China which has passed through a many-centuried history in Chinese medicine, has obtained public recognition and maintained its importance up to the present time, is Chen-tsu therapy -- treatment by acupuncture and cauterization.

In an ancient classic medical work Su Wen (2,000 years before our era) reported on the use of treatment with cauterization by means of dried grass and punctures made with stone needles. In the fourth to third century B.C. metal needles replaced the stone needles, and wormwood (Arthemisia moxa) became the ordinary tool for cauterization.

During the Ch'in dynasty (264-588) treatment with punctures developed into a special branch of medicine, and the emperors of the T'ang dynasty (618-907) designated a special category of physicians -- puncturers. By that time more than 200 works had been written on Chen-tsu therapy supplied with appropriate illustrations, and in the earliest of them more than 600 different points on the human body were described in detail in which the punctures were to be made. Later, the interrelationship was studied of the various points, and they were combined into 14 separate systems.

During the period of the Sung dynasty (1023) the physician Wang Wei-i created a copper mannikin on which the points and divisions of the vascular system known at that time were inscribed, and a special "Atlas of the Points of the Copper Man" was published.

The puncture treatment, which has given very good results and justified itself through long years of clinical experience, won the full confidence of the Chinese people. However, during the period of the past Ching dynasty and during the years of the Ho Min Dan regime this method was repudiated as being unscientific and charlatinistic, and acupuncture physicians were persecuted.

In 1944, Mao Ts'e-tung called on physicians of the modern school to collaborate with representatives of popular medicine and to study the methods of Chen-tsu therapy in order to improve its therapeutic effect. After this, in the liberated regions of the country treatment with acupuncture and cauterization again became widespread. In 1949, after the entire territory of China was freed and the existence of the People's Republic was proclaimed, the Institute of Chen-tsu therapy was organized, and in 1956, the Central Scien-

tific Research Institute, in which the Institute of Chen-tsu Therapy was included as one of its component institutes. The functions of systematization and generalization of the previous experience of acupuncture and cauterization and the study of Chen-tsu therapy by means of scientific methods was entrusted to this Institute. The director of the Institute is an eminent specialist in popular medicine and, at the same time, a doctor of medicine in the modern school -- Professor Chu Lien -- who has been able during the several years of operation of the Institute to create a serious scientific group with the broad participation of well-known representatives of popular medicine from various provinces of China. Professor Chu Lien is the author of a textbook well known in China, "The Most Recent Knowledge of Chen-Tsu Therapy," which has been published in four editions. This textbook is at the present time being translated into Russian.

In 1955, the third session of the Soviet-Chinese Commission on Scientific-Technical Collaboration, in consideration of the ever-increasing cultural relationship between China and the USSR and the great interest of the Soviet medical public in Chinese popular medicine and, particularly, in Chen-tsu therapy as well as the need for coordinating the efforts in scientifically grounding this method of treatment, has approved the study of Chen-tsu therapy by Soviet specialists including E. D. Tykochinskaya (leader of the group) and N. N. Osipova and M. K. Usova, Candidates of Medical Sciences, was sent to Pekin by the Ministry of Health USSR. The Soviet specialists have successfully solved the problems with which they were confronted. On their return to the Soviet Union the first clinical-experimental laboratory of acupuncture in the USSR was organized in the spring of 1957 at the Leningrad Neuropsychiatric Institute imeni Bekhterev headed by Professor E. D. Tykochinskaya, under whose leadership we have also obtained the opportunity of studying the theoretical basis and technique of application of Chen-tsu therapy.

In the fall of that year a second clinical-experimental laboratory of acupuncture was created, headed by N. I. Grashchenkov.

Of what does the method of Chen-tsu therapy consist in its main outlines? The method of acupuncture and cauterization is essentially one of the oldest methods of reflex therapy. This method has a number of distinct physiologic and therapeutic characteristics which distinguish it from other methods of reflex and, particularly, physical therapy. The Chinese name of the method, Chen-tsu, comes from the

words "Chen" meaning puncture and "tsu" -- cauterization.

The "Chen" procedure consists in pricking strictly defined points ("vital points") with a metal needle (steel, silver, gold), which are located on the surface of the body and in the depth of the tissues, with the aim of producing a mechanical stimulation.

Cauterization, "tsu," is based on the use of heat which is formed during the burning of certain substances, mainly wormwood, with the aim of thermal stimulation of certain points of the body.

In carrying out Chen-tsu therapy three factors are of decisive importance -- "the three main links" of the Chinese popular physicians: the topography of the points (site of puncture or cauterization), the nature of the stimulus inflicted with regard to its intensity and duration and, finally, the original functional state of the patient.

The knowledge of the "vital points" ("kon-hsiu") and the topography of them and of the site of effect of the stimulus is the most important factor in Chen-tsu therapy. In all, at the present time, according to the data of Chu Lien, there are 693 points with 371 names, of which 22 names designate the most important points; 12, the more important ones; 54, the important ones -- a total of 88 names (about 150 points); the other points are of secondary significance and are utilized comparatively rarely.

All the points are divided according to areas: points on the head, neck chest, abdomen, back, upper and lower extremities. Each area, in its turn, is divided by several lines (for example, the midline, first, second lateral lines of the chest) or into several parts, for example, eye, nose, ear. The Chinese popular physicians have two methods available for the precise determination of the localization of a point: first -- the method of individual measurement; second -- the method of proportionate measurement.

In the method of individual measurement use is made of the individual measure of length, in the capacity of which the "ts'un" unit is used -- the distance between the folds of skin on the flexed second phalanx of the middle finger, whereby according to the old concepts this distance on the middle finger of the left hand served as the unit of measurement in men and on the right hand in women, because, in the opinion of the popular physicians, the length of the phalanges of both hands was different, namely, the phalanges were usually longer on the left hand.

The method of proportionate measurement consists in dividing a certain portion of the body into a certain number of parts; the length of each of them is specific for a given

person. Thus, for example, the forearm is divided into 12 parts from the wrist to the elbow joint; the arm, into nine parts from the armpit to the elbow joint; the thigh, into 13 parts from the level of the pubis to the level of the knee-cap, etc. The numbers into which definite parts of the body are divided have been established empirically on the basis of a thousand years of experience; however, these data are very exact, which once again convinces us of the great power of observation of Chinese popular physicians. The knowledge of both methods facilitates the precise determination of the location of the points, which is decisive in Chen-tsu therapy.

The second most important factor or "main link" in Chen-tsu therapy is the nature of the stimulus inflicted, its intensity and duration. According to the nature of the stimulus and the aim of the effect produced "excitatory" and "inhibitory" methods of Chen-tsu therapy are distinguished. Strong brief stimulation (without leaving the needle in or leaving the needle in no more than three to five minutes) of the most sensitive points with the occurrence, largely, of a definite pain sensation underlies the "excitatory" method. This method is indicated in shock, collapse, loss of consciousness, flaccid paralysis, decrease or loss of sensory or motor function of the peripheral nerves, reduction in tone of the peripheral blood vessels.

The "inhibitory" method consists in the application of an intense, gradually increasing, prolonged stimulus (leaving the needle in 15-30 minutes, sometimes up to several hours, rarely up to 24-48 hours) which produces a distinct sensation of rheumatic pain, heaviness, numbness, "electric current" which radiates a great distance from the site of the puncture. The "inhibitory" method is used when there is increased excitability of the motor, sensory and secretory apparatus (pains, spasms, diarrhea, convulsions, etc).

In the opinion of Chu Lien, a reflex influence on the central nervous system, through the medium of which the processes which occur in the body are regulated, underlies the effect of both methods. This also explains the therapeutic effect of Chen-tsu therapy in a number of diseases. E. D. Tykochinskaya, G. Fol'bort, A. Podshibyakin and others adhere to the same opinion.

The so-called "predicted sensations" of the Chinese authors deserve special attention not only from a clinical but also from a theoretical point of view; these have obtained their name because the acupuncture physician knows beforehand what the patient will feel from being punctured by various methods in a given point. These sensations essen-

tially represent a response reaction to stimulation of various elements of the nervous system.

Let us dwell briefly on the method and technique of introducing the needles and of cauterization. This group of problems applies directly to the second "main link" of Chen-tsu therapy, because without knowledge of the method and a well developed technique the physician cannot, so to speak, dosage the intensity of the applied stimulus and, by the same token, obtain the necessary therapeutic effect.

The method of Chen-tsu therapy has been worked out with scrupulous accuracy over the many centuries of its application. In the old Chinese literature there is the statement: "the needle should be taken as cautiously as if one were approaching a tiger". To a certain degree this figurative expression maintains its significance even at the present time, because an improper method of acupuncture can bring only harm to the patient.

Three methods of introducing the needle exist: first -- the needles are introduced by slow rotary movements, whereby the needle is held with three fingers -- the thumb, index finger and middle finger; the second method consists of a rapid, superficial puncture which is accomplished with a short fine needle, holding it like a penholder; and third, a rapid puncture with subsequent rotation.

After the needle has been introduced to a definite depth for the given point the method provides for a number of subsequent manipulations. These constitute a search for the "vital point" itself, that is, the site of application of the stimulus, the infliction of the stimulus itself by means of rotating the needle at the site or puncturing until the "predicted sensations" occur, and then leaving the needle in for a more or less prolonged period with periodic repetition of the stimulus or without it and, finally, extraction of the needle, which in its turn can be accomplished in two ways: by slight rotary movements (so-called "constant extraction") and with a rapid vibration of the needle.

In teaching the method much attention has been given to measures for maintaining the needles in the tissues which are sometimes used in practical work in the presence of muscular rigidity or when the needle is enveloped by interstitial fluid. In these cases measures are taken sequentially such as leaving the needles in for a certain time until the muscles relax, tapping around the site of injection of the needle with the fingers, pressure on the surrounding tissues with the fingers, advancement of the needle somewhat deeper with subsequent extraction, puncture alongside the "vital point".

The method of "cauterizstion," like that of acupuncture, has been worked out by Chinese popular physicians very carefully. It should be pointed out however, that the term "cauterization" is not completely fortunate, although it is the literal translation of the Chinese work "tsu," because at the present time the method does not provide for true cauterization and only heating of the tissue with the end of a smoldering wormwood cigarette is carried out at one or several points at a distance of up to 1.6 cm. from the skin surface.

Tsu, in its turn, is accomplished by three methods. The first is a thermal effect (stable) where the burning end of the wormwood cigarette is brought close to a definite point on the skin until the patient feels a pleasant heat sensation in the surrounding tissues. Thereby, the cigarette is held firm. The second method is a pecking cauterization, whereby the end of the burning cigarette is continuously raised and lowered at a distance very close to the skin. On bringing the cigarette close to the skin the patient feels a burning heat, but no pain. The third method is heating with constant movement (ironing). In connection with the fact that the smoldering end of the cigarette is in continuous movement with this method the very close approximation of the cigarette to the surface of the skin does not cause any burn. While the first and third methods, in the opinion of Chu Lien, exert an inhibitory effect and are used in cases of neuroses of the gastrointestinal tract, eczema dermatitides, the second method, pecking cauterization, acts in an excitatory manner and is indicated for syncope, collapse, shock, and atonic constipation.

Finally, the third "main link" of Chen-tsu therapy is an evaluation of the original functional state on the background of which the treatment of the patient has been begun with acupuncture and cauterization. Chinese popular medicine in all of its divisions gives considerable attention to this problem. In the 18-volume book "Huang-ti Nei-ching" (third century before Christ) which is a canon of Chinese medicine it is mentioned as one of the main postulates of the process of diagnosing the patient: "the physician should remember that a disease is changeable; therefore, observation should be carefully made for all changes in the patient's condition."

Certain modern statistical data concerning the results of application of Chen-tsu therapy in the treatment of a number of diseases speak for the very favorable therapeutic effect of this method. Thus, according to the data of the Pekin Scientific Research Institute of Chen-Tsu Therapy, in which about 8,000 patients with 213 different nosologic entities have been treated, good results have been obtained

in 199 diseases. In 90 percent of the cases a therapeutic effect was obtained in the following diseases: neurasthenia, chronic rheumatic arthritis, facial nerve paralysis, sciatica, chronic gastritis, chronic bronchitis, hypertensive disease, bronchial asthma, menorrhagia, oligomenorrhea and many others. Chen-tsu therapy has been used, and not without success, in the treatment of the residual signs of poliomyelitis in children.

The efficacy of application of Chen-tsu therapy in the treatment of a number of diseases, according to the data of Chinese physicians, is indubitable. The data of A. P. Kassatkina and Z. M. Bryantseva as well as themodest experience in the use of this method in Soviet practice for almost one and a half years served as confirmation of this. (A. P. Kasatkina and Z. M. Bryantseva "Experience in the Use of Acupuncture in Certain Diseases of the Nervous System." "Zhurnal nevropatologii i psikhiatrii imeni S. Korsakova" [Journal of Neuropathology and Psychiatry imeni S. Korsakov], Volume VIII, No 10, Moscow, 1958). While still in the process of studying this method, acquainting ourselves with the available Soviet and foreign literature, and observing patients treated with acupuncture and cauterization in the laboratory of Professor E. D. Tykochinskaya, we had the idea that Chen-tsu therapy is a method the use of which may be of particular significance for the military medical service. The absence of this method "as armamentarium," so to speak, of the military medical service deprives military physicians of certain, at times quite definite, therapeutic possibilities for the therapy of a number of diseases the specific importance of which is considerable in the practice of both hospital work and work of troop physicians. Among such frequently encountered diseases, in the treatment of which it is expedient to use Chen-tsu therapy, are the following, as has been provided for in "Provisional Methodological Instructions for the Use of the Method of Acupuncture and Cauterization" of the Ministry of Health USSR: hypertensive disease stage I; chronic gastritides with a pronounced pain syndrome; peptic ulcer; vasomotor allergic conditions (hives, vasomotor rhinitis, bronchial asthma); diseases of the peripheral nervous system (radiculitides, neuralgias, plexitides, neuritides of different etiologies) and other diseases.

Even this far from complete list of diseases in which more or less beneficial results have been noted in the tremendous collection of material of Chinese physicians and in the still small number of observations in the Soviet Union cause us to consider the broader acquaintance of military physicians with Chen-tsu therapy. This is particularly ex-

pedient since the method mentioned is relatively simple and the use of it can serve as definite help in the therapy in a number of diseases which are frequently encountered in practical work (military physicians can use Chen-tsu therapy only after obtaining the appropriate special training and with the permission of the senior medical chief -- the editors).

Soviet military physicians have always played a great and positive part in the assimilation and incorporation of various methods and means of therapy into the practice of public health work. There is no doubt of the fact that Soviet military physicians will do their bit in the study and incorporation of the methods of the popular medicine of the Soviet Union's great friend -- the Chinese people -- into Soviet work.

General Purpose Blood-Vessel-Nerve-Suturing Apparatus

L. I. Kukushkin,
N. P. Petrova, Candidate of the Medical Sciences

Injury to the neurovascular bundle is a severe and dangerous type of injury. Therefore, one of the most important problems in surgery is the development of a simple and reliable method for connecting severed blood vessels and nerves. The successful development of restorative surgery depends on the solution of this problem.

In recent years, new methods, instruments and apparatus for joining blood vessels and nerves have been worked out, which contributes to rapid progress in surgery.

An apparatus for the mechanical suturing of blood vessels created by a group of Soviet engineers and physicians represents a great contribution to vascular surgery. It makes it possible to sew blood vessels together quickly, firmly and reliably. The essence of the method of suture application by means of the apparatus consists in joining the approximated blood vessel ends, with their intimas everted, with U-shaped metal, tantalum, clamps. The clamps, which are arranged the same distance from one another, provide the necessary stability and hermetic sealing of the suture.

An apparatus for the circular joining of blood vessels end-to-end has undergone a number of changes in design and simplifications during the course of perfecting it. Along with the perfection of the apparatus for applying a circular vascular end-to-end suture, an apparatus has been worked out on the same principle for applying an end-to-side vascular suture (the blood vessel of smaller diameter is sewn into the side of a larger vessel), as has also an apparatus for applying an epineural suture to nerves. The relationship between certain details made it possible to create a single general purpose blood vessel-nerve-suturing apparatus, which combines all three apparatuses mentioned above into a single design (Figs. 1, 2). (S. I. Sheynberg, L. I. Kukushkin, A. I. Burlakov, N. N. Kapitanov, P. I. Androsov, N. P. Petrova, T. V. Kalinina, L. I. Nagayeva, L. A. Potekhina, M. G. Kozina, N. V. Yurasova and others).

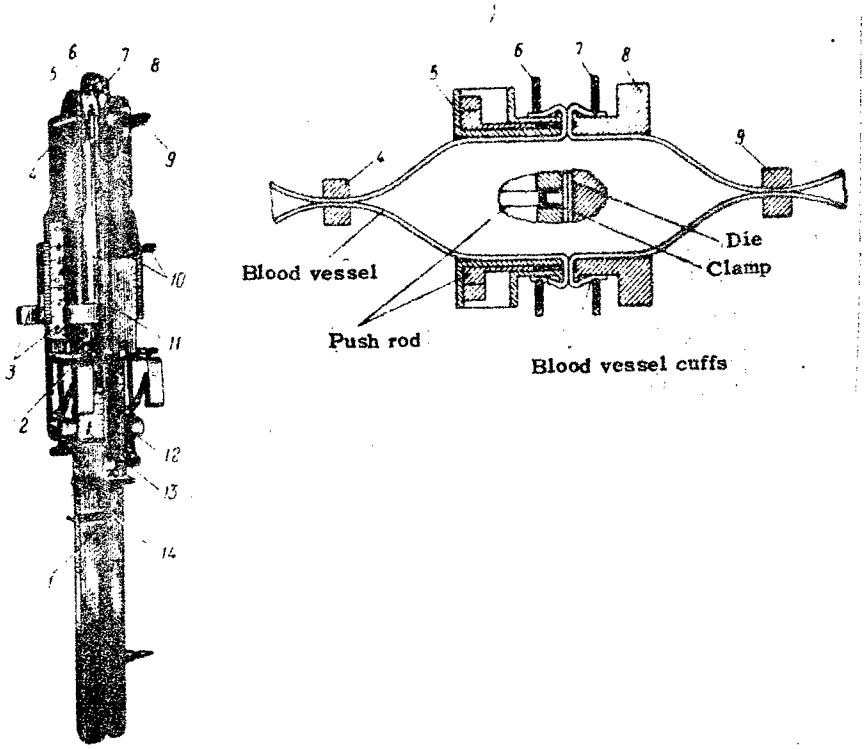


Fig. 1. General Purpose Blood-Vessel-Nerve-Suturing Apparatus Prepared for Suturing Blood Vessels End-To-End and Diagram of Applying Mechanical Suture:

1--body of clamper; 2--metal strip of clamper body; 3--levers; 4--hemostatic clamp (left); 5--clamper sleeve; 6--clamp-forceps (left); 7--clamp-forceps (right); 8--sleeve of stop; 9--hemostatic clamp (right); 10--catch; 11--metal strip of stop; 12--regulator bolt; 13--scale for regulating clearance; 14--body of stop

Blood vessels and nerves can be sutured by means of the general purpose apparatus in cases of different traumatic and gunshot injuries, restorative and reconstructive operations, aneuryysms, portal hypertension, and shunting of blood vessels. In addition, bile ducts, ureters and others can also be sutured with the apparatus. The general purpose apparatus makes it possible to apply circular sutures end-to-end on arteries and veins from 2.5 to eight millimeters in diameter; end-to-side, in veins from four to eight millimeters in diameter; and epineural suture, on nerves from 2.5 to five millimeters in diameter.

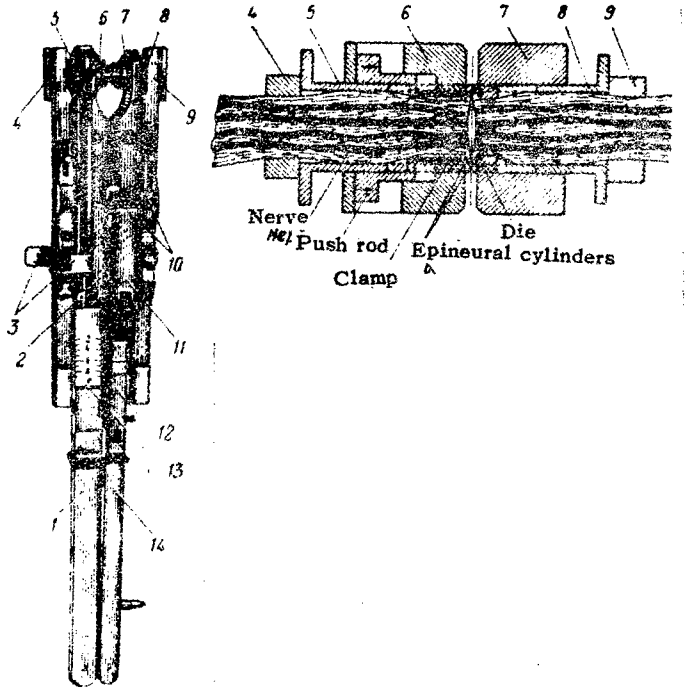


Fig. 2. General Purpose Blood-Vessel-Nerve-Suturing Apparatus Prepared for Suturing Nerve and Diagram of Application of the Mechanical Epineural Suture:

1--body of clamper; 2--metal strip of body of clamper; 3--levers; 4--nerve holder (left); 5--collar of clamper sleeve; 6--clamper sleeve; 7--sleeve of stop; 8--collar of stop sleeve; 9--nerve holder (right); 10--catch; 11--metal strips of body of stop; 12--regulator bolt; 13--scale for establishing degrees of clearance; 14--body of stop

The apparatus consists of two halves: a clamping half and a stop half. The principal working parts are detachable paired clamping sleeves (which contain slots into which the clamps are inserted) and stop sleeves (containing dies for bending the clamps). Each sleeve is divided into two half-sleeves. Suturing of the blood vessels and nerves of different diameters is accomplished by the detachable sleeves with different internal diameters. For the purpose of suturing blood vessels end-to-end there are seven pairs of detachable sleeves; end-to-side, six pairs; and for the application of epineural suture, five pairs of sleeves. Selection of the diameter of the sleeve and preparing the apparatus for operation depends on the size of the blood vessel or nerve being sutured. The blood vessels are joined with tantalum wire clamps 0.15 millimeter (150 μ)

in diameter; the nerves, by wire 0.1 millimeter (100 μ). The sleeves are loaded with the clamps by means of the forceps, and are inserted into the slots of the clamping sleeve. The number of clamps depends on the size of the sleeve; with the increase in the size of the sleeve the number of clamps can be increased.

For the purpose of suturing blood vessels end-to-end the apparatus prepared for this type of suture may be said to consist of six parts (two bodies and metal strips and two hemostatic clamps), and sleeves are inserted which correspond to the size of the vessel. Hemostatic clamps from the apparatus are applied to the ends of the blood vessels which have been liberated from the surrounding tissues, and these not only temporarily stop the circulation but also hold the blood vessel in the apparatus when its ends are being approximated before suturing. The body of the apparatus with a half-sleeve is brought up under the end of the blood vessel, which is compressed by a hemostatic clamp; the grip of the clamp is put into a special slot in the body. The end of the blood vessel is pulled out with forceps and closed with the other half-sleeve which has been inserted into the metal strip. The metal strip is attached to the body by a catch. The end of the blood vessel projecting from the sleeve is rolled over onto the edge of the sleeve in the form of a cuff by two forceps and is kept from slipping by special clamp-forceps. The other end of the blood vessel is prepared in a similar way. The everted blood vessel ends are washed out with a physiological solution from a syringe before suturing in order to remove blood clots and to displace air. Then the two halves of the apparatus are approximated. The distance between the approximated blood vessel ends is established by means of a regulator bolt on a scale which is located in the body of the apparatus; care is taken to avoid compressing the blood vessels together. With pressure on the lever the clamps come out of the clamp sleeve slots, pierce the blood vessel cuffs, and after encountering the dies on their route, are bent in a B-shape, suturing together both blood vessel walls. The suturing is effected simultaneously with all the clamps over the entire circumference of the blood vessel. In order to remove the apparatus from the sutured blood vessel it must be taken apart in a reverse order.

For the purpose of suturing blood vessels end-to-side the apparatus is prepared in the following way: the regular bolt is removed and replaced by another, the hemostatic clamps are replaced, the clamp-forceps and sleeve stops (which are inserted into the opposite side) are replaced. The clamping

sleeves are left unchanged. The apparatus, prepared for this type of suture, is also in six parts, and sleeves are inserted which correspond to the size of the blood vessel to be attached. In a manner similar to suturing blood vessels end-to-end the hemostatic clamp and part of the apparatus containing the sleeve stop are applied to the vessel being attached. The blood vessel is cuffed at the end and its cuff is grasped with a clamp forceps; here, more of the end of the blood vessel is taken, because the sleeve stop for this type of suture is longer. A fork clamp is applied to the blood vessel into the side of which the smaller vessel is being sutured, crossing it at two places at a distance of 1.5 to 2 centimeters from each other. The segment of blood vessel located between the two limbs of the clamp should not be stretched, for which purpose the blood vessel is raised during the application of the clamp. Then, with a sharp hook the anterior wall of the blood vessel is drawn out, and an opening is cut into it with scissors, which corresponds to the size of the sleeve stop. The end of the sleeve stop with the blood vessel opened up on it is introduced into the opening. Simultaneously, the fork clamp is fastened to the stop half of the apparatus with a locking spring; then, the clamping body is brought up, the metal strip of the clamper is attached, and it is fastened with a catch. The clamping sleeve encircles the stop and is moved along it in the direction of the shoulder of the sleeve. The dies for bending the clamps are located on the opposite side of the stop sleeve shoulder when compared with the sleeve for suturing blood vessels end-to-end. When the clamping sleeve is approximated with the stop the distance needed for joining the blood vessels to be sutured without compression of them is established on the scale by the regulator bolt. The suturing is accomplished in the same way as for joining theblood vessels end-to-end. In order to remove the apparatus from the blood vessels it is taken apart.

After a certain adjustment of it this apparatus can be used to apply epineural suture to the ends of the nerve. The prepared apparatus consists of four parts (thenerve holders are not separable from the body), and sleeves are inserted which correspond to the size of the nerve. Holders are applied to the ends of the nerve which have been freed from the surrounding tissues, simultaneously applying them to the half-sleeves so that the nerve sections coincide with the ends. Preparation of the epineurium for suturing is accomplished by the sleeves by bringing the two halves of the apparatus together. For this purpose the sleeves have movable cuffs, which embrace the nerves and the slots of which

are traversed by magazines and dies. When the nerve ends are approximated and when the cuffs embracing them meet the halves of the apparatus begin to slide along the cuffs, moving toward one another, and the magazines and dies which are sunk into the epineurium carry its cylinder before them. Final approximation of the sleeves is accomplished by the regulator bolt, and the distance is reckoned on the scale of the body of the apparatus. This concludes the preparation of the nerve for suture. By pressing on the levers, the epineurium is sutured simultaneously throughout its entire perimeter. The apparatus is removed and successively broken down into parts.

The general purpose blood-vessel-nerve suturing apparatus was tried out experimentally and used clinically; experimentally, blood vessels were sutured end-to-end and end-to-side (N. P. Petrova), and nerves were sutured (T. V. Kalinina). For the purpose of end-to-end suturing of blood vessels the apparatus was used in 125 experiments. The sutures were applied to the thoracic and abdominal aorta, the inferior vena cava and other blood vessels. Arteries and veins measuring from three to eight millimeters in diameter can be sutured with the apparatus using different clearances from 0.2 to 8 millimeters.

The apparatus is simple to handle and convenient to operate. The sutures applied to the blood vessels end-to-end are tight and firm. The clamps, which are located outside the blood vessel at equal distances from one another, do not interfere with the nutrition of the blood vessel wall, do not constrict the blood vessel at the site of the suture and do not cause any thrombus formation, because they are connected with the intima over a great distance. Despite the considerable stretching of blood vessel ends during suturing of the thoracic and abdominal aortas, there is no separation of the clamps, and the suture is of good quality.

The sutured blood vessels grow together well on the 10th-14th day. The suture line is smooth and shiny and without any thrombotic onlays. The site of the suture is covered with a thin layer of endothelium. No inflammatory reaction or proliferation of the connective-tissue scar is observed.

The apparatus for end-to-end suturing was also applied in grafting of blood vessels (thoracic and abdominal aortas, inferior vena cava, carotid and femoral arteries and other blood vessels), for the suturing of ureters and others. In the process of grafting the apparatus sutures well both blood vessels preserved by different and prostheses from alloplastic material. The clamps in the suturing process penetrate well through the blood vessel wall and through the prosthesis

and hold them; they do not cut the blood vessel and do not go into its lumen. On X-ray after grafting of the abdominal aorta with the capron prosthesis full patency of the aorta and of the prosthesis are noted 115 days after the operation (see Fig. 3). At autopsy and examination of the large blood vessels into which prostheses were transplanted it was noted in the majority of experiments that they fuse well and that the internal surface is smooth and shiny. The method of applying sutures end to end by means of an apparatus is not complex and is available to any surgeon.

Fig. 3. Vasogram of Abdominal Aorta 115 Days After Operation -- Transplantation of Capron Prostheses

Joining blood vessels end to side by means of the apparatus is somewhat more complicated. Here, in addition to a more complicated method of joining the blood vessels, the approach to the blood vessel being sutured is more difficult and less convenient (for example, in the case of portal hypertension), which complicates the operative procedure. In addition, for good union of the blood vessels end to side with complete and hermetic sealing of the anastomosis an opening needs to be cut out into the main blood ves-

sel which corresponds strictly to the size of the stop sleeve being introduced into it. If the opening is too large complete hermetic sealing of the suture may not be achieved in one of its sections. In these cases, it is necessary to resort to additional application of sutures on a blood vessel cuff, which may impoverish the outcome somewhat. However, the anastomosis by means of this apparatus, even with the application of additional sutures, is much more reliable than by hand suture. When the suture is properly applied no thrombosis occurs. In certain cases, after the application of an anastomosis with additional ligature sutures, small mural onlays are noted over a small area, but they leave adequate patency and function of the blood vessels.

The methods of joining nerves by means of the apparatus require the presence of epineurium at the ends of the nerve, the selection of detachable sleeves according to the size of the nerve, straight sections of it, and the approximation of the ends with the ends of the half-sleeves. With the observance of these conditions the nerve ends are properly apposed to one another, and the clamps which are arranged along the perimeter in the epineurium do not touch the nerve fibers. The suture is of knotted form with a minimal diastasis between the nerve sections.

Numerous experiments on animals performed on the sciatic nerve in its middle third have shown the strength and reliability of the suture. Histological investigations (O. R. Bogomolova) have shown very small infiltrates around the clamps and the growth of regenerating fibers near them.

This apparatus, after extensive experimental checking, was applied clinically for various diseases and blood vessel and nerve injuries (Institute imeni Sklifosovskiy -- the P. I. Androsov Hospital; Military Medical Academy imeni Kirov -- the Hospital of V. N. Shamov and A. N. Berkutov, the Moscow City Hospital No 40 and others).

Patient B., age 29, was admitted to the Moscow Hospital No 40 on 22 March 1957 with a diagnosis of aneurysm of the left femoral vessels.

On 9 December 1956 the patient had sustained a bullet wound in the area of the left thigh. After the wound he was brought to the regional hospital, where he was given medical care, and the bleeding was stopped. A week after the wound an aneurysm of the left femoral artery was diagnosed; the patient was sent to the regional hospital where an operation was performed -- removal of the bullet from the left buttock. The condition of the patient deteriorated, pains began to occur in the left lower extremity; he had shortness

of breath and palpitation, for which he was sent to Moscow.

On admission to the hospital it was noted that the left leg was more cyanotic than the right, the veins were dilated in the area of the leg and lower third of the left thigh. On the anterior surface of the thigh in its middle third there was a post-operative scar 15 centimeters in length which was adherent to the subjacent tissues. There were small operative scars also on the inner surface of the thigh and in the area of the left buttock. A "humming-top" murmur was heard along the course of the vascular bundle from Poupart's ligament to the Popliteal recess. No pulse was felt in the dorsalis pedis artery. The movements in the knee joint were limited; flexion was possible only to a right angle. In the other joints movements were maintained.

On 2 April the patient was operated (N. P. Petrova) under ether-oxygen anesthesia (70.0 cubic centimeters). Through an incision along the course of the vascular bundle in the middle third of the left thigh the vein and artery were exposed and dissected out above and below the aneurysmal sac, and the sac itself was dissected out. The aneurysmal sac was 7 x 5 centimeters and the communication between the arteries and the vein measured 2.5 centimeters. Hemostatic clamps of the apparatus were applied to the exposed blood vessels below and above the aneurysmal sac. Then, the arteries and veins were separated in the area of their communication. The aneurysmal sac was excised, and a diastasis of three-four centimeters was formed between the ends of the arteries.

After freshening the ends of the arteries a circular mechanical end-to-end suture was applied. For the purpose of applying the suture paired detachable sleeves 4.9 millimeters in diameter were put into the apparatus, and the blood vessel ends were everted onto them without any special tension. The halves of the apparatus were brought together with tension on the ends of the blood vessel and were sutured with a clearance between the sleeves of 0.5 millimeter. The suture obtained was hermetically sealed, and there were no hemorrhages. A lateral longitudinal suture was applied to the defect formed in the femoral vein using a single-clamp apparatus. However, in view of the extensive injury its lumen was narrowed considerably, and therefore the vein was ligated above and below the applied suture. The operative wound was dried and closed in layers.

The post-operative period was uneventful. The wound healed by primary intention. A distinct pulse appeared in the dorsalis pedis artery. The extremity became warm.

On the 10th day the patient began to walk, and after

23 days he was discharged home: he walks easily without a cane and he can put his full weight on the left lower extremity.

The general purpose blood-vessel-nerve-suturing apparatus makes it possible to suture blood vessels end-to-end, end-to-side, and to apply sutures to nerves; it can be used extensively both experimentally and in clinical practice.

Methods of Restoring the Continuity of a Blood Vessel in Battle Wounds

G. L. Ratner, Candidate of Medical Sciences

The most efficient method should be used for obtaining a good result after a restorative operation on a blood vessel. At the present time, in order to restore blood vessels three methods are used: lateral suture, circular suture and blood vessel grafting.

The indication for a lateral suture is a wound of only one wall of the blood vessel of small extent. In this case the suture is applied in a transverse direction; then, it is possible to avoid constriction of the blood vessel at the site of the suture. The lateral suture may be placed by hand, best in a "u" shape with sutures everting the intima or by a mechanical method using a single-clamp apparatus. The suture should be begun in the middle of the wound, which makes it possible to orientate the wound edges correctly and distribute the sutures more uniformly. In order to avoid the suture's cutting through when they are tightened the wound edges are approximated. In the beginning, two or three sutures may also be placed, and then the ligatures may be pulled up and tied simultaneously.

The lateral suture is the simplest and most available method of restoring the continuity of the blood vessel. N. A. Bogoraz mentions that lateral suture is expedient even in a case where it severely constricts the lumen of the blood vessel.

Contraindications to the placing of the lateral suture are extensive defects in the blood-vessel wall as well as cases where the viability of the edges and wall of the blood vessel in the area of the wound are doubtful. Then, recourse is had to excision of injured tissues, and another method of restoring the blood vessel is utilized.

The next method to which a surgeon should resort is the laying of an end-to-end anastomosis of the blood vessel. During the Second World War blood-vessel suture was applied in a total of 1.4 percent of all blood vessel wounds (V. I. Struchkov); however, at the end of the war many Soviet surgeons came to the conclusion that blood-vessel suture has definite advantages over ligature of the blood vessels (A. I. Arutyunov, A. A. Bekzadyan, S. L. Libov, B. V. Petrevskiy, V. L. Khenkin). According to the results obtained, circular suture of the blood vessel is in second place after lateral suture.

The indication for laying an end-to-end circular sut-

ure is a complete or almost complete tear of the blood vessel with a defect no greater than five centimeters. The ends of the blood vessel may be pulled together from such a separation because of the elasticity of the artery and the reduction in its tension achieved by flexion of the extremity. In individual cases it is permissible to apply a suture even with a diastasis, but it should always be kept in mind that great tension on the blood vessel leads to a tearing through of the sutures and impoverishes the nutrition of the ends of the artery as a result of which necrosis of the blood vessel and secondary hemorrhages may occur. In addition, excessive tension on the blood vessel leads to a constriction in the lumen of the artery and to a persistent vascular spasm. Both of these factors contribute to the development of thrombosis.

As is known from the works of M. V. Svyatukhin and Jenk and co-workers, after a blood vessel wound great changes are observed in the blood-vessel wall in the vicinity of the wound. Macroscopically, these changes are not always seen; on microscopic examination a separation and fragmentation of cellular and fibriller structures of the blood-vessel wall are almost always noted. The excision of one centimeter from each end of the blood vessel in apparently uncharged areas, as has been done by Jenk and co-workers, undoubtedly improves the results of restorative surgery. However, in a number of cases after excision of the ends the defect in the artery increased to such an extent that it was impossible to lay an end-to-end anastomosis, and restoration of the continuity of the blood vessel had to be done by grafting.

Experimentally, we tried out different variants of applying vascular circular suture, and we limited ourselves to the suture proposed by A. I. Morozova using everting "U"-shaped sutures as holding sutures for the largest blood vessels. For arteries of smaller caliber G. M. Solov'yev's invaginating suture may be used. Very good results are obtained through the application of mechanical suture by a vascular-suture apparatus. For surgeons who have had no experience in vascular surgery and who do not have the vascular-suture apparatus at their disposal adaptations facilitating the application of suture will undoubtedly be useful.

With too large a defect the suturing of the ends of the blood vessel becomes impossible, and the surgeon has to resort to one of the methods of so-called "vascular grafting on a pedicle". A section of femoral artery, for example, can be replaced by the profundus femoris artery by this method. For this purpose the profundus femoris artery is

transected several centimeters from the site of its origin. The peripheral end of the artery is ligated, and the central end is turned upwards if the defect in the femoral artery is above the site of origin of the profundus femoris artery and is sutured with the central end of the femoral artery. If the defect in the femoral artery is located below the site of origin of the profundus femoris artery the latter is turned downward and connected with the peripheral end of the femoral artery (M. S. Lisitsin, G. D. Obraztsov).

According to the same principle use may be made of the posterior tibial artery for substitution in the popliteal artery, and the external carotid may be used for substitution in the popliteal artery, and the external carotid may be used for substitution of a defect in the internal carotid artery. The advantage of this method consists in the fact that it essentially is not much different from the ordinary end-to-end anastomosis. The blood supply and innervation of the transplanted section are not disturbed, because it maintains its relationship with the original tissues surrounding it. Unfortunately, vascular grafting on a pedicle cannot always be used, and more often use has to be made of a free graft.

In selecting a vascular graft suitable for use under military field conditions there are a number of additional requirements in addition to the ordinary ones for a graft. First of all, a large-scale preparation of the grafts should be possible; secondly, the taking of the graft or the preparation of it for transplantation should not take up much time; thirdly, the maintainence and transportation of the grafts should be possible under military field conditions. Based on these conditions, one of the best grafts should be considered the venous autograft. Actually, in past wars, beginning with the First World War, this type of graft had been used more often than the others. According to the data of de Bakey and Simon, in 2471 cases of blood vessel wounds in the allied armies during the World War a total of 47 vascular grafts was performed with the use of the venous autograft. V. L. Khenkin, during the period of the Second World War, performed 14 operations for restoration of blood vessels after wounds in the troop area and two operations for an aneurysm which had already formed, using a venous autograft.

In the majority of cases the use of the venous autograft gives good results, but from time to time are still appearing about aneurysmic dilatations of the venous graft and even ruptures of it, which, apparently, are associated with a weakness of the vein wall which is poor in fibrillar connective-tissue elements. In order to prevent this compli-

cation the wall of the graft may be reinforced, enveloping the graft outside by muscles (A. A. Polyantsev), fascia lata (Chung) or a synthetic porous fabric (G. L. Ratner).

The use of the venous autograft prolongs somewhat the time of the operation. Thereby additional trauma is inflicted on the wounded person. In addition, the venous graft requires a particularly cautious operation, because the thin wall of the vein is readily traumatized, and the sutures cut through even with slight tension. These shortcomings of venous autografting do not give us the right to consider it ideal; nevertheless, the graft can be utilized for arterial grafting of arteries which are not of large caliber. The use of venous autografting in the presence of high blood pressure, thrombophlebitis, varicose veins, hemorrhoids, varicose veins of the spermatic cord in the wounded person is contraindicated. However, where it is needed to substitute an arterial defect and in the absence of another type of grafting these contraindications are not taken into consideration.

In peace-time surgical practice in the past ten years the use of the arterial homograft has become very widespread. Most frequently, at the present time use is being made of homografts preserved in salt solutions (usually, Tyrode's fluid in its various modifications) at a temperature of +2° to +6° and homografts prepared by the method of freeze-drying. The latter method possesses the advantage that grafts exposed to prolonged dessication at low temperatures and sealed in ampules may be preserved at any temperature indefinitely. A great defect of the frozen-dried graft, which makes it poorly suited to military field conditions, is the fact that before using the graft should be immersed in physiologic solution for 30-90 minutes. In the case of a blood-vessel wound it is impossible to predict beforehand which method of arterial restoration would be more advantageous to use. This becomes clear only after exposing the site of the blood-vessel wound. There is hardly any surgeon under military field conditions who would, following exposure of the blood vessel, spend so much time in soaking the graft.

The arterial homograft preserved in salt solution does not have this shortcoming. It may be used immediately. Although keeping the graft in salt solutions requires a lowered temperature, this is the same temperature which is needed for preserving blood; therefore, the preservation of the grafts does not offer any particular difficulties.

Many research workers believe that after 40-42 days of preservation the graft becomes unsuitable for transplantation. Our experimental work done in conjunction with V.

S. Kazakov and L. I. Shmukler has shown that homografts preserved in 0.85 percent sodium chloride solution up to 105 days "take" and function as well as grafts which have been preserved in more complex solutions. Such transplants may be prepared readily under any conditions, whereas preparation of frozen-dried transplants requires special conditions and supplying them can be organized only on a centralized basis. Taking into consideration what has been stated it may be considered that under military field conditions it is more expedient to utilize arterial homografts preserved in salt solutions.

The perspective of using vascular alloplasty under military field conditions is exceptionally tempting. Actually, a prosthesis of a section of blood vessel may be prepared from artificial material in several minutes; for the purpose of transporting and preserving this material and ready-made prostheses no special conditions are required; the large-scale provision of protheses is completely unlimited; finally, their sterilization is simple and reliable.

Prostheses are used with the greatest success which have been prepared from porous synthetic fabrics (capron, nylon, dacron, orlon, tephlon, etc.), and lately, from polyvinyl-alcohol sponge. Vascular prostheses have been checked considerably experimentally, and are being used successfully for substitution of areas of different blood vessels including the thoracic aorta in people, and there are no contraindications to their use in military field surgery.

In the operation of vascular grafting we recommend adherence to the following principles which we have elaborated after an analysis of a considerable number of our own observations experimentally. In diameter the graft should correspond precisely to the caliber of the artery or be somewhat narrower than it; thelength of the graft should be five to ten millimeters less than the length of the blood vessel defect; injury to the graft wall should be avoided; throughout the entire operation the ends of the blood vessel and the graft should be irrigated with physiologic solution or with a weak heparin or sodium citrate solution; additional sutures on bleeding points on the suture line should be applied only in case compression of these points for one or two minutes does not stop the bleeding; after transplantation the graft is desirably covered by the surrounding tissues.

The success of restorative surgery of the blood vessels depends not only on impeccable operative technique but also to a great degree on the timely performance of countershock and antispastic measures. The propylactic use of anti-

coagulents is particularly expedient in the restoration of blood vessels of small caliber (less than five or six millimeters). Anticoagulants may be used only in the case of a reliable blood vessel suture.

After the restorative operation on the blood vessel a slight immobilization of the extremity is recommended. Thereby, the slightest compression of the blood vessel should be avoided not only in the area of the operation but also over the entire extent of the blood vessel.

The Provisional Ligature and the Provisional Prosthesis in Wounds of the Blood Vessels of the Extremities

B. A. Matveyev, Colonel of the Medical Service

The number of wounded persons with injuries of the blood vessels has not been the same at various times and with different methods of waging battle. On the average, it did not exceed 1 to 1.5 percent of the total number of wounded. However, despite the small percentage of wounds this type of military pathology deserves more serious attention because of its extremely unfavorable immediate and late results.

The application of ligatures has been the principal method of definitive hemostasis to date in the case of blood vessel wounds. Numerous attempts to use a vascular suture under battle conditions during the war in the Balkans and during the First World War (N. A. Bogoraz, V. R. Braytsev, A. B. Krymov) have not been convincing, and the use of the vascular suture has not become widespread. At the beginning of the Second World War the following principles were laid down in the surgery of gun-shot wounds of the blood vessels: in the case of primary hemorrhages -- the application of a double ligature on the blood vessel in the wound; in the case of secondary hemorrhages -- ligation of the blood vessel in the wound and over some distance; in the case of fresh wounds, under conditions of undoubted asepsis and where it is possible to keep the wounded persons at the stage of evacuation where the operation were performed during the post-operative period, the application of vascular suture was permitted. (The Experience of Soviet Medicine in the Second World War 1941-1945, Vol 19, p 25). The reservations that there be "undoubted asepsis" and that a "post-operative routine" be enforced almost completely excluded the operation of blood-vessel suture application at that time.

During the Second World War, just as in preceding wars, most often ligatures were applied in cases of fresh blood-vessel wounds. The simplicity, availability and reliability of blood-vessel ligature created an almost unquestioned authority for this method of definitive hemostasis in war. A considerable percentage of cases of gangrene of the extremities were considered an inevitable occurrence. However, at the present time, such a situation can and should be changed. In the current state of science we can no longer be satisfied with the inevitability of tying off the main blood vessels of the extremities as a definitive measure. The possibilities of modern medicine enable

us to replace the ligature with suture or with a provisional prosthesis of the injured blood vessel in cases where necessary. The time has come and conditions are ripe for ealizing the dream of N. I. Pirogov, who wrote: "...replacement of the ligature with some other method would be actual progress."

When a main blood vessel is ligated the preservation of the viability of the extremity depends largely on the condition of the collateral circulation. In the case of gunshot wounds accompanied by shock, hemorrhage, destruction and contusion of the tissues, the possibilities of the collateral circulation are markedly impoverished or completely absent. It is, therefore, not surprising that ligation of the arterial blood vessels in gunshot wounds of the extremities very often leads to gangrene. Thus, according to the data of Struchkov, necrosis of the extremities was observed in the following cases: after ligation of the femoral artery in 15.8 percent; of the popliteal artery, in 26.3 percent; of the axillary artery, in 16.0 percent; and of the subclavian artery, in 20 percent, etc. In cases of combined wounds of the arterial blood vessels and of the bones the percentage of gangrene reached 40.

Despite the great achievements in the post-war period in the technique of applying vascular suture (mechanical suture by means of various apparatuses, the hand suture of Solov'yev, suture by means of the Donetskiy ring and others) as well as the indubitable progress in blood-vessel prosthetics, there are no specific recommendations as yet for the replacement of the ligature, and where necessary it, apparently, will be used extensively again.

While we do not consider the vascular suture, and particularly plastic replacement of injured blood vessels the method of choice for a troop area, it may be supposed that specifically these methods may be applied in the army area or frontline area. However, as is well known, one cannot count on the early arrival of the wounded at these stages. Therefore, it seems very important to us to carry out a two-stage restoration of the arterial circulation in the extremity when the integrity of the blood vessel is impaired. The first stage can be an ordinary ligature or provisional prosthesis of the injured blood vessel, which should be accomplished no further back than in the field medical installation of the division and regiment service areas.

In case of application of ligature all the existing facilities should be used simultaneously, which contribute to restoration of the collateral circulation; novocain block of reflexogenic areas (places of bifurcation of the blood

vessels above and below the ligature), intraarterial injection of novocain into the blood vessel above the site of the wound, paranephric block according to the method of Vishnevskiy, novocaine block of sympathetic ganglia corresponding to the localization of injury of the arterial vessel, blood transfusion, etc. Keeping in mind the future restoration of the patency of the injured and ligated blood vessel, all the measures described should be regarded as methods of combatting hemorrhage and prolonging the survival of tissues. Wounded to whom the ligature has been applied should be sent immediately to the army or frontline field hospitals for replacement of this provisional ligature with a vascular suture or with a permanent prosthesis. In connection with this, an attempt should be made to shorten the times that a tourniquet is applied. Survival of tissues under the tourniquet is much less than it is when there is a sudden stoppage of the circulation in the main blood vessel. Thus, after a sudden stoppage of the blood flow to a main vessel, for example in embolism, the extremity may remain viable for 10 hours (Z. V. Ogloblina), and in cases where injured blood vessels areligated this period of time may be even longer.

Patient A., born in 1935, was accidentally wounded with a knife on 20 March 1957 in the upper third of the left thigh. The patient was brought to the hospital after 50 minutes where he was operated for a complete transection of the femoral artery. Silk ligatures were applied to the ends of the transected blood vessel. After 24 hours the patient developed pronounced ischemic pains in the leg, the edema increased. The next day, these signs increased further. The skin on the dorsum of the foot and leg assumed a mottled violet hue; pain sensation began to disappear in the skin of the leg. In this condition the patient was promptly evacuated to Leningrad. Immediately on arrival of the patient an operation was performed -- application of sutures to the injured artery. The circulation in the extremity was restored. Afterwards, the patient developed chronic trophic disorders in the form of ulcers on the dorsum of the foot and on the heel.

Replacement of a ligature of the arterial vessel by a vascular suture is an indubitably effective measure. Despite a certain percentage of failures in blood-vessel suturing (from 4 to 10 percent, according to Struchkov), the majority of the wounded persons of this group can have their organs saved and they can be kept free of diseases associated with ligation of the main arterial blood vessel (intermittent claudication, rapid fatigability, chilliness, tendency to frost-bite, dystrophic disorders, etc.). However, vascu-

lar suture cannot be considered an operation for the troop area; here, something different should be used, something simpler than suture but more advantageous than vascular ligature. In this connection the use of provisional prostheses in place of provisional ligatures should be considered promising in the division and regiment service areas with subsequent replacement of them with permanent prostheses or vascular suture in the army and frontline field hospital.

The provisional prostheses can assure the earliest possible recovery of circulation in the wounded extremities; by means of it the collateral circulation can be effectively and rapidly restored, and a firm basis can be created for plastic surgery of the blood vessels in the army and frontline areas with the greatest benefit and security.

The provisional prosthesis should be simple and convenient to use; the attachment of it is not complicated; it should not injure the blood-vessel wall, and it should keep the prosthesis firmly in place. Such a prosthesis can be prepared only from solid material.

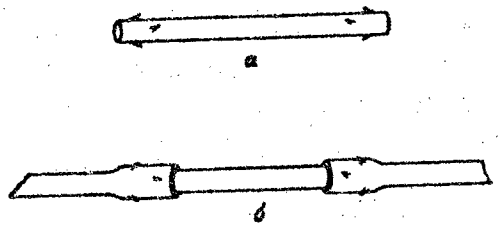
In the literature there are reports to the effect that in war time it is not advantageous to use solid prostheses for blood vessels on account of their frequent obstruction with thrombi. DeBakey and Simon, Mustard, G. M. Solov'yev and D. D. Venediktov believe that the solid prosthesis can be used only exceptionally in cases of extreme necessity. In our opinion, the military circumstances should also have a bearing specifically on such "exceptions".

Our co-worker (A. I. Kalistov) has shown, in experiments on rabbits, the advantage of solid prostheses prepared from capron fabric, the patency of which is maintained for a long time. Almost any prosthesis material can be used for a prosthesis which functions for 10 hours. For provisional prosthesis of blood vessels we suggest capron or polyethylene tubes at the ends of which there are three or four sharp hooks for attachment (see Figs. a, b).

In the case of a blood vessel wound debridement is performed with excision of the ends of the injured artery.

The defect formed between the central and peripheral ends of the injured vessel is replaced by provisional prosthesis. For this purpose the prosthesis is first inserted into the peripheral end of the artery and then into the central end. Experiments on animals show a completely adequate strength of fixation of it by the terminal hooks. Such prostheses are capable of functioning for a very long time. If, after one or two days, a thrombosis occurs at the site of the prosthesis the extremity does not become necrotic, because in this time the collateral circulation has been re-

covered. The purpose of this prosthesis also consists of the fact that by means of it it is possible to prevent ischemic gangrene during the first day after the wound, and in this period it is possible to evacuate the wounded person to a medical installation where a suture or permanent prosthesis can be applied.



a -- Diagram of capron prosthesis with hooks at the ends of the prosthesis tube; b -- diagram of provisional blood vessel prosthetics by means of a capron (or polyethylene) tube.

Because of the exceptional rarity of large arterial vessel wounds in peace time it is very difficult for one surgeon or even a group of surgeons to accumulate sufficient clinical material. It would be very desirable for all army surgeons to collect observations on injured large blood vessels and, where it is possible, to give treatment without being limited by the application of a ligature as a definitive measure but rather utilizing it as a provisional measure in controlling hemorrhage and with the subsequent restoration of themain blood vessel by means of vascular suture or by means of prosthesis. It would be even more desirable to use provisional prostheses instead of the ligature.

Treatment of Patients with Chronic Coronary Insufficiency in the Gurzufskiy Clinical Sanitorium

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Candidate of Medical Sciences

One of the types of pathogenetic treatment of patients with chronic coronary insufficiency is sanatorium-health resort treatment, which should be regarded as a continuation of hospital or outpatient treatment.

The main problem of our work consisted in a study of the efficacy of sanatorium-health resort treatment of patients with chronic coronary insufficiency and in an attempt to determine the indications and contraindications to sending these patients to the Gurzufskiy Clinical Sanatorium of the Ministry of Defense.

During the past two and a half years 259 patients with chronic coronary insufficiency have been treated in the sanatorium; of these 22 were women. There were five persons who were 35-40 years of age; 85, 41-50 years of age; 148, 51-60 years of age; 21, 61-70 years of age. Therefore, 93.4 percent of all the patients were over 45 years of age. During the winter 16.3 percent were treated in the sanatorium; during the spring period, 23.3 percent; in the summer period, 22 percent; in the autumn, 38.4 percent of all patients.

According to the manifestations of the clinical picture we divided all patients with chronic coronary insufficiency into two groups. In the patients of the first group (193 persons) the disease was manifested in the form of occasional, short attacks of angina pectoris. In 78 of them the pains were retrosternal with a typical radiation to the left arm or left hand, were of a compressive nature and occurred in association with neuropsychic strain; occasionally, with pronounced physical exercise. In the other 115 patients only cutting or aching pains were observed in the cardiac area, sometimes with a radiation to the left arm; with emotional excitement or overfatigue at the end of the work day. However, many of them in the past had had typical attacks of angina pectoris. In all cases the pains were eliminated by means of validol or nitroglycerin. The anginal attacks were noted for one-three years in 81 persons; four-six years in 66 persons; seven-nine years, in 22 persons.

On physical examination extension of the heart borders to the left up to the mid-clavicular line was found in 80 percent of the patients of the first group; in 46 percent there was a muffling of the heart sounds; in 30 percent, a soft or blowing systolic murmur at the cardiac apex. In

19.1 percent of the patients an increase in the pulse frequency was observed to 84-106 beats a minute in connection with dystrophic changes in the myocardium or vegetative neurotic reactions. The blood pressure was equal to 110/70-135/85 millimeters of mercury, and in patients with hypertensive disease, 140/95-150/100 millimeters.

On X-ray, an enlargement of the left ventricle was found in the majority of cases, and the aorta was elongated and somewhat thickened. On the EKG no essential changes were found in this group of patients. Only in two patients after physical exercise were a discordant displacement of the ST interval and a flattening of the T wave found in leads 2 and 3. The quantity of blood cholesterol in the patients investigated did not excede 188 percent. On clinical analysis of the blood and urine no pathological changes were noted.

The majority of the patients complained of an increased irritability, irascibility, and a sleep disturbance. In certain patients angioneurotic reactions of the blood vessels of the fingers, sweatiness, tremor, and a quickly-appearing permanent red dermographia were observed. Therefore, in patients of the first group a disturbance in the neural regulation of the coronary circulation, that is, a vegetative-dyskinetic type of angina pectoris, or, according to G. F. Lang, coronary angioneurosis, predominated in the clinical picture of the chronic coronary insufficiency. The morphologic changes in them apparently were of a secondary significance. Therefore, in the degree of expression of chronic coronary insufficiency the patients of this group may be referred to the first-degree group according to the L. I. Fogel'son classification.

Almost all the patients were discharged from the sanatorium with improvement. In half the patients the pain stopped during the first 10 days and did not recur during their stay in the sanatorium. In 48.5 percent the pains were repeated several times throughout the course of treatment in connection with physical exercise (athletic games, prolonged excursions, etc.), or in connection with a disturbance in the established routine (taking of sun baths, excessive smoking). Afterwards, the patients usually did not resort to the use of validol or any other drugs for dilating the coronary vessels. Three patients (1.5 percent) were discharged without any change in the feeling of well being. In patients with tachycardia the pulse became normal at the end of their stay in the sanatorium; the blood pressure decreased somewhat, and in the presence of hypertension, it dropped to normal figures.

It was impossible to find any kind of relationship be-

tween the efficacy of treatment and the time of the year, although it might have been supposed that warm or cold weather could have impoverished the results of treatment. Many patients tolerated the warm weather poorly (headaches, weakness occurred; in some, palpitation).

In patients of the second group (66 persons) the disease was manifested by quite frequent and typical retrosternal pains with radiation to the left arm on physical or neuropsychic strain, and tension angina wasobserved. Thirteen patients had had myocardial infarction six or more months previously. Twenty-one persons had had the disease less than three years; 13, from four to five years; 13, from seven to nine years; 14, 10 or more years. In all the patients arteriosclerotic cardiosclerosis and arteriosclerosis of the coronary vessels were noted; in 58 of them there were signs of coronary insufficiency of the first degree.

On electrocardiographic examination almost all of the patients of this group showed a low voltage in the electrocardiogram, flattening of the T wave in two standard leads, and in 12 patients, a delay in intraventricular conduction (QRS 0.11-0.22), that is changes characteristic of a diffuse involvement of the cardiac muscle (cardiosclerosis). Of 13 patients who had had myocardial infarction electrocardiographic changes were found in only seven attesting to focal disturbances in the cardiac muscle. In 47 patients of this group an increased quantity of cholesterol was found (195-278 milligrams percent). The rate of propagation of the pulse wave along the vessels of elastic type as determined by the sphygmogram made with an N. N. Savitskiy mechanocardiograph was from 640 to 1210 centimeters/second. The stroke volume of the heart was equal to 43-110 cubic centimeters; the minute volume, 2.9-7.2 liters (V. F. Shubin).

Therefore, in patients of the second group signs predominated which attested to pronounced sclerotic changes in the coronary vessels and in the cardiac muscle. According to A. L. Myasnikov's classifications these changes could be referred to the third or fibrous stage. According to the degree of expression of the disturbance in the coronary circulation chronic coronary insufficiency in the patients observed should be classified as second degree (according to the classification of L. I. Fogel'son).

Walks along one or two itineraries and therapeutic physical culture were prescribed for the majority of patients of this group in the sanatorium; during the cold weather, sea water rubs, a circulatory shower, coniferous-sea water and sea water baths; during the warm part of the year, light-air baths, sea baths without swimming and light

athletic games (croquet, bowling). In addition, bromides and symptomatic therapy were prescribed for the patients throughout the entire treatment period. No harmful reactions were noted to these procedures with the observance of established norms.

At first, it was recommended that the combination of procedures using a protective routine be prescribed for patients with frequent attacks of angina pectoris; afterwards, a tonicizing routine. According to the subjective evaluation of the sanatorium treatment the attacks of angina pectoris stopped completely in 13 persons during the first week. In the second half of their stay in the sanatorium the attacks became fewer in 35 patients; the pains usually passed without the use of nitroglycerin or validol. Eleven patients were discharged without any change in their condition, and seven, with a deterioration in their feeling of well being.

During the warm season of the year more patients were discharged who did not note any improvement or who had a worsening in their feeling of well being. The majority of those treated in the sanatorium during the warm part of the year complained of malaise, weakness, palpitation, pains in the cardiac region after a brief period of being in the sun.

Among the patients who had had myocardial infarction, a deterioration in the condition was noted in two; five were discharged without any change in their feeling of well being; the rest were improved. In patients with first-stage hypertensive disease the blood pressure became normal; in patients with hypertensive disease stage II the systolic pressure dropped by 15-25 millimeters; the diastolic, by 5-10 millimeters. In the majority of those treated during the warm part of the year the pulse increased in frequency compared with the usual. In the functional test with physical exercise the reaction of the cardiovascular system was less pronounced prior to discharge from the sanatorium. At the time of a repeated electrocardiographic examination no essential changes were observed. In 12 patients the electrocardiogram spoke for an improvement in the coronary circulation (less pronounced shift in the ST interval and a higher T wave).

In almost all of the patients in whom the systolic index had been increased it turned out to be somewhat decreased at the time of the second examination. The rate of propagation of the pulse wave along the vessels of elastic type decreased in the majority of subjects (Fig. 1); the stroke and minute volume of the heart (Fig. 2) increased. These data attest to an improvement in the function of the cardiovascular system. The quantity of cholesterol decreased in only

20 percent of the patients; in the others it remained increased.

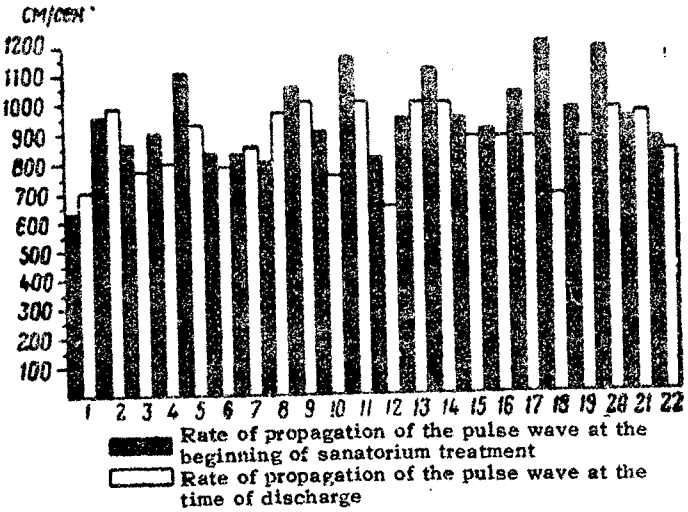
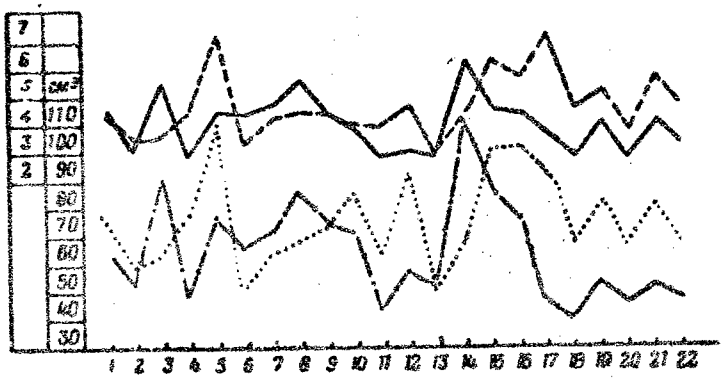


Fig. 1. Diagram of Change in the Rate of Propagation of the Pulse Wave Along the Vessels of Elastic Type at the Beginning and at the End of Sanatorium-Health Resort Treatment of Patients with Chronic Coronary Insufficiency. On the Ordinate Axis the Rate of Propagation of the Pulse Wave is Noted in Cm/sec; on the Abscissa Axis -- The Patients.

Therefore, in the patients of the second group the effect of sanatorium treatment proved to be worse than in the first group. The main cause of this consisted in the fact that in these patients there was a pronounced coronary artery sclerosis with frequent and severe attacks of angina pectoris, which required hospital treatment, and pronounced arteriosclerosis of the cerebral vessels. Other causes of deterioration in the condition of the patients during sanatorium-health resort treatment were disturbances in the established routine, the warm part of the year, unstable metereological conditions (December, January, February and March), the occurrence of intercurrent or an exacerbation of associated diseases (particularly chronic cholecystitis, spastic colitis and others). All this must be taken into consideration in sending patients for treatment.

Therefore, as a result of treatment of patients with chronic coronary insufficiency under conditions of the Gurzufskiy Clinical Sanatorium signs of angina pectoris stopped in 42 percent; the attacks began to occur much less often and were less intense in 50 percent; 5.4 percent were

discharged with no change in their feeling of well being; the angina pectoris became more pronounced in 2.6 percent of the patients. This attests to the beneficial influence of sanatorium-health resort treatment of such patients. Particularly good results were observed in patients with the angioneurotic form of angina pectoris.



_____ Minute volume of the heart at the beginning of sanatorium treatment (in liters)
----- Minute volume of the heart at the time of discharge
-.-.- Stroke volume of the heart at the beginning of sanatorium treatment (in cubic centimeters)
..... Stroke volume of the heart at the time of discharge.

Fig. 2. Diagram of Change of Minute and Stroke Volumes of the Heart at the Beginning and at the End of Sanatorium-Health Resort of Treatment of Patients with Chronic Coronary Insufficiency. On the Ordinate Axis the Minute Volume of the Heart is Noted in Liters (two upper curves) and the Stroke Volume of the Heart in Cubic Centimeters (two lower curves); on the Abscissa Axis -- the Patients.

We do not have the late results of sanatorium-health resort treatment of patients with chronic coronary insufficiency at our disposal. However, according to the data obtained from questioning those who came into the sanatorium a second time, the majority of patients of the first group noted an improvement in their condition for three to six months after discharge, and the majority of those in the second group had recurrences of angina pectoris which usually began immediately after discharge from the sanatorium.

On the basis of the observations we believe that pronounced coronary artery sclerosis with frequent attacks of angina pectoris in the patients is a contraindication to

sending patients for treatment of Gurzuf.

Sanatorium-health resort treatment of patients with chronic coronary insufficiency under the conditions of Gurzuf requires a detailed study with respect to vascular reactions from the effect of climatic procedures, the late results of treatment as well as the indications and contraindications.

Experience in Balneo- and Climatotherapy of Patients With Hypertensive Disease in the Khosta Sanatorium

P. A. Kharitonov, Lieutenant Colonel of the Medical Service

In the Khosta Sanatorium balneoclimatotherapy occupies an important place in the comprehensive treatment of patients with hypertensive disease. Matsesta hydrogen-sulfide baths have the most favorable influence of the balneo-climatic procedures on the patients with hypertensive disease.

During the period from 1949 through 1957 we in the Khosta Sanatorium made observations of the efficacy of treatment of 559 patients with hypertensive disease using Matsesta, radon, coniferous-radon and coniferous baths -- in various seasons of the year. We used the mechanocardiograph (of the Professor N. N. Savitskiy type) in 120 patients with the aim of studying them; these included 96 before and after a course of treatment with Matsesta, radon or coniferous-radon -- and 24 before and after using Matsesta, radon, coniferous baths and sea bathing (after 45-60 minutes).

There were 433 patients with hypertensive disease stage I (according to the GVMU [Main Military Medical Administration] classification); 126 patients had hypertensive disease stage II. There were 445 men and 114 women. There were 172 patients under 40 years of age; 387, over 40 years of age. Subjectively, 52 percent of the patients noted shortness of breath; 60 percent, pains in the heart area; 60 percent, headaches; in the majority an increased irritability and poor sleep were observed. Objectively, muffled heart sounds were heard in the majority of patients; in some, the second aortic sound was accentuated.

The mechanocardiographic data were as follows: of 96 patients with hypertensive disease (76 persons with stage I and 20, with stage II) the pulse was under 70 beats a minute in 51; in 45, over 70; the highest systolic pressure was 200 millimeters; the lowest diastolic pressure was 140; the respective lateral systolic pressure was 180 and 110; the dynamic mean pressure was 150 and 90; the diastolic pressures were 130 and 80. The pulse pressure (according to the difference between the lateral and diastolic blood pressure) was under 40 millimeters in 21 patients; over 40, in 75; the stroke pressure (the difference between the systolic and the lateral pressure) was under 15 millimeters in 60 patients with stage I hypertensive disease; over 15 millimeters, in 16; in eight patients with stage II it was under 15 millimeters; in 12 persons, over 15 millimeters.

The rate of propagation of the pulse wave as determined in blood vessels chiefly of the elastic type was less than 800 centimeters/sec in seven patients; from 800 to 1000, in 48; and from 1,000 to 1,600 in 41 (normally, 675 centimeters/sec on the average). Therefore, in the great majority of hypertensive-disease patients the rate of propagation of the pulse wave was increased. Increase in the rate of propagation of the pulse wave to 800 centimeters/sec indicates slight changes in the vascular wall; from 800 to 1,000, a moderate reduction in their elasticity; over 1,000 centimeters/sec, a considerable reduction in elasticity and thickening. The rate of propagation of the pulse wave was greatest in patients with hypertensive disease stage II.

The systolic volume of the heart was 35-120 cubic centimeters in patients with hypertensive disease; the minute volume of the heart was 3-11 liters; on the average, 5-6 liters. The systolic and minute volumes of the heart were the greatest in patients with hypertensive disease stage I in the absence of any overt signs of cardiac insufficiency and in various patients with stage II who had signs of cardiac insufficiency.

The patients whom we observed were in a stage of circulatory compensation or had the initial signs of circulatory insufficiency; therefore, the signs of anoxia were latent in them or were only slight, and in the majority of cases the circulatory insufficiency was shown only after moderate physical exertion. Of the 96 patients 44 had a reduced systolic heart volume; it was normal in 22 and it was increased in 30. The minute volume of the heart was decreased in 34 patients, normal in eight and increased in 54. A reduction in the systolic volume of the heart and an increase in the minute volume indicates that the heart is under a strain in the majority of patients observed.

As has been mentioned above, treatment of patients with hypertensive disease in the sanatorium was carried out in a comprehensive manner with the use of Matsesta, radon, coniferous-radon, coniferous baths and climatic health resort factors. As a rule, the Matsesta baths were prescribed for patients with hypertensive disease stages I and II in the absence of any attacks of angina pectoris in their history. In the case of patients with hypertensive disease who had anginal attacks in their history and in the case of those patients in whom Matsesta bath treatment was not indicated according to the nature of the associated disease (cholecystitis, bronchitis, gastritis), we prescribed radon, coniferous-radon or coniferous baths.

With the aim of studying the influence of Matsesta,

radon, coniferous-radon, fresh confierous baths and climatic health resort factors on the functional condition of the cardiovascular system of hypertensive disease patients we divided all the patients under our observation into four groups.

In the first group there were 302 patients with hypertensive disease; of these, 264 had stage I; 38, stage II. All the patients of this group were given Matsesta baths with a concentration of hydrogen sulfide of 100-150 milligrams per liter and a temperature of 35-36°; they lasted 8-15 minutes and were given one or two days straight with a subsequent off day; there were 12 baths per course of treatment. In the summer-autumn season all the patients took air baths lasting from 30 to 120 minutes. Sun-baths were recommended for patients with the mild form of hypertensive disease, and they took them on days when they were not taking the Matsesta baths, in the morning (from 9 A.M. to 12 noon) and in the evening (from 5 P.M. to 7 P.M.) on days on which they took the baths; the sun baths were given in a pavilion using an awning which shielded the head and chest from the direct rays of the sun. Sea-baths were prescribed for patients in the stage of circulatory compensation, and they lasted from 3 to 10 minutes; for those with signs of circulatory insufficiency, from two to five minutes. In good weather the patients were in the fresh air for themajor part of the time, slept in balconies or in tents with open windows and doors. The great majority of patients with hypertensive disease took walks of from two to five kilometers a day, occupied themselves in morning gymnastics and some therapeutic gymnastics. Patients in the first stage of hypertensive disease (in the absence of cardiac insufficiency) were given a No 12 diet; those in the second stage, a No 10 diet; and those with obesity, a No 8 diet.

In individual cases dryg therapy was used: bromides with valerian, diuretin with papaverin and iodine preparations.

In the second group there were 146 patients with hypertensive disease; of these 91 had stage I; 55, stage II. In this group there were 32 patients with arteriosclerotic myocardial fibrosis with attacks of angina pectoris in their histories. All the patients in the second group were given artificial radon or coniferous-radon baths, each containing 50-100 Mache units; the temperature of the baths was 35-36°; the duration was 10-15 minutes every other day or two days straight with a subsequent off day; there were 12 baths per course. Air-baths, sun-airbaths, sea-baths, therapeutic physical culture and diet were prescribed according to the

same system as in the case of patients in the first group.

The third group included 107 patients; of these, 74 were in stage I; 33, in stage II. In this group there were 19 patients with myocardial fibrosis with attacks of angina pectoris in their histories. All the patients were given coniferous baths. The temperature of the baths was 35-36°, lasted 10-15 minutes, and was given every other day or two days straight with a subsequent off day; there were 12 baths in the course. The rest of the treatment was given in the same way as for the first and second groups.

In the fourth group there were four patients with hypertensive disease stage I. These patients did not receive any balneological procedures, and they used sea baths in combination with air or sun-air baths, diet and therapeutic physical culture according to the same system as applied to patients in the preceding groups. The systolic blood pressure in this group dropped in two, and the diastolic pressure dropped in one patient. Data concerning the change in the blood pressure under the influence of balneo-climatic therapy in the other three groups are presented in Table 1.

Table 1

Name of procedures	No of patients	Blood pressure dropped (in percentages)	
		systolic	diastolic
Matsesta baths.....	302	88	61
Radon or coniferous-radon baths.....	146	75	69
Fresh coniferous baths....	107	92	72

From the Table it is seen that in the majority of patients with hypertensive disease the systolic and diastolic blood pressures decreased as a result of treatment with Matsesta, radon, coniferous-radon and coniferous baths. A decrease in the blood pressure of the patients was noted in all seasons of the year. In the winter-spring season the systolic blood pressure dropped in 90 percent of the patients; the diastolic pressure, in 73 percent; in the summer-autumn (bathing season) these figures were, respectively, 85 and 69 percent. However, in the patients with hypertensive disease stage I and stage II with signs of cardiac insufficiency the best results were obtained after treatment with Matsesta baths in the spring-autumn seasons when there was no great heat or humidity.

In patients with hypertensive disease stage I without any signs of circulatory insufficiency good results were noted after treatment with Matsesta, radon, coniferous-radon and confierous baths in the summer-autumn season, when the patients used sea baths, air or sun-air baths.

The data of mechanocardiography in 96 patients who were given comprehensive treatment (Matsesta, radon, coniferous-radon baths and climatic treatment) showed a reduction of the systolic blood pressure in 60 patients by an average of 14 millimeters of mercury; the lateral systolic pressure dropped in 58 by an average of 13 millimeters; the mean systolic pressure dropped in 53 by 14 millimeters; the diastolic, in 50 by 11 millimeters; thepulse pressure, in 50 by 10 millimeters; the stroke pressure, in 50 by an average of six millimeters.

We made mechanocardiographic investigations on the third-fifth day that the patients were in the sanatorium. During this period, and under the influence of rest alone and without balneological procedures, the systolic pressure decreased in 25 percent of the patients; the diastolic, in 15 percent. Along with the reduction in the arterial pressure under the influence of comprehensive treatment a reduction in the pulse rate was noted in 43 out of 96 patients (by an average of nine beats a minute). The rate of propagation of the pulse wave did not change in the majority of patients.

For the purpose of evaluating the functional condition of the cardiovascular system of patients with hypertensive disease changes in the standards of the systolic and minute volumes of the heart under the influence of comprehensive treatment are of great importance. The data of these changes are presented in Table 2.

Table 2

Nature of systolic and minute volumes of the heart before treatment	No of patients	Change in the systolic volume of the heart after treatment			No of patients	Changes in the minute volume of the heart after treatment		
		decrease	unchanged	increase		decrease	unchanged	increase
Decreased.....	44	18	5	21	34	15	1	18
Normal.....	20	11	4	5	8	3	1	4
Increased.....	32	26	1	5	54	37	3	14
Total	96	55	10	31	96	55	5	36

Under the influence of comprehensive treatment a normalization of the circulatory apparatus occurs in the majority of patients with hypertensive disease, which is expressed in a reduction in the increase and an increase in the reduced systolic and minute volumes of the heart. Good results are noted both after treatment with Matsesta and radon and confiferous-radon baths as well as after the combination of them with sea baths, air or air-sun baths.

We made 92 observations in 24 patients on the change in the hemodynamic indices before and 45-60 minutes after taking a single Matsesta-radon, fresh coniferous baths and sea-baths in combination with air or sun-air baths. Twenty-one patients had hypertensive disease stage I and three, stage II; there were 18 who had stable circulatory compensation and six who had circulatory insufficiency, first stage. Sea baths were prescribed for patients with hypertensive disease with the bathing lasting from 3 to 10 minutes; the air baths were given for 60 minutes; the sun baths were given in a dose of 20-30 calories. Usually, the patients took a sea bath on arrival at the beach following a preliminary rest in the shade and took another sea bath before leaving the beach.

In the majority of patients with hypertensive disease following the radon and Matsesta baths as well as after sea baths used in combination with air or sun-air baths the mean diastolic, lateral systolic and systolic blood pressure decreased. This effect was less pronounced after coniferous baths. After balneo-climatic procedures the blood pressure dropped from 5 to 20 millimeters. After sea baths and after the taking of sun-air baths the pulse pressure dropped in 7 of 13 patients, remained unchanged in four and increased in two. We could not find essential difference between the pulse pressure changes in hypertensive disease patients after the effect of Matsesta, radon or coniferous baths. The stroke pressure increased in 7 out of 13 patients after a sea bath, and in 5 out of 11 after Matsesta baths; after radon and coniferous baths it remained unchanged in the majority of cases.

The systolic and minute volumes of the heart decreased in the majority of hypertensive disease patients after they took Matsesta and coniferous baths and in the minority after radon baths; after sea baths and the taking of air or sun-air baths the systolic and minute volumes of the heart decreased in half of the patients and increased in half of the patients. The systolic volume of the heart decreased from 15 to 25 cubic centimeters after Matsesta, radon and coniferous baths; the minute volume, from 400 to 2400 cubic centi-

meters. After taking Matsesta, radon baths and sea baths a slowing of the pulse rate was noted in the majority of patients of from 5 to 20 beats a minute; after coniferous baths it did not change. The slowing of the pulse and decrease in the systolic and minute volumes of the heart which we noted in many patients with hypertensive disease following a Matsesta bath indicates a normalization of the circulation. This effect is less pronounced after the taking of radon and coniferous baths. The systolic and minute volumes of the heart in patients with hypertensive disease increased following sea baths more frequently than following Matsesta, coniferous and radon baths, which indicates an increased amount of work of the heart after these procedures. After Matsesta, radon and coniferous baths the hypertensive disease patients usually noted a sedative effect; in some of them there was drowsiness. Directly after the sea baths the mood of the hypertensive disease patients became more alert and their feeling of well being improved.

As a result of comprehensive treatment a decrease in dyspnea was noted in 65 percent of the hypertensive disease patients; in 90 percent there was a reduction of cardiac pain; in 86 percent, a reduction in irritability; in 88 percent, of headaches; in 95 percent the general condition improved.

Conclusions

1. According to the clinical and mechanocardiographic data comprehensive treatment of hypertensive disease patients under conditions of the Khosta Sanatorium with the use of Matsesta, radon, coniferous-radon, coniferous baths as well as sea baths in combination with air or sun-air baths gives favorable results: all types of blood pressure are reduced in the majority of patients, the circulation becomes normal, and the general condition improves.

2. In patients with hypertensive disease stages I and II with signs of cardiac insufficiency the best results of treatment are observed in the spring-autumn season.

3. In hypertensive disease with signs of chronic coronary insufficiency (with attacks of angina pectoris in the history) radon and coniferous-radon baths are most effective.

4. In patients with hypertensive disease stage I without any signs of circulatory insufficiency good results are observed both after treatment with Matsesta baths and after treatment with radon, coniferous-radon and coniferous baths. Best results are noted in the summer-autumn season.

Treatment of Patients With Hypertensive Disease at the Zvenigorod Rest Home

A. N. Posypkin, Lieutenant Colonel of the Medical Service

A study was made of the results of treatment of 400 patients with hypertensive disease at the rest home "Zvenigorod" according to the case histories for two years. The ages of the patients were 39-68 years; the duration of the disease was from one to 15 years. Acute psychic traumata were noted in the histories of 11 percent of the patients; prolonged or repeated psychic strains, in 81 percent; and the hypertension occurred against the background of the menopause in eight percent of the patients. Forty percent of the patients had the first stage of the disease; 60 percent the second.

At the time of admission many patients complained of headaches, dizziness, heaviness in the head, a decrease in the memory, irritability, sleep disorder, tachycardia, pains in the heart area and shortness of breath. On examination of the patients a dilatation of the heart to the left was noted with a muffling of the heart sounds, a sluggish pulsation of the heart, a widening and thickening of the aorta with accentuation of the second sound over the aorta; on the electrocardiogram there was a left axis deviation, a change in the waves, and a disturbance in conduction. An arteriosclerotic process was found in the majority of cases in the second stage of the disease. In half of the patients with this stage of the disease there was obesity. In many an increased viscosity was observed in the blood.

The main objective sign of the disease in all the patients at the time of admission to the rest home was an increased blood pressure, both systolic and diastolic. A systolic pressure of 140-159 millimeters was observed in 30 percent of the patients; 160-199 millimeters, in 55 percent; 200 and over, in 15 percent; the diastolic pressure of 85-89 millimeters was observed in 11 percent; of 90-99 millimeters, in 34 percent; of 100 or more, in 55 percent of the patients. Higher figures of blood pressure were noted in patients with the second stage of the disease and with associated arteriosclerosis and obesity.

We attempted to achieve results in treatment by using a purposeful, physiologically rounded and comprehensive etiopathogenetic therapy in an individual approach to the patient. The principal attention was given to climatotherapy in a picturesque locality, the combination of therapeutic physical culture with rest in the open air, therapeutic nutrition, cul-

turally organized leisure time, and psychotherapy. Where necessary, physiotherapy and drugs were prescribed.

Climatotherapy and a sanatorium routine exerted a favorable effect as early as thefirst two days of being in the rest home: the blood pressure dropped, and the feeling of well being improved.

The combination of therapeutic physical culture sessions in the clinic consisted chiefly of free movement with a subsequent shift to exercises with a medicine ball; a protective then a tonicizing routine of physical activity and terrain cure, were prescribed, and games of croquet and bowling were permitted. In the winter time, short ski trips on level ground and trips on ice-skates at an even skating tempo were recommended; in the summer time in good weather, trips on small boats on the river were recommended and also the catching of fish with fishing rods. Each patient occupied himself in morning hygienic gymnastics, most often as an individual matter.

Therapeutic nutrition was prescribed, in addition to the medical indications, also with consideration of the taste and habits of the patient, and the routine of physical activity. Patients of excessive weight were given a number eight diet with two days off the diet during the course of treatment. Recently, we have begun to use two pairs of days off the diet, that is, two days in the first half of the course and two days in the second half.

With respect to various patients we used methods of psychotherapy. During the course of the treatment it was often possible to convince patients of the lack of necessity of using simply drugs for eliminating the unpleasant symptoms of the disease. This persuasion was reinforced by effect treatment of the patient at the rest home using natural therapeutic factors. Of the physiotherapeutic methods use was made of diathermy, ultra-violet irradiation, coniferous, salt-coniferous, radon, aero-hydromassage baths, various showers and massage. Of the drugs, when the use of them could not be circumvented, hypotensive, spasmolytic agents, vitamin therapy and rarely supportive therapy were used. It was forbidden for the patients to smoke or to use alcohol.

The results of treatment were evaluated according to the general health conditions of the patient at the time of discharge. Improvement was observed in 89.5 percent of the patients; 10.0 percent were discharged without change; 0.5 percent were discharged with improvement. The percentage of patients in whom the blood pressure dropped is shown in the Table.

stage of hypertensive disease	number of patients	systolic pressure		diastolic pressure	
		dropped	those in whom it became normal	dropped	those in whom it became normal
		number of patients in percentages			
I	160	91	63	88	61
II	240	82	8	77	6

The viscocity of the blood at the end of treatment in 68 percent of the patients dropped to normal figures. In 58 percent, the red blood count increased; in 69 percent, the quantity of hemoglobin in the blood increased.

For the purpose of studying the late results of treatment we analyzed the medical records of 108 patients who had previously been treated in the rest home and compared the blood pressure noted at the time of discharge from the rest home with the pressure one, three, six, twelve months after discharge. The blood pressure at these times was almost the same, but in the majority of patients it increased after discharge; in 20 percent of the patients, it decreased; the systolic pressure did not change in 10 percent; the diastolic pressure did not change in 20 percent of the patients. At the same time, with the increase in the pressure a worsening of the general condition occurred, and complaints recurred which had troubled the patients before admission to the rest home.

Conclusions

1. Treatment of patients with hypertensive disease in the first and second stages at the Zvenigorod Rest Home is indicated in all seasons of the year.

2. The comprehensive protective-stimulating therapy and a sanatorium routine with the use of natural therapeutic factors are most effective.

Physiological-Biochemical Basis of Proper Nutrition Under Conditions of Neuropsychic Strain

Professor V. M. Vasyutochkin, Colonel of the Medical Service

Through the many years of work of the Institute of Nutrition of the Academy of Medical Sciences USSR (O. P. Molchanova and her coworkers) nutritional standards have been worked out for different population groups in the Soviet Union. As is well known, these standards are differentiated depending on the arduousness of the physical work and depending on the energy losses of the body in accomplishing one kind of work or another. However, under modern conditions of the extensive development of mechanization and automation, when the boundaries between mental and physical work have been erased, the question of the requirement for the basic food substances should be re-examined.

In a report to the Twenty-First Congress of the Communist Party of the Soviet Union N. S. Khrushchev said: "in a socialistic society automation has not only an economic but also a great social significance. In the process of automation the nature of work is radically changed, the cultural-technical level of the workers is increased, and conditions are created for the elimination of the difference between mental and physical work".

Under these conditions, not only physical work and the energy losses associated with it are of decisive importance for the determination of their requirement for food substances but also neuropsychic strain.

The need for re-examination of the standards of requirements of the basic food substances is determined by a change in the nature of work and by progress in the development of the national economy of the Soviet Union. On the basis of the decisions of the Twenty-First Congress of the Communist Party of the Soviet Union the problem of marked increase in the production of food products is being successfully solved in the Soviet Union. A complete solution of the problem of nutrition of the population on the basis of physiological requirements, which assure the optimum working capacity and development of the body, is possible only under the conditions of a socialistic society. All these problems give rise to the need for a proper solution to the methodology of working out optimum nutritional standards.

Existing methods of evaluating the completeness of nutrition give us an answer to what the nutrition should be above some lower limit, below which a loss of weight, decrease in working capacity, increase in morbidity rate, ap-

pearance of various signs of food deficiency, disturbance in metabolism, etc. occur rather than what the optimum standards should be. In connection with what has been stated the question arises as to what the optimum rations should be for those groups in whom the physical activity is most closely associated with intense neuropsychic activity. What should the food rations be for certain groups who by the nature of their work are frequently under conditions of neuropsychic strain?

In a number of her speeches and articles O. P. Molchanova has repeatedly mentioned that intense mental work requires a qualitatively different nutrition, specifically an increased quantity of proteins compared with ordinary physical activity. These correct statements by O. P. Molchanova, however, proved to be inadequately developed from the point of view of a study of the physiologic mechanisms of increase in the nitrogen metabolism during intense neuropsychic activity.

In order to solve the problem of the qualitative characteristics of nutrition under conditions of strenuous physical work and neuropsychic activity the main requirement is that observations be made on people under specific conditions of their work activity. Observations on experimental animals, particularly on rats, which have been most extensively utilized for experiments on nutrition, are absolutely unsuitable for this situation.

How is the problem of optimum nutrition solved in practice for groups who carry on strenuous work associated not only with muscular but also with neuropsychic activity?

Fundamentally, there is only one, far from accurate means of solving this problem -- the method of maximum, excessive nutrition, taking into consideration the Foytovskiy principle: "Instinct and appetite make it possible for the body itself to solve the problem of the assortment of food products which it needs most". However, food rations with a high content of proteins, fats, carbohydrates, with a high calorie count and ordinary interrelationship of them (14 percent proteins, 30 percent fats, 56 percent carbohydrates with respect to the total calorie count) may prove to be injustified in work which is associated with considerable neuropsychic strain.

During recent years in our laboratory we have examined the condition of the food status (in the broad sense) of several thousand healthy normal people. The examination was carried out according to a definite plan.

Plan of Comprehensive Examination

1. Content in food rations: of proteins, fats, carbohydrates, vitamins: A, C, B_1, B_2, PP, calorie count of the food rations; edibility of the food; organization of nutrition.

2. Physical development, medical examination, signs of food deficiency: pericorneal injection, cheilosis, glossitis, bleeding tendency of the gums, folliculitis, hyperkeratosis. The functional state of the central nervous system (determined by the method of adequate optic chronaxie). Dynamometry with dosaged work.

3. Basal metabolism; energy losses with dosaged work. Blood analysis : vitamin A, alkaline phosphatase (D), vitamin C.

Analysis of the 24-hour urine: total nitrogen, amino acid nitrogen, creatinine, creatinine coefficient, urea. Vitamins: C, B_1, B_2, PP and B_6. Acetone, organic acids, oxygen combining power, chlorides, and phosphates.

As a result of the study of the food status of healthy persons who were on different diets, we came to the conclusion that excessive nutrition, in a caloric respect, exceeding the energy losses of the body is incorrect.

In Fig. 1 data are presented concerning the condition of protein metabolism in two groups of healthy persons. Group A received a diet with a high calorie count -- 5300 calories: proteins -- 176.0 grams (14 percent); fats -- 168.0 grams (30 percent) and carbohydrates -- 734.0 grams (56 percent) a day. Group B was on a diet containing fewer calories -- 3440 calories: proteins -- 102.0 grams (13 percent); fats -- 69.0 (19 percent) and carbohydrates -- 571.0 (68 percent) a day. The average body weight in the first group was 70 kilograms; in the second group, 63 kilograms.

In each group the observation was made on several hundreds of persons. During the observation the weight of the subjects did not change, which spoke for the satisfaction of the main energy requirements of the body.

On the Figure it is seen that in group A a higher level of 24-hour excretion of crestinine and of amino acids and a smaller percentage of reduction of the figures for these components of the protein metabolism are noted than in group B. However, in calculating the intake and assimilation of protein according to the data of the urinary nitrogen a considerable difference is obtained in the quantity of assimilated protein in these groups.

In group B with a low concentration of protein in the diet, according to the data of analysis of the food proteins

and according to data calculated for the excretion of nitrogen in the urine for 24 hours, almost all the proteins in the diet are assimilated by the body (98 percent of assimilable proteins).

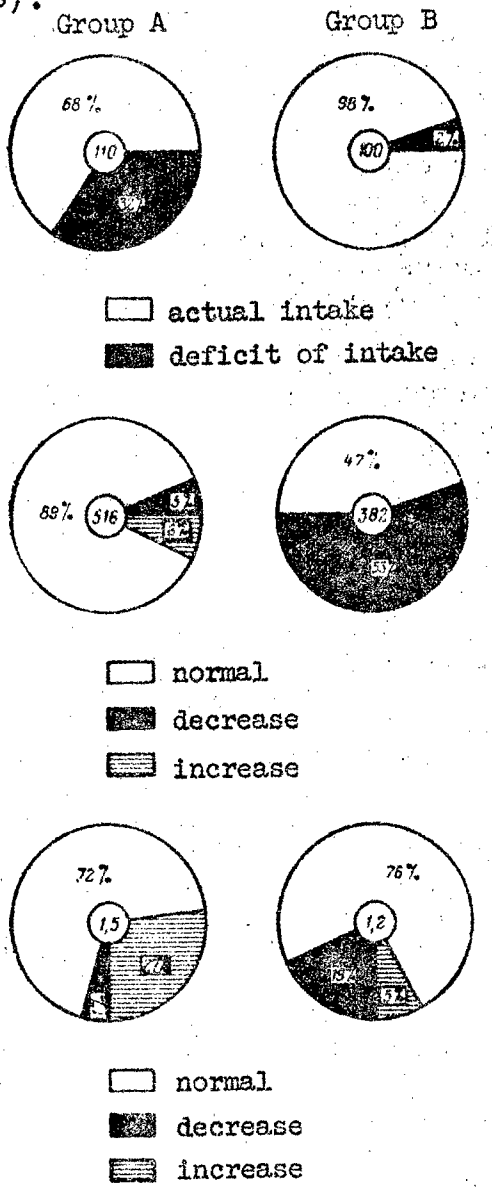


Fig. 1

The first diagrams show the intake of protein calculated by the volume of nitrogen in the 24-hour urine; the second diagrams, the excretion of amino acids in milligrams of nitrogen per 24 hours; third -- creatinine in grams per 24 hours.

In group A, which was on a diet containing a high

protein concentration (according to the data of the same examinations used in group B), the body assimilates a total of 110 out of the 176 grams of protein. Therefore, about one-third of the proteins contained in the diet is not taken up by the body, and these proteins remain in the form of unconsumed food. Does this mean that in a strenuous neuropsychic activity 110 grams of protein a day are adequate? Certainly not. These data speak for the fact that an intake of food substances which is excessive compared with the energy requirements of the body leads to a refusal of food (V. N. Chernigovskiy and coworkers) by stimulating the receptors of the gastrointestinal tract and the receptor apparatus of the blood stream. In our case this was confirmed by the abundance of food residues in group A and the complete absence of residues in group B (N. N. Krylova).

The danger of an excessive diet does not consist in the abundance of food residues but rather in the fact that by covering up its energy requirements through the ingestion of so-called "empty" calories the body does not take in the more valuable food factors -- proteins and vitamins.

For the purpose of a scientific solution of the problem of theproper interrelationship between the various food substances in the diet for groups whose work is associated with strenuous neuropsychic activity the many-hears' work of the Canadian scientist Selye on the problem of the nature of physiologic stress is interesting. As is well known, selye believes that the body responds with a general adaptation syndrome to various physiologic and pathogenic stimuli (heat, cold, radiant energy, mechanical trauma, infection, etc.); here, the increase in hormonal function of the anterior lobe of the hypophysis and of the cortical layer of the suprarenals is of decisive importance. To be sure, participation of hormones in the general adaptation syndrome of the body can hardly be disrupted. However, undoubtedly, in the changes of the hormonal functions in the human and animal body a decisive part is played by the central nervous system. Of the various phenomena of the adaptation syndrome, according to Selye, the metabolic changes which occur under the influence of the corticosteroids, specifically, an increased excretion of potassium, retention of water and chlorides, increase in the carbohydrate and protein metabolism, are of interest to us.

On the basis of data in the literature it may be considered that an increase in protein metabolism under the effect of corticosteroids, from strenuous neuropsychic activity is not associated with an increase in the decomposition of protein substances but rather with a disturbance in protein

synthesis. Thus, the Rumanian investigator, E. Maftey, in experiments with tagged nitrogen showed that in overheating of the body a disturbance in protein synthesis occurs rather than an increase in the breakdown of proteins, which leads to an increased excretion of products of nitrogen metabolism. Interesting observations have been made with tagged nitrogen by Heilskov, Schonheider and Olesen. In the investigation of a man whose entire body was enclosed in a plaster cast, these authors also noted an increase in nitrogen metabolism because of a disturbance in protein synthesis. In the work of I. Mashek and Gorki from Prague it has been convincingly shown that in patients with chronic pains the development of a negative nitrogen balance is observed which disappears with the elimination of the pain.

In experiments on animals Clark showed that when cortisone is injected into them the animals excrete more and retain less tagged nitrogen in the tissues. All these and a number of other experiments give us the grounds for the belief that under conditions of neuropsychic strain a disturbance in protein synthesis is noted rather than an increase in protein breakdown, which is of definite biologic importance.

How can we represent the change in metabolism from strenuous neuropsychic activity?

In certain parts of the cerebral cortex excitation in the presence of strenuous neuropsychic activity is accompanied by an increase in the blood supply, an increase in metabolic processes in a given part of the brain (increased oxygen, glucose, etc. uptake). Simultaneously, through the mediation of acetylcholine an increase occurs in the function of the hypophysis, an excretion of the adrenocorticotropic hormone and an increased excretion of corticosteroids by the cortical layer of the suprarenals occur. An increased excretion of corticosteroids produces an increase in the carbohydrat and protein metabolism in the body. However, the excitation of various parts of the cerebral cortex produces a negative induction in other centers, particularly in the subcortex.

In the work of "A Test of the Physiologic Conception of Hysteria" I. P. Pavlov wrote: "...an alert, active condition of the cerebrum produces a negative induction in the subcortex, that is, it in general restrains its activity, selectively freeing the latter from its work, which is required by the conditions of time and place". The inhibition of processes in the subcortex and the weakening of trophic processes in it causes a weakening of the neurotrophic processes in a number of other parts of the body. For example,

the inhibition of activity of the gastrointestinal tract from strenuous nervous activity is well known. Therefore, an increase in the metabolic processes in the actively working cerebral cortical centers occurs against the background of depression of the trophism in a number of otherparts of the body, and this accompanied by an increase of metabolic products in the blood which can be most effectively utilized by the body in the actively working brain centers. The excretion of corticosteroids from neuropsychic strain leads to an increase in the level of glucose and amino acids in the blood, which in its turn contributes to a greater supply of the working parts of the brain with these substances.

A disturbance of the synthetic processes in the body after arduous, strenuous work has been shown in the observations of L. U. Yu. Oskotskiy with tagged iodine. It was shown that the uptake of tagged iodine in the tissue of the thyroid gland after strenuous work in healthy persons is markedly reduced, which also speaks for a lessening of the synthetic processes in the body.

The disturbance in normal metabolism as a result of strenuous neuropsychic activity applies not only to proteins but also to other substances, particularly to vitamins. In Fig. 2 the results of observations are presented which show that brief but strenuous work (for example, flying) markedly reduces the content of vitamins in the body.

Our statements to the effect that under conditions of neuropsychic strain a depression of nerve trophism occurs in certain organs with a depression of cell respiration -- the principal biochemical substrate of nerve trophism (K. M. Bykov and V. M. Vasyutochkin) are confirmed by the experimental investigations of Tseng Hsiang-yinga, who studied the changes in the reducing power, oxidative power and in the level of vitamin B_1 during overheating, that is, one of the forms of physiological stress.

In Tables 1 and 2 a change is shown in the reducing power, oxidative power and in the level of vitamin B_1 in the tissues of a rabbit during overheating (in percent of control which is taken as 100).

From the data presented it is seen that with overheating a considerable depression of the reducing power is noted (in the cerebral cortex, in the subcortex, in the liver, kidneys, heart and muscles), a somewhat lesser degree of depression of the oxidative power, and a considerable drop in the level of free vitamin B_1. With overheating against the background or radiation sickness the depression of the reducing and oxidative power and the decrease in the vitamin B_1 level becomes much more pronounced. The use of a complex

of vitamins of the B_1 group before the overheating, which normalizes the neural trophism of the body, produces a marked improvement in the reducing power, a considerable increase in the total and free vitamin B_1 and is not accompanied by any changes in the oxidative power of the tissues. Therefore, it has been shown in these experiments that with overheating we actually have a depression of the processes of cell respiration and nerve trophism in certain organs.

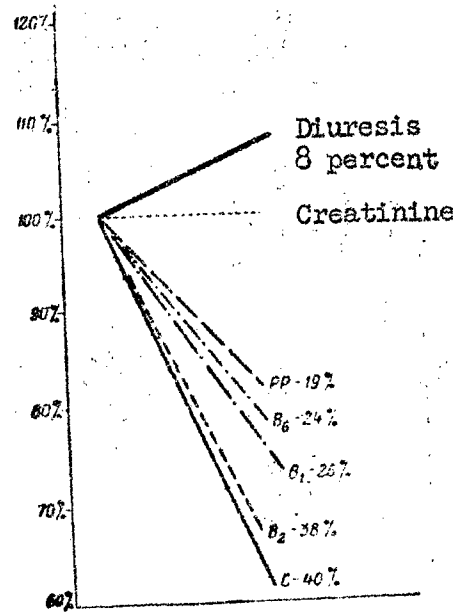


Fig. 2

Table 1

Tissue, organ	reducing power under conditions of			oxidative power under conditions of		
	overheating	overheating and X-irradiation	overheating and ingestion of vitamin B_1	overheating	overheating and X-irradiation	overheating and ingestion of vitamin B_1
Cortex...	-19	-34	+ 5	- 9	-16	none
Subcortex	-16	-42	+12	- 6	-18	none
Liver....	-33	-47	+17	- 7	-18	none
Kidney...	- 7	+12	+20	-14	- 6	none
Heart....	-36	-48	+25	-11	-13	+8
Muscles..	-16	-48	+ 6	- 5	-12	none

Table 2

Tissue, organ	Level of vitamin B_1								
	free			total			combined		
	overheating	overheating at X-irradiation	overheating and ingestion of vitamin B_1	overheating	overheating at X-irradiation	overheating and ingestion of vitamin B_1	overheating	overheating at X-irradiation	overheating and ingestion of vitamin B_1
Brain.....	-22	-35	+ 14	none	-26	none	none	-24	none
Liver.....	-37	-23	+762	none	-21	+107	+ 7	-21	+31
Kidney.....	- 5	- 6	+524	none	-14	+ 45	none	-14	- 7
Heart.....	-29	-31	+714	+12	none	+ 71	+16	none	+27

Note. The air temperature of the chamber was 48-50°; the duration of the heating was 60-90 minutes; the average body temperature was 3-4°. The dose of X-rays was 300 r; the drop in white blood count was 36 percent on the seventh day of irradiation. The dose of vitamins ingested during the hour before overheating: B_1 -- two milligrams; B_2 -- two milligrams; B_6 -- two milligrams, paraaminobenzoic acid -- two milligrams, pantothenic acid -- two milligrams, B_{12} -- 10 gamma, nicotinic acid -- two milligrams.

Based on observations on people and experiments on animals the conclusion may be drawn that under conditions of neuropsychic strain, where the processes of synthesis are disturbed in a number of organs against the background of depression of nerve trophism, the food should primarily be rich in vitamins, particularly in vitamins of the B group.

Our laboratory has made a large number of observations (F. I. Komarov, Ye. P. Pobol', L. A. Andreyeva) in which we noted the favorable effect of vitamins of the B group in many types of neuropsychic strain. Therefore, we believe it extremely essential under conditions of strenuous physical or neuropsychic activity to increase the ingestion of all the vitamins of the B group into the body: B_1, B_2, PP, B_6, paraaminobenzoic acid, folic acid, pantothenic acid, B_{12} and choline as well as vitamin C. However, the ingestion of some vitamins will be definitely inadequate. Under conditions of a lessening of the synthetic processes the organism must be supplied with fewer "empty," simply energy-producing calories, and it should be supplied with essential amino acids, fatty acids, certain trace elements, by the same token increasing the quantity of the so-called "protective" substances in the food.

Taking into consideration the fact that an excessive supply of calories may lead to a reduction in the intake of the "protective" food factors, it is essential that the calorie count of the food correspond to the energy losses of the body and that it should not exceed them by too much. The interrelationship of the food substances should be changed with respect to the increase in the proportion of complete proteins, complete fats and the high concentration of vitamins. For groups in which the physical activity is associated with considerable neuropsychic strain, the proportion of protein calories should be increased but only through the use of complete proteins. If under these conditions of work the food should contain more "protective" factors it should certainly be taken into consideration that for different types of neuropsychic strain different qualities of food may be required. For example, an abundant fat diet reduces the body's susceptibility to cyanides, bur increases its sensitivity to trinitrotoluol. Therefore, for solving the problem of optimum food rations under conditions of considerable neuropsychic strain further investigations are needed of the rate of synthetic processes in the body, the changes in the level of the blood amino acids, and the intensity of breakdown of different vitamins in the body.

Experience in Medical Control of Water Supply of the Troops Under Conditions of a Hot Climate

P. M. Litvinenko, Lieutenant Colonel of the Medical Service

The characteristics of the field water supply of the troops in mountainous and desert regions of Central Asia are created by the high average yearly temperature, the long hot summer, the low relative humidity, the insufficient quantity of precipitation during the summer, the small number of rivers, lakes and other sources of water, as well as by the increased water requirement of the human body because of the great water losses through increased prespiration. Water supply of the troops under these conditions during field exercises acquires considerable importance for the maintenance of the fighting capacity of the troops.

Taking into consideration the principal characteristics of the climate of Central Asia, the Military Medical Department in 1956 worked out instructions for the prevention of sun stroke and heat exhaustion. According to the instructions it is recommended that water be drunk during rest periods. During short halts, 200-400 grams should be taken; during long halts and during the night's rest period, as needed. In the summer, under the conditions of our military district water is distributed in the following way per person per day (see Table).

Reason for using water	On the march in liters per person	At rest in liters per person
Tea, water supply for canteens.....	4.7	4.3
Taking water with food.....	2.3	2.2
Processing of food products.....	0.2	0.5
Washing mess tins and spoons.....	0.3	0.5
Washing.....	2.5	2.5
General standard for water consumption.....	10.0	10.0

Note. In areas with salt water the fresh water is used only for tea, for filling the canteens and for cooking food. The other requirements are satisfied with the salt water. In the winter, spring and autumn the water requirements are the same as for the standards in the temperate zone.

The medical service, supervising the water supply, should make sure that the troops are supplied with an adequate quantity of good water which completely satisfies the requirements of the GOST [All-Union State Standard].

In the deserts the water of many wells, scores and hundreds of kilometers away from one another, can be utilized only for technical purposes, because it has a high mineral content (8-10 grams/liter of salts). The water of these wells usually contains magnesium and calcium sulfates in large quantities (800-1600 milligrams/liter), which give the water a bitter taste. When people who are unaccustomed to it use such water for drinking they develop gastrointestinal disorders. Therefore, rivers constitute the principal sources of water supply of the troops in the mountain-desert locality, but the water in them is very much contaminated, turbid, and contains a large quantity of suspended and organic substances. River water can not be used for drinking or sanitation-hygienic needs without purification and disinfection. In connection with this, the volume of work which needs to be carried out by the engineering and supply services with respect to obtaining, purifying, disinfecting and preserving water and by the medical service with respect to medical board evaluation has a number of distinguishing features in the tropical regions compared with water supply conditions in the more central areas.

During the period of preparation for field exercises and in accordance with the standard for water consumption provided for a hot climate, a calculation is made of the water requirement for all the troops and technical equipment which are to be used in the exercise. Sanitation and epidemiology detachment specialists in conjunction with representatives of the engineering corps have made an engineering and medical reconnaissance of the sources of water. During the reconnaissance attention was directed to the sanitary-epidemiological condition of the water source area with the aim of excluding sources of disease which might be transmitted through the water.

On the basis of the reconnaissance data practical measures were worked out, places for setting up water supply stations were planned, and methods were outlined for improving the quality and for disinfecting the drinking water.

In waterless areas overflow points or water distribution points were created at places where the day's rest, night's rest or halts were to be made in the desert, to which water was brought from rivers (up to 240 kilometers) and poured into a large vat. In order to reduce the heating of the water the reservoirs were half dug into the ground and

covered over with rush matting; the outside walls of the reservoirs were poured over with water twice a day, which contributed to lowering the water temperature in the reservoirs. For the purpose of preserving water supplies for 7 to 10 days at the water distributing point (which were the only means of water supply) the water was preserved in authorized packing containers or in improvised containers (P. M. Litvinenko, P. P. Aleksandrov, "The Problem of Preserving Water under Conditions of a Hot Climate"."VMZh", No 7, 1957). In connection with the fact that troop operations frequently took place in waterless regions and in various directions the water (or water distribution) points had to be set up in every direction. Furnishing water supply points, improving the quality, disinfecting and chlorinating the water were carried out by the engineer water supply companies.

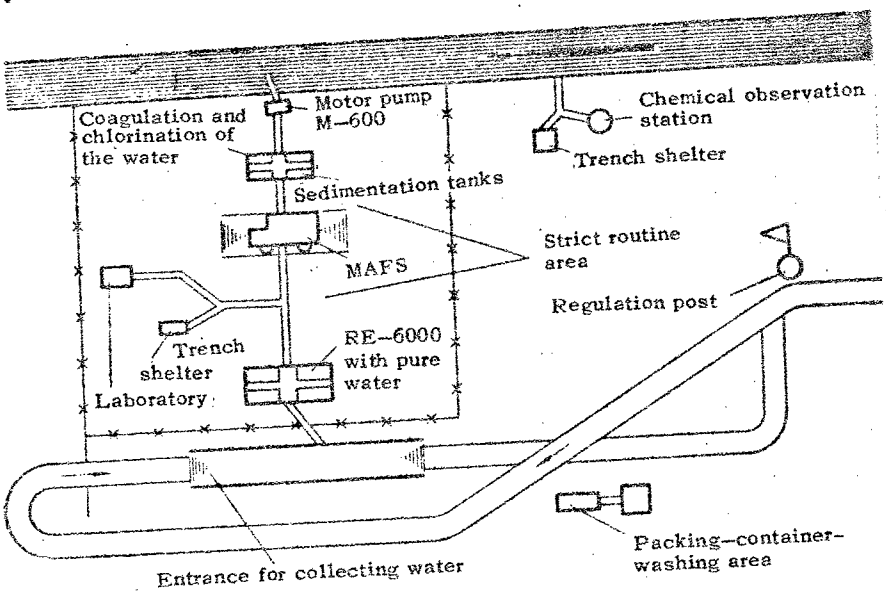


Fig. 1. Diagram of Field Water Supply Point at an Open Water Source.

The water supply points at open water sources usually consisted of trenches for the M-600 motor pumps, two ditches designed for four RE-6000 units for the purpose of coagulating, chlorinating and sedimenting the water, ditches for a mo ernized automatic filtration unit (MAFS), two ditches for four RE-6000 units containing pure water, trenches for the laboratory, an entrance for collecting pure water, a chemical observation station, a packing-container-washing area, a trench shelter for personnel, and places for waiting for transportation. The constituent elements of the water sup-

ply point were concealed and connected with one another by trenches (Fig. 1). The ditches were dug with a bulldozer.

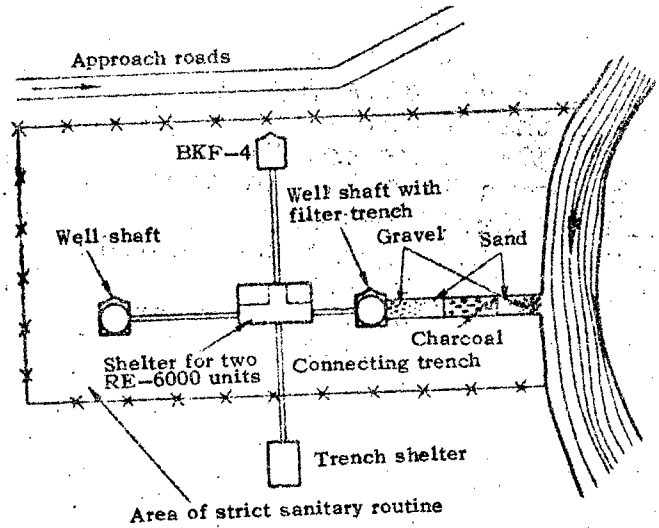


Fig. 2. Diagram of Field Water Supply Point Made of Well Shafts.

The clarified (by coagulation) and disinfected (by chlorination in reservoirs) water was filtered through the MAFS, the automatic filter of which consists of a pressure filter containing a filtration medium made of crushed anthracite and two dechlorinators filled with activated charcoal. The automatic filter output amounts to 7.5 cubic meters per hour. As a result of filtration of the water in the open water bodies turbid water with a grayish-yellow color and a transparency of two or three centimeters and a coli-titer of four to six became colorless with a transparency of 40-50 centimeters and a coli-titer of 210-300. This indicates the good filtering properties of the MAFS. In those cases where there was no MAFS available filtration ditches were made near the open bodies of water by means of a KShK-25 unit, and from these ditches the water was brought to the reservoirs by means of an endless belt mechanism (Fig. 2), where it was chlorinated. After filtration of the water it was fed into reservoirs (RTs-6000) for storage.

In connection with the fact that during the course of transportation and subsequent storage the purified and disinfected water may become contaminated in the reservoirs it is additionally chlorinated after filtration according to the calculation that the residual chlorine in it be 0.5-0.8 milligrams per liter. For the troop units the water is

distributed by tank trucks which are disinfected, no less than once every two days, by means of a hydraulic hose spraying one-percent chloride of lime solution.

Areas of sanitary supervision are set up around the water supply point. A place of collecting water, water purification equipment, reservoirs for coagulation, chlorination and storage of the water and the adjacent territory over a radius of 40-50 meters are included in the strict routine area. This area is fenced off with barbed wire and is guarded 24 hours a day. Restricted areas are established chiefly further up the river. In the restricted area laundering and bathing are prohibited.

At one of the field exercises in an area where there was an insufficient quantity of fresh water a field water supply point was set up with our participation in which salty soil water was collected from a crater produced by explosion and whereby the water was freshened by a mobile salt-water distilling apparatus (POU). In a sandy-desert locality with a high level of salty soil water which lay at a depth of 1.5 meters, we obtained a crater 3.2 meters in depth by sinking a charge of explosive substance weighing 50 kilograms into a bore pit. After 50 minutes, the crater filled up with water, the volume of which amounted to five cubic meters. Pumping the water out revealed that there was a water yield of four cubic meters per hour in the crater. Such a field water supply point consisted of a crater, a packing container for coagulating and sedimenting the water, a mobile salt-water distilling apparatus and containers for pure water. Experience has shown that in a number of cases the water yield in the crater makes it possible to carry out a distillation of it with the mobile (collapsible) salt-water distilling apparatuses. It is possible to freshen the water also by means of the MAFS, in which the reservoirs designed for the dechlorinators are filled with appropriate ion-exchange resins. Water from the crater can be coagulated, sedimented and then freshened. When the water is freshened through the use of ion-exchange resins it must be additionally chlorinated.

Before the field exercises every one who was to work at the water supply points was given an extra examination for bacillary carriage. Persons who had been sick with acute intestinal infections were not allowed to work.

The physicians of the engineer water supply companies at the water supply points determined the necessary quantity of aluminum sulfate for coagulating the water, its chlorine requirement, and they supervised the chlorination of the water and also made checks of the residual chlorine when

water was preserved at water distributing points. The physicians of the engineer water supply companies prepared clarified chlorine of lime solution for the purpose of chlorinating water in the laboratories of the water supply points. Mobile units of the sanitation and epidemiological detachment and PSEO laboratories, to which the physicians of the engineer water supply companies sent water samples, made bacteriological checks of the water.

The experience in medical regulation of the water supply of the troops in field exercises under conditions of a hot climate and of a mountainous-desert locality attests to the fact that with the combined efforts of the engineer and medical corps the problem of supplying the troops with good water can be successfully solved.

The Distribution of Epidermophytosis Among the Personnel and Measures of Prophylaxis for It

G. N. Krivenkov, Captain of the Medical Service
V. N. Koval'chuk, Captain of the Medical Service

The comparatively high percentage of distribution of epidermophytosis with respect to the entire cutaneous morbidity among the personnel as well as the great amount of work lost on account of this disease confront troop physicians with the problem of consistent and persistant relization of more effective measures for controlling epidermophytosis.

In our work we have made an attempt to detect the most frequent sources and means of spread of epidermophytosis among the personnel. For these purposes we have made use of the generally accepted method of bacteriological examinations of environmental objects for fungi by means of culturing the material on Sabouraud's medium.

Sabouraud's medium is prepared on the day before the examination. Instead of maltose double the quantity of natural honey was used, because, in Yu. A. Kozlov's opinion, maltose frequently produces a degenerative growth of the epidermophyton as early as the end of the first week of culture.

Material for the bactieriological culture was obtained by means of washings from environmental objects using sterile cotton tampons which had first been moistened in Sabouraud's medium or in sterile physiological solution. The washings were made from an area of about 100 square centimeters with subsequent culture on the medium. The cultures were kept under thermostat conditions at the optimum growth temperature for the epidermophyton (30-31°) for a week, and then at room temperature (in a thermostat), at a temperature of 22-23° up to one month. The growth was examined at the end of the first week after the culture was made, after two weeks, and after one month. At the time of the initial culture of the material on liquid Sabouraud's medium it was kept in a thermostat at a temperature of 30-31° for five to seven days (before the appearance of a definite growth of the flora). Then, a bacteriological check was made of the growth with simultaneous subculture onto slants of solid Sabouraud's medium.

Chiefly an investigation was made of various articles in the bath houses (benches, shelving, floors, etc.) footwear (the footwear supply, hospital light shoes) and the skin of the feet for the detection of the latent forms of epidermo-

phytosis.

On the basis of the bacteriological and bacterioscopic examination of 242 patients in the hospital who had various diseases, the epidermophyton was found in 142 patients, which amounts to 58.6 percent of all the persons examined. In the clinical examination of this group of patients no signs of epidermophystosis were detected with the exception of a slight peeling of the skin of the feet in two patients. Naturally, with this high a percentage of detection of the epidermophyton in persons who did not have any clinical signs of the disease a massive seedling of various articles and chiefly the floor, screens, shower room benches, the reserve supply of footwear, light hospital shoes, and puttees with the fungus is possible.

We have not found any data concerning the degree of recovery of the epidermophyton from footwear and from puttees in service men in the literature available to us. For the purpose of determining the degree of epidermophyton seeding of the footwear we made a bacteriological examination of the inner surface of 130 pairs of shoes of healthy service men. The epidermophyton was found in 20 cases, which amounts to 15.3 percent of the number examined. The results of the investigation of the wash-room equipment show a high degree of seeding of wooden gratings, benches, shelving and floor with the epidermophyton (see Table 1).

Table 1

Objects investigated	Total examined	Epidermophyton recovered	Other fungus and microflora recovered	No growth found
Gratings (near the benches)	42	25	17	-
Benches	37	13	24	-
Shelving	16	8	7	1
Floor of the undressing room	73	41	31	1
Floor of the wash room	97	52	44	1
Soapy water on the floor	5	1	-	4

The sanitary-hygienic condition of the wash-room at the time of the examination to a considerable degree deter-

mined the degree of seeding of the objects investigated with the epidermophyton and its recoverability. Thus, in one of the wash-rooms where no cleaning or disinfection was accomplished after washing, the epidermophyton was recovered in 84,2 percent of all the cultures during the examination. At the time of a second examination of the same wash-room but after sanitary-hygienic measures were accomplished the recoverability of the fungus amounted to only 8,9 percent. Such variations in the degree of recovery of the epidermophyton depending on the sanitary-hygienic conditions of the object being investigated were found also in other wash-rooms.

Of the various objects which we investigated in the wash-rooms the percentage of recovery of the epidermophyton was particularly high in tests taken from wooden unpainted floors, grating near the benches, the benches, and shelving. Painted gratings near the benches were infested with the fungus half as much as the unpainted gratings. Tile and cement floors also showed a much smaller degree of seeding with the fungus.

For the purpose of disinfecting the wash-rooms we used one to five percent clarified solutions of chloride of lime (with a content of active chlorine from 20 to 25 percent), three-percent lysol solution and two-percent chloramine solution. It was established that three to five percent clarified solutions of chloride of lime have a much less appreciable effect with the same exposure time on unpainted wooden articles than does three-percent lysol solution, whereas in the case of tile and cement floors and walls the chloride of lime solutions have a greater effect than the same lysol solutions.

The results of bacteriological cultures made from various objects in several wash-rooms after treating them with two-three-five percent clarified solutions of chloride of lime or three percent lysol solution with an exposure time of 10-25 minutes and subsequent sanitary-hygienic cleaning are shown in Table 2.

In comparing the results of the recovery of the epidermophyton from various objects in the wash-rooms before and after disinfection (see Tables 1 and 2) the conclusion may be drawn that disinfection in combination with sanitary-hygienic cleaning measures are entirely adequate for tile and cement floors, whereas these measures are insufficient for unpainted wooden objects. Evidently, the shelving and benches should be painted with an oil paint, and instead of wooden screens materials should be used which can be readily disinfected (linoleum or rubber). In addition to the com-

prehensive measures listed above for disinfecting various objects in the wash-rooms we used quartz irradiation with a portable quartz ultra-violet lamp of the PRK-2 type with a capacity of 500 watts. The lamp was set up at a height of 40-50 centimeters above the surface being investigated; the exposure time of the irradiation was equal to 10 and 15 minutes. Of 40 gratings exposed to irradiation with the quartz lamp for 10 minutes the epidermophyton was recovered in 12, and from 20 gratings which were irradiated for 15 minutes, in 10. As might have been expected, the short exposure time of irradiation only stimulated the growth of the epidermophytons, suppressing the foreign saprophytic flora. The same stimulating effect on the growth of the epidermophyton was observed in 213 investigations in which biomycin [aureomycin] (calculating 100 units per cubic centimeter of the medium) was added to Sabouraud's medium.

Table 2

Objects investigated	Total examined	Epidermophyton recovered	Other gungus and microflora recovered	No growth found
Gratings (near the benches)	50	14	31	5
Benches	44	14	27	3
Shelving	16	5	11	-
Floor of the undressing room, wooden	45	19	19	7
Tile	60	7	40	13
Floor of the washroom	147	26	114	7

For the purpose of checking the efficacy of the disinfection treatment of footwear with formalin vapors we made a bacteriological examination of the footwear of patients who were on hospital treatment for the presence of the epidermophyton after a one- or two-day treatment with formalin vapors. The footwear was treated by two methods: cotton balls moistened with pure formalin were inserted into the shoes or the shoes were put into a specially equipped hermetically sealed drawer which was saturated with formalin vapors. Of the 28 cultures made from the footwear treated with formalin vapors the growth of the epidermophyton was found in seven cases after use of the first method. When the footwear was treated in a hermetically sealed drawer the epidermophyton was found in 55 out of 96 cultures. The

greater efficacy of the first method is evidently explained by the effect on the fungi not only of the originally greater concentration of formalin vapors but also by the capacity of the solution for penetrating into the material of the footwear.

Mass Prophylaxis of Epidermophytosis of the Feet

V. I. Zhukov, Colonel of the Medical Service
N. I. Ilyushkin, Lieutenant Colonel of the Medical Service

For the purpose of proper organization of prophylactic work directed at reducing the morbidity from epidermophytosis of the feet we made a study of the causes contributing to its development in military units. An analysis showed that in various small and large units there are certain defects in carrying out the organizational-prophylactic measures: there is no proper control of the sanitary-hygienic state of the wash-rooms and the gyms; the bath-laundry service of the personnel, particularly the laundering of puttees and the regular changing of them on bath days, was not sufficiently well organized. Individual physicians and feldshers do not give the proper attention to the detection and treatment of service men with the latent forms of epidermophytosis of the feet; the latter constitute the source of dissemination of the pathogen, and in a number of cases they produce overt clinical forms of the disease. Persons suffering from hyperhidrosis of the feet, intertrigo, abrasions and particularly onychomycoses are not systematically detected and treated; there is no permanent record nor prophylactic hygienic measures taken for those who have recovered from epidermophytosis of the feet. Sanitation-education work is not at the proper level.

We began to carry out the most active and comprehensive work in prophylaxis of epidermophytosis among the troops in 1954. It was directed at detecting the sources of infection, eliminating the routes of spread of the infection and eliminating the conditions which predisposed to the infection. Considerable attention was directed toward active detection, strict records and vigorous treatment of all patients with pathology of the feet and nails both with clearly overt clinical signs of epidermophytosis and with latent forms of it as well as persons suffering from hyperhidrosis of the feet.

Patients with epidermophytosis and persons suspected of this disease were found at the monthly medical examinations, at the time of physical examinations in the shower room, morning examinations in the large military units, during dispensary examinations of officer personnel, medical examinations of incoming replacements, as well as at the time of admission of the patients to the receiving wards of the hospitals, medical battalions, medical companies and infirmaries.

Under outpatient conditions in our practice of treating those affected by epidermophytosis of the nails of the feet a method has justified itself best which was suggested by S. T. Pavlov. The affected nails are smeared everyday with a lac of the following composition: iodine, 1.5-3.0 grams; salicylic acid, 1.5-3.0; collodion, 30.0 grams. The lac was applied after a hot foot-bath and a careful scraping off of the old layer of the nail. It protected the affected nails against dissemination of the particles, which could have served as a source of infection to those around.

The efficient organization of personnel washing constituted the principal measure among the organizational-prophylactic measures for the elimination of the means of spread of the infection. Particular attention was directed to the sanitation-hygienic routine of the washrooms.

In one of the garrisons the so-called "prophylactic basin-reservoirs" proposed by N. I. Ilyushkin were adopted for mass prophylaxis of epidermophytosis of the feet in 1954. Cement basin-reservoirs measuring 1.3 square meters, 10 centimeters in depth, connected by a drain pipe to the general sewage system (Fig. 2), into which the wash water from the wash-room went, were set up in the garrison wash-room at the entrances to the wash-room and at the exit from it (Fig. 1).

Before wash time the basins were filled with five-percent clarified solution of chloride of lime. The removal of it from the basins was regulated by means of a spigot. Therefore, all the service men passing through the basin reservoirs, which were filled with five percent clarified solution of chloride of lime, were given a double disinfection of the feet -- at the time of entering the wash-room and at the time of leaving it.

According to the data of P. N. Kashkin, the fungi die in several seconds in five-percent chloride of lime solution. Experience has shown that six-percent chloride of lime solution in contact with the skin even for several minutes does not irritate it but only contracts it and dries it.

At the same time, other prophylactic measures were also taken: disinfection of the floor, of the rubber walks (mats), benches and basins with five percent clarified solution of chloride of lime with subsequent washing with boiling water; the wooden gratings in the washrooms were replaced by rubber mats, and the dressing room and undressing room were painted with an oil paint. The regulation of the washing of the personnel was entrusted to a feldsher or sanitation instructor.

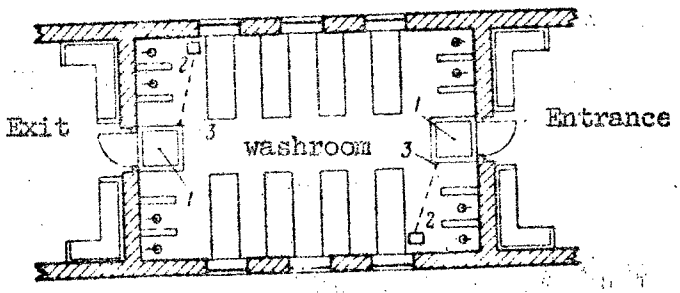


Fig. 1. Diagram of Arrangement of Prophylactic Basin Reservoir in Garrison Washroom:

1 -- basin reservoir; 2 -- sewage system; 3 -- cast-iron spigot with gasket.

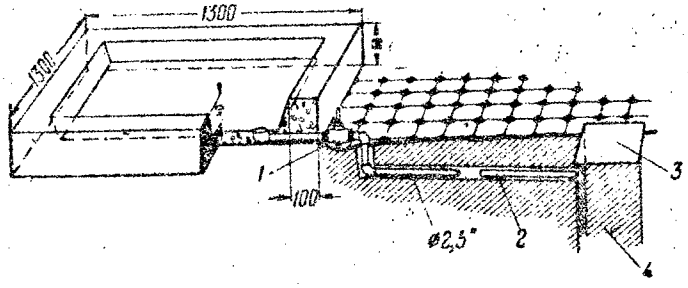


Fig. 2. Prophylactic Basin-Reservoir

1 -- cast-iron spigot with gasket; 2 -- drain pipe; 3 -- square stopcock; 4 -- sewage system.

In the bathrooms and shower-rooms of the hospitals and infirmaries the wooden gratings were replaced with rubber mats. The sanitary-hygienic supervision of the garrison laundries, gyms and barracks was intensified.

After the conclusion of treatment in the hospitals the footwear of every patient was obligatorily disinfected -- until 1957 40-percent formalin solution was used in specail hermetically sealed drawers; since 1957, it has been done by the method of V. M. Leshchenko. In the latter case, the footwear was carefully wiped from inside with cotton tampons which were copiously moistened with a 10-percent aqueous solution of formaldehyde, after which they were wrapped in paper for 30-40 minutes. With the addition of five percent (by weight) chloramine or KhB preparation (parachlorbenzolsulphorchloramide sodium), the exposure time was reduced to 15-20 minutes.

For the purpose of preventing recurrences in all forms of epidermophytosis after cure (of its visible clin-

ical signs) daily prophylactic rubbing of the skin of the soles, lateral margins of the feet and interdigital folds with one-two percent alcoholic solution of iodine with resorcinol with subsequent application of acid powders were used for one to one and a half months. With this aim in view all the persons who had had epidermophytosis were given prescriptions every summer (boric acid and talc in equal quantities).

In the prophylaxis of epidermophytosis the control of perspiration of the feet and of onychomycoses is important. We have successfully used Lyubiyev's ointment in medical installations and in the units for the treatment of hyperhidrosis of the feet, which is of the following composition: formalin 6.0 grams; zinc oxide, 5.0 grams, glycerin, 10.0 grams. The ointment is rubbed in after washing the feet once a day for two to three days straight.

Sanitation-education work has been accomplished by means of giving lectures, talks, radio broadcasts, etc. Service men were taught the routes of penetration of the infections, the need for hygienic maintenance of the feet and proper fitting of shoes.

The following figures attest to the efficacy of the organizational-prophylactic measures for the control of epidermophytosis which have been taken since 1954 in one of the garrisons. If the total number of patients with epidermophytosis recorded in 1952-1958 is taken as 100 in this garrison, then 41.1 cases occurred in 1952, 38.3 in 1953, 10.9 in 1954, 4.5 in 1955, 3.3 in 1956, 1.2 in 1957, and 0.7 in 1958.

In ascribing principal importance to the comprehensive organizational-prophylactic work we set before ourselves the problem of analyzing the efficacy of utilizing basin-reservoirs in the mass prophylaxis of epidermophytosis. Two separate units which had the same census were observed; in three years (from 1954 through 1956) yearly mass medical examinations of the personnel had been accomplished for epidermophytosis in these units. One of these units belonged to a garrison in which a basin-reservoir had been set up; the other, to the neighboring garrison where this method of prophylaxis of epidermophytosis of the feet was not used when the unit personnel washed in the washroom.

If we take the total number of epidermophytosis patients for five years (1952-1956) as 100, then it may be said that 43.4 were recorded in the units of the first garrison in 1952; 40 in 1953; 10.5 in 1954; 4.9 in 1955; and in 1956, 1.2 patients. In the unit of the neighboring garrison, where the prophylactic basin-reservoirs were not used, the number

of patients recorded in 1952 amounted to 23.9; in 1953, 22; in 1954, 18.8; in 1955, 17.3; and in 1956, 18. These data confirmed the indubitable efficacy of basin-reservoirs in the mass prophylaxis of epidermophytosis. They have begun to be adopted actively and constructed also in other garrison washrooms of the district.

As a result of carrying out the entire combination of measures it was possible to reduce the epidermophytosis morbidity rate considerably. Thus, in one garrison in 1958 the morbidity rate with epidermophytosis of the feet dropped by 96.4 percent compared with 1956. In another garrison in 1957 the morbidity rate with epidermophytosis in a calculation per thousand amounted to 11.8; after the measures indicated were performed in 1958 it dropped to 2.3, that is, by five times. In a third garrison in 1953 the epidermophytosis morbidity rate, also in the reckoning per thousand, amounted to 31.7 with considerable work losses in 512.5. In 1956 with the adoption of the combination of prophylactic measures including the prophylactic basins the morbidity rate decreased to 2.1, and the work losses to 23.1.

Practical experience confirms the fact that the accomplishment of comprehensive prophylactic work among the troops sharply reduces the morbidity rate from epidermophytosis. Thus, among the troops of the district in 1958 compared with 1953 the morbidity rate was decreased by 2.5 times and the work losses, by two times.

The prophylactic basin-reservoirs are readily available and highly effective measures for the mass prophylaxis of epidermophytosis of the feet in service men.

Very Simple Method of Microscopic Examination of Skin Peelings and Nails

A. K. Kutsenko, Lieutenant Colonel of the Medical Service, Candidate of Medical Sciences

The early detection of patients with epidermophytosis and of fungus-carriers depends to a considerable degree on the method of taking the material and of microscopic examination of it.

For the purpose of microscopic examination for fungi in mass examinations of the personnel the material (scrapings) should be taken from the interdigital folds of the feet where the initial, latent features of epidermophytosis are most frequent. In the case of involvements of fungous nature the coverings of vesicles or scales or pieces of epidermis with peripheral sections of foci of pathology should be taken for examination. A scraping is made from the affected nails by means of a scalpel, or pieces are cut off the nails with scissors. The pathological material from each person examined is placed in a small paper envelope. In such envelopes material can be kept for a long time and, in addition, they can be sent conveniently to the laboratory.

For the purpose of microscopic examination of the material taken in mass examinations of the personnel of military units and ships with the aim of establishing the actual epidermophytosis morbidity rate, we used the following method. Coverings of vesicles, scales as well as pieces of nails from every subject were taken out of the paper envelops and put into individual test tubes; they were poured over with two-percent solution of potassium hydroxide and left until the following day. At room temperature the material being investigated is macerated after 20-24 hours and is clarified to such an extent that it should be readily examinable under the microscope, even in the case of thick scales or nails, and the mycelial filaments of the fungus are found with low magnification (10 x 8) without a cover-glass. For the purpose of a more careful study of the elements of the fungus the material under investigation is examined under a cover-glass using higher magnification (10 x 40). On microscopic examination for fungi the microscope condenser should be lowered somewhat.

The method of microscopic examination of skin scales and nails for fungi which we are recommending is exceptionally simple and has advantages in the case of mass laboratory examinations. It makes it possible to analyze the material from many subjects and examine a large number of pre-

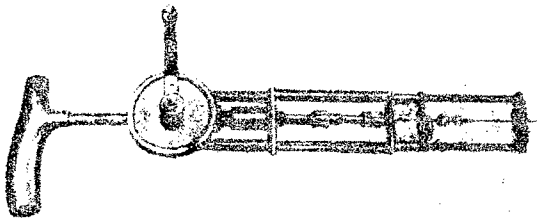
parations without losing time for repeated maceration. The possibility of prolonged preservation of the material in two-percent potassium hydroxide solution (two or three days) enables the unit physician to make microscopic examinations in his free time.

Certain Problems in the Method of Prolonged Intramedullary Drip Infusions

A. B. Rusakov, Major of the Medical Service

We began to use prolonged intramedullary drip infusions in 1953. The most available and convenient place for introducing the needle, we believe, is the metaphysis of the long bones and calcaneus. Usually, the needles were inserted into the upper metaphysis of the tibia. Initially, we made use of the Kassirskiy needle for the infusion. However, we noted that it goes into the bone only superficially, and after puncturing the cortical layer of bone the diameter of the opening frequently becomes wider than the needle, in connection with which the needles which are in the bone for a long time lose their stability, and fluid seeps into the subcutaneous tissue and forms a swelling.

For the purpose of a more stable fixation of the needle and the possibility of introducing it to the necessary depth we designed the so-called "knitting-needle" (see Figure), which has the following characteristics. A special stylet with a plunger and shaft is attached to an ordinary No 15, 17 or 19 needle. The shaft of the stylet is constituted by a portion of a steel pin which is usually used for skeletal traction. On the plunger of the stylet there are two projections which fit into grooves in a needle housing when the stylet is attached to the needle. Such a needle, when inserted into a drill for the purpose of passing the needle through the bone, can be introduced into the bone to any depth. A slot is made in the front strip of metal for the purpose of extracting the needle from the drill.



The needle is inserted by means of an apparatus for bone operations or by means of a small electric motor with a pedal rheostat. This improvement has considerably simplified and accelerated the introduction of the needle into the bone. The needles usually stand firmly in the bone and go into it readily.

On experimental checking it was established that no

seepage of a stained fluid occurs from the bone into the subcutaneous tissue, and for the purpose of extracting the needle from the bone into the subcutaneous tissue, and for the purpose of extracting the needle considerable effort is needed. There were no complications from the injection of the needle.

The rate of infusion of physiologic solution containing five percent glucose solution depends on the height at which the vessel containing the fluid is hung, the width of the needle lumen and the age of the patient. In elderly persons the intramedullery infusions go in more slowly, as a rule, than in young persons. The rate of infusion in them ranges from 5 to 16 drops a minute; in young persons (20-30 years) from 12-60 drops a minute.

Drip infusion of blood and protein-blood substitutes could not be accomplished until we substituted the ordinary system for drip infusions with a system without an instillator, in which the count of the injected quantity of solution is made by means of an air indicator. It was shown that for the purpose of assuring a continuous flow of fluids with their intramedullary injection it is necessary to create a pressure in the fluid column which exceeds the venous pressure of the patient to whom the infusion is being given. It has been established experimentally that raising the container with the fluid one meter over the patient creates a pressure in the column of fluid of 60 millimeters of mercury; at a height of one meter and 25 centimeters, 80 millimeters of mercury; and at a height of 1,5 millimeters, 110 millimeters of nercury. We gave the drip infusion to the majority of the patients patients by raising the container with the fluid to 1,5 meters. In one-third of the patients a retarded influx of fluid was noted during the first few minutes of the infusion. After 15-20 minutes the flow of fluid increased.

The intramedullary infusions were painful. A single injection of one-half to one-percent novocain through the needle which had been injected intramedullary, assures painlessness of the infusion to two hours. Afterwards, repeated injections of novocain are required.

For the purpose of accelerating the injection of large quantities of solutions and of blood intramedullary, F. L. Leont'yev suggested inserting two needles at the same time. We have attempted to use this method twice. Attempts to prepare a needle with several side openings with the aim of utilizing a greater influx of fluid were not crowned with success, because in this case the strength of construction of the needle was reduced considerably and the side openings were plugged by the bone tissue.

In its final form the technique of prolonged intramedullary drip infusion consisted of the following. The site of injection of the needle (metaphysis of the tibia, internal malleolus, inner surface of the calcaneus) was carefully treated twice by smearing it with tincture of iodine, after which the iodine was washed off with a pledget containing alcohol. The needle with a well-fitted stylet was inserted to the bone, and then, by means of pressure and rotary movements with the hand or by means of a hand or electric drill the needle was passed into the spongiosa of the bone to a depth of two to four centimeters. A syringe was attached to the needle, and 15-20 cubic centimeters of one-half to two-percent novocain solution were injected in three portions.

The patient was warned about the possible painfulness of the procedure. Then, a little blood was sucked up into the needle in order to make sure once again that it was in the proper place. The syringe was removed, and an apparatus for drip infusion was attached to the needle without the use of any clamps to stop the flow of fluid. The container with the fluid was raised to a level 1.5 meters above the patient. After 15-20 minutes, when the flow of fluid was established, the necessary rate of injection was regulated by means of an ordinary air indicator. For prolonged infusion a light dressing was applied, and the needle was covered. The part of the rubber tube nearest to the needle was attached firmly to the extremity so that the system could not be disconnected through the patient's movements.

As we noted above, no complications were observed after injection of the needle. With the aim of a control, roentgenograms of a section of the bone into which we had inserted needles were made in various patients 24 hours, three, seven and 14 days after extracting the needle. On X-rays made at the site of injection of the needle up to three days a certain increase was found in the radiolucency (section of rarefaction). After seven and 14 days these changes no longer appeared on the X-ray films.

The negative aspects of the method of intramedullary infusions are obvious: the lack of possibility of a stream administration when it is needed, a certain painfulness at the beginning of the infusion, and the limited possibilities for using it in elderly patients. This, to be sure, narrows the sphere of application of prolonged intramedullary infusions.

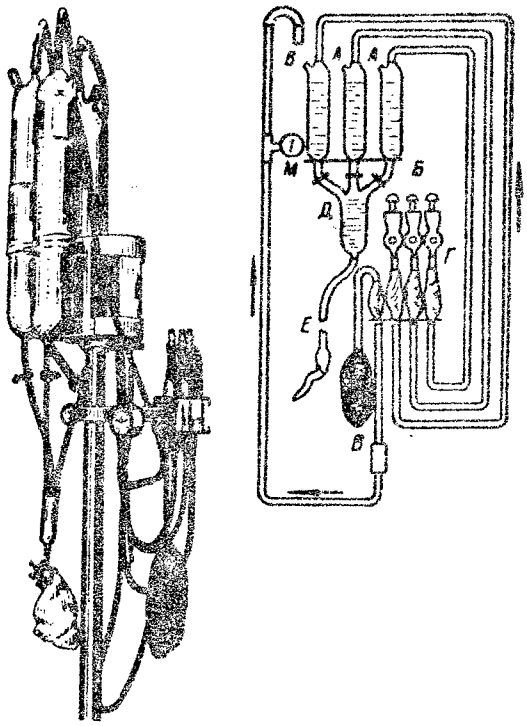
Intramedullary infusions are indicated when there are small or deep veins, thrombosis and obliteration of the veins in extensively affected soft tissues (for example, in

burns) in the newborn and sucklings, in restless and excited patients, where it is necessary to continue the infusion during evacuation (transportation) of a wounded person and where there is a mass influx of patients who need prolonged intravenous drip infusion.

Apparatus for Intravenous Combined Infusions of Plasma-Substitute Solutions

A. S. Agapov

In the Faculty Surgical Hospital imeni Academician N. N. Burdenko, an apparatus which was designed in the hospital for intravenous infusions of solutions under ordinary or increased pressure has been successfully used since 1953; this makes it possible to transfuse protein and synthetic blood-substitute solutions, physiological solution and glucose slowly or in a stream in any combinations.



Appearance of Apparatus for Intravenous Combined Infusions and a Diagram of It:

A -- ampules; B -- air system; C -- increased pressure air system; D -- indicator-filters; E -- mixer-instillator; F -- cannula; M -- manometer.

The apparatus consists of three half-liter ampules (see Fig.) connected to a system which ends in a needle or glass cannula by means of a mixer-instillator and rubber tubes. A stand with two holders (one for ampules, and the other for the glass indicator-filters) serves as the support

for the apparatus. The solutions are poured into the ampules through special openings which are covered with rubber stoppers during operation. The ampules are closed off from the mixer-instillator by Hoffman clamps. The air enters the ampules through rubber tubes made of glass indicator-filters. The quantity and rate of air admitted are regulated by air valves which are set up before the indicator-filters.

For the purpose of intravenous infusion of fluids at a rapid rate, a positive pressure is created in the ampule by a rubber balloon in accordance with manometer readings. The flow of air into the system of rubber tubes under increased pressure is unidirectional (from the balloon to the ampule); a reverse flow of air is prevented by a valve.

Before starting the work the system of rubber tubes and ampules is boiled in a disassembled form in distilled water for 30 minutes after mechanical cleaning; then, it is assembled and sterilized in an autoclave under a pressure of 1.2 atmospheres for 45 minutes. The glass indicator-filters are half-filled with pure alcohol.

The advantages of the apparatus consist in this, that by means of it a continuity in the influx of any interrelationship of solutions to be infused into the patient is achieved; the simplicity of regulating the speed of transfusion of the solutions makes it convenient for the personnel; sealing of the systems keeps the infusion solutions sterile.

Apparatus for Obtaining Soap-Suds

M. N. Nemkin, Lieutenant Colonel of the Medical Service

For the purpose of obtaining soap-suds, an apparatus was designed in our hospital based on the principal of foaming the soap solution with air.

The soap-forming apparatus (Fig. 1) is constituted by a rectangular vat, measuring 12.5 x 7.5 x 5.0 centimeters, with a capacity of 4.5 liters. In the front portion of the vat there is a cupola-shaped elevation for the purpose of collecting the soap-suds from the outlet. The inlet with a sleeve and cover are in the center of the roof of the vat. Tubes come out of the back wall of the vat, drop down to the bottom of it, make a right-angle curve and pass along the bottom to the front wall, where they are attached. The horizontal part of the tube contains small openings throughout.

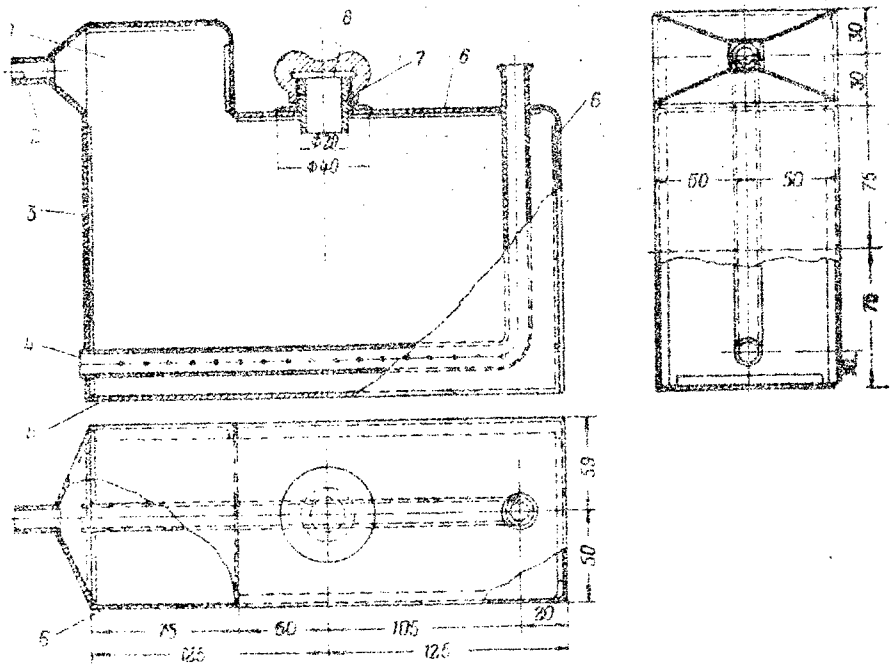


Fig. 1. Diagram of the Soap-Former:

1 -- soap-former; 2 -- outlet, Ø equals 8 mm; 3 -- front plate; 4 -- mixing tube with openings; 5 -- side plates and bottom of vat; 6 -- roof plate; 7 -- inlet sleeve with cover; 8 -- rubber padding.

Soap is formed in the vat in the following way. The

vat is filled with soap solution to 4/5 of its volume, after which its cover is screwed on. Air is forced in continuously through the mixing tube; it leaves through multiple openings and foams the soap solution.

The suds formed accumulate in the cupola-form part of the vat -- the soap-former -- and the air is let out through the outlet and hose.

The creation of a continuous current of air is an inevitable condition for obtaining soap-suds and for its movement through the hose. Any compressor may serve as the source of the current of air. For these purposes we use an automax. After removing the spraying tip and creating a pressure of 1 to 1.5 atmospheres in the automax, which is afterwards maintained at this level, a strong stream of air is obtained which provides a uniform abundant outflow of suds.

For the purpose of cleaning the air which enters the vat, we have used a water filter consisting of a double-necked Wolf flask filled with water or antiseptic solution to one-third of its volume. A tube is inserted into the inlet; the lower end of the tube is dropped into the water, and the other end is connected to the automax hose by means of a rubber tube. A glass tube of smaller diameter is inserted into the second opening of the flask; it is connected with the mixing tube of the soap-former.

All the parts are placed on a special stand (Fig. 2), which consists of a support and a column onto which a movable table is attached by means of a slitted block. The soap-former and the water filter are set up on this table. In addition, the metal part of the automax hose is attached to the edge of the table. A "crib" is attached to the top of the column for the two two-liter bottles with tubes at the bottom. The first bottle contains soap solution and is connected with the inlet of the soap-former by means of a rubber hose. By means of a stopcock, the vat is filled through this hose as the soap-suds are used up. Sterile physiological solution is contained in the second bottle; the solution passes by gravity through the hose attached to the bottom of the bottle and is used for irrigating the treated surface and washing it with soap-suds.

The stand is collapsible (Fig. 3); it can be arranged in a single pack with all its devices. The column consists of three parts, each of which screws into the other. The support, table and crib are also detachable.

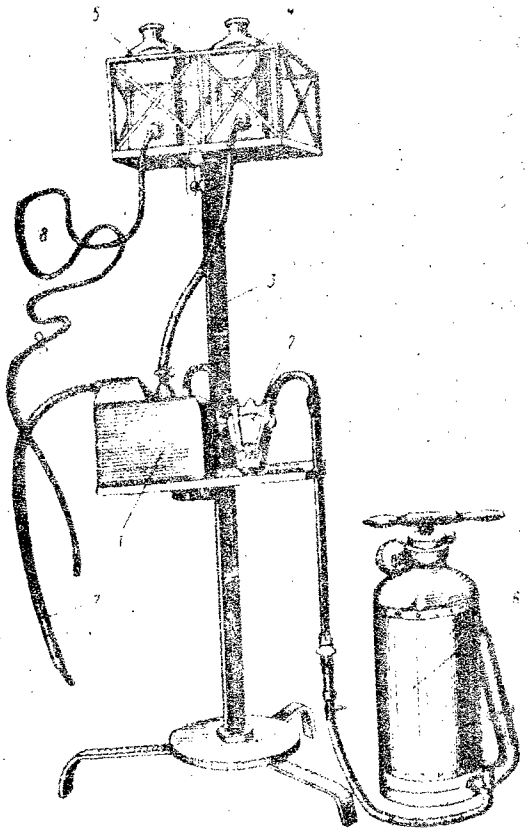


Fig. 2. General Appearance:
1 -- soap-former; 2 -- water filter; 3 -- stand; 4 -- flask with soap solution; 5 -- flask with physiological solution; 6 -- automax; 7 -- hose for soap-suds; 8 -- hose for physiological solution.

For the purpose of obtaining soap-suds we have used four-percent soap solution made from fresh boiled water and commercial soap or powdered soap, or kern soap (72 percent). More copious suds are obtained through the use of the last two wetting agents. The soap solution prepared in this manner in a sterile vessel does not need to be sterilized. We have made cultures of the soap solution on sugar bouillon with subsequent subculture onto solid media; there was no microbial growth after three days.

The flasks, hoses, soap-former and water filter should be sterilized in the autoclave or by boiling. The field set-up suggested for soap-sud processing is suitable for mass treatment of the afflicted [a general term which includes, in addition to ordinary injuries, those affected by radioactive substances, war gases, bacterial weapons, etc.].

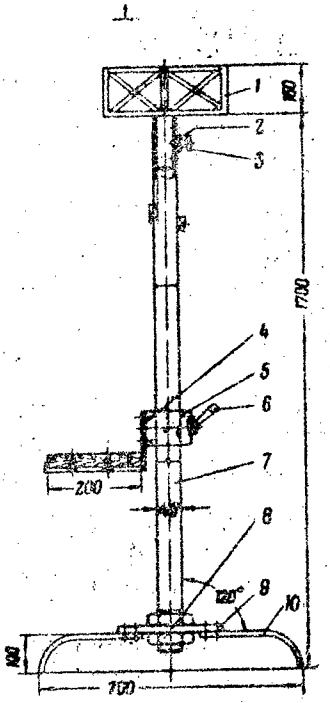


Fig. 3. Diagram of Stand:

1 -- crib for bottles; 2 -- rod for attachment of crib; 3 -- bolt for attachment of crib; 4 -- plank for attachment of table; 5 -- slitted block for attachment of table to the stand; 6 -- handle of block; 7 -- column of stand; 8 -- nut for attachment of column and stand; 9 -- base-plate of stand; 10 -- pedestal of stand.

Abstracts

M. I. Beznosov, Colonel of the Medical Service -- The Results of Treating Patients With Arteriosclerotic Myocardial Fibrosis at the Sochi-Matsesta Health Resort.

At the Sochi-Matsesta Health Resort three therapeutic methods have been successfully used in the comprehensive treatment of patients with cardiovascular diseases: Matsesta baths in combination with sea baths; sea baths without Matsesta baths; Matsesta baths without sea baths.

The observation was made on 170 patients with arteriosclerotic myocardial fibrosis, in whom, in addition, the effect of the sea baths was studied according to the data of electrocardiography directly on the beach. In all, 571 electrocardiographic examinations were made. A study was made of the data of the late results of treatment in 158 patients who were in the sanatorium for a second time. The efficacy of treatment at different seasons of the year was also studied.

As a result of the comprehensive treatment, 39.4 percent were discharged with considerable improvement; 59.8 percent improved; 0.8 percent unchanged. According to the data of repeated and prolonged observations, the therapeutic effect was maintained up to five months in 11 percent; from six to nine months, in 39 percent; over ten months, in 50 percent.

A study of the dynamics of the electrocardiograms taken before and after bathing increased the diagnostic value of this method, particularly in studying the S-T interval, which characterizes the blood supply of the myocardium. This study makes it possible to gain an idea of the condition of the contractile function of the myocardium and to demonstrate a relative disturbance in the coronary circulation in cases where the electrocardiogram taken at rest does not show any changes. The dynamics of the clinical-electrocardiographic indices under the influence of sea baths makes it possible to evaluate the adequacy of physical exercise in sea baths in dosages used and to consider these changes a reflection of the slight physiological changes in the functional state of the myocardium. Study of the dynamics of the S-T interval after sea baths in patients with arteriosclerotic myocardial fibrosis and in healthy persons gives us the grounds for explaining the displacement of it by means of an increase in the stroke volume of the heart and an increase in the frequency and, therefore, to consider them a manifestation of the general physiological reaction

of the body to sea baths rather than an ischemic condition of the heart muscle.

Best results of treating patients with arteriosclerotic myocardial fibrosis at the Sochi-Matsesta Health Resort are observed in the summer-autumn season of the year. The efficacy of treatment during the summer is greater when the Matsesta baths are used in combination with sea baths; at other seasons of the year, with the use of Matsesta baths. The former is the more effective therapeutic combination, in which the main therapeutic factors are the Matsesta baths in combination with the sea baths.

N. A. Nosov, Colonel of the Medical Service -- Certain Characteristics of the Course of Hypertensive Disease at the Kislovodsk Health Resort.

For purposes of refining the indications for hypertensive disease in patients staying at Kislovodsk Health Resort, observations were made on the blood pressure dynamics in patients throughout the course of sanitorium-health resort treatment. The time of treatment of the patient was divided into three periods: the first period, the pre-balneological, which lasted five-six days, a period of relative physical and mental rest; the second period -- 12-14 days -- a period of active use of comprehensive therapy (narsan [mineral water containing sodium carbonate, sodium chloride, carbon dioxide and hydrogen sulfide] baths at 35-33°, lasting 5-12 minutes, 10-12 baths per course; dosaged therapeutic walks along definite routes, physiotherapy, therapeutic gymnastics, medical diet); third period -- the concluding period.

The observation was made on 250 patients with hypertensive disease. The age of the majority of the patients was 40-60 years. The length of the disease was five and seven years. The first stages of the disease was present in 80.1 percent; the second, in 19.9 percent.

During the first period, the blood pressure dropped by 10-25 millimeters systolic and 5-10 millimeters diastolic in 90.7 percent; the general feeling of well-being improved. However, in 10 percent of the patients (usually those with stage II hypertensive disease) a negative reaction was observed during this period. In six percent, the blood pressure increased by 15-30 millimeters systolic and 10-15 millimeters diastolic; in some of them the rise in blood pressure was accompanied by the development of a vascular crisis of an exacerbation of neuro-vegetative disturbances. In four percent of the patients no changes were noted during this period.

During the period of treatment the patients were given narsan baths at a temperature of 36-33°, lasting 10-12 minutes, therapeutic walks, physiotherapeutic procedures, medical gymnastics, medical diet. During this period, the blood pressure continued to fall in 76.0 percent of the patients, and the general condition improved. In the other 24 percent, the reaction had a different course (principally in patients with the second stage of the disease); in 16 percent of them the blood pressure increased, functional dynamic disturbances of the cerebral, coronary circulation were observed or there was an increase in the neurovegetative disorders. In the other eight percent, the blood pressure and subjective state remained unchanged.

Under the influence of sanitorium-health resort treatment, the blood pressure dropped by 10-35 millimeters systolic and 10-15 millimeters diastolic in 85 percent of the patients with simultaneous elimination of cardiovascular and nervous disorders to a greater or lesser degree. Five percent were discharged with a slight increase in blood pressure; ten percent, without change in the blood pressure but with improvement in their subjective state. The decrease of the blood pressure during the course of treatment was expressed distinctly in the group of patients with stage I hyperftensive disease; the decrease was less distinct and sometimes an unfavorable result was noted in the group of patients with stage II disease. Therefore, it may be considered that in hypertensive disease stage II patients should not be sent to Kislovodsk Health Resort.

B. F. Sidorenko, Colonel of the Medical Service -- Treatment of Patients Who Have Had a Gastric Resection at the Pyatigorsk Health Resort.

A total of 129 case histories were studied (in 1948-1957) in patients who had undergone an operation of gastric resection for peptic ulcer and who were treated in the Pyatigorsk Sanitorium.

All the patients were men; there were 39 who were 30-35 years of age; 75, 40-45 years; 12, 50-55 years; and three persons who were older.

The patients arrived in the sanitorium in satisfactory condition. There were 99 persons in whom there was loss of weight (six-seven kilograms below normal); 26, with normal weight; 4 who were overweight (obesity of the first-second degree). The duration of the disease was eight-ten years in 112 patients; three-eight years, in 14; under a year, in three. The patients complained of general weakness, rapid

fatigability, decreased appetite, pains in the epigastrium, belching, nausea, diarrhea, etc.

Treatment was given according to the generally accepted method. As the principal medical combination, 117 patients were given protective fractional diets (Nos 1 and 2 diets), drinking of mineral water, mineral baths, and in certain cases mud applications to the abdomen and lumbar area. In 12 patients, in addition to this treatment, antispasmodics (tiphen [diphenylthioacetic acid 2-diethyl aminoethyl ester], platyphylline, papaverin and others) and replacement therapy (pepsin, pancreatin and others).

One of the indices of success in treatment of patients at the health resort was considered to be a gain in weight. As a result of treatment, 33 persons gained one kilogram in weight; 79, two to three kilograms; 13, four-five kilograms. A decrease in weight was noted in patients who had a disturbed fat metabolism.

A considerable improvement occurred in 118 patients under the influence of treatment (complete disappearance of pains and dyspeptic disorders, disappearance of pains on palpation of the abdominal organs, improvement of the general condition, gain in body weight); in seven, there was improvement; and four persons were discharged unchanged.

N. M. Volokova, Lieutenant Colonel of the Medical Service -- Ephemeral Pulmonary Infiltrates.

Ephemeral infiltrates were observed in 88 patients who were admitted for treatment to the sanitoria; in the majority the infiltrates were accompanied by eosinophilia. The following characteristics in their course were noted. The disease is of a seasonal nature (most often June-September). During the winter period the ephemeral infiltrates are observed rarely. Detection of the ephemeral infiltrates in the patients occurs during the first few days after the patient is admitted to the sanitorium in the majority of cases. This makes it possible to suppose that the majority of infiltrates are a manifestation of an allergic condition of the body which is produced by a reaction to new circumstances, change in climate, etc.

The ephemeral infiltrates were found most often in patients with a labile, weakened nervous system, as well as in persons of the so-called "cabinet worker" type. The patients usually complained of malaise, weakness, irritability, sleep disturbance, occurrence of a dry cough and raspiness in the throat; less often, they noted moderate catarrhal signs of the upper respiratory tract and pains in the chest localized in an area which corresponded to the

existing infiltrate, hives, herpes on the lips, and a skin rash.

The X-ray pictures of the ephemeral infiltrates are various. Usually, the infiltrate was found in the middle and inner zones of the mid-lung field. Not uncommonly, mixed opacities were noted which occupied two lung fields and two zones. The infiltrative opacities in the mid-lung field on the right were usually located near to the front (middle lobe of the lung). On multiaxial examinations of the patient a certain position of the infiltrate shadow was noted.

In size and number these shadowy infiltrates could be divided into groups: large solitary cloud-like infiltrates, large multiple soft mottled infiltrates, solitary small and soft mottled infiltrates. Resorption of the infiltrate occurred as a whole or from the periphery. A salmon-yellow color of the sputum in ephemeral infiltrates of this etiology was not a constant diagnostic feature. With the aim of prophylaxis of the disease, appropriate talks were held with the new arrivals.

B. N. Yanovskiy, Lieutenant Colonel of the Medical Service, Candidate of Medical Sciences, and V. V. Kurylev, Captain of the Medical Service -- The Use of Hypnosis in the Treatment of Neuroses.

The efficacy of hypnosis was checked in the treatment of neuroses. Hypnosis was used by the method of fixing the glance on a shiny metal ball with simultaneous speech reinforcement. After the patient had sunk into a hypnotic sleep suggestion was given. At first, the sessions of therapeutic hypnosis were accomplished every other day; then, twice a week. The majority of patients were given five to ten sessions. The duration of the initial sessions was 20-25 minutes; that of subsequent sessions, 40-60 minutes. In the majority of patients individual treatment was used; sometimes, group sessions of hypnosis (two or three persons at the same time) were given in cases of the same kind of diseases with similar clinical pictures. Treatment with hypnosis was given to 52 patients. Of these, 45 patients were treated on an outpatient basis, and seven in the hospital. The majority of patients (44) had various neuroses (neurasthenia, hysteria, compulsive-obsessive neurosis, post-traumatic cerebrasthenia). Three persons were treated for bronchial asthma. Five patients has neurotrophic disorders (eczema, itching). After treatment with hypnosis the headaches disappeared in 12 out of 44 patients with neuroses, the blood pressure and

sleep became normal, the ability to work was restored; in 21 the feeling of well-being improved; in eight, an insignificant improvement occurred; and in three patients there was no effect from hypnosis treatment.

In patients with bronchial asthma, beneficial results were obtained; in one patient the asthmatic attacks completely disappeared. A complete disappearance of eczema and itching was observed in two out of five patients with neurotrophic disorders; in one patient there was improvement.

G. M. Engin, Guards Major of the Medical Service -- Experimental Psychological Evaluation of the Flight Abilities of Flight Students.

The investigation of attention, memory and motor reactions in two groups of students, each containing 20 persons, is reported. The first, control, group was made up of excellent students; the second group, of students who were not making good progress, and who were afterwards dropped from training because of failure in flight progress.

Attention was investigated by methods of seeking out successive numbers [distribution of attention] and with switching of numbers. In the former case, the average figures for the first group of students were 41.7 seconds; in the second case, 53.5 seconds. In the latter case, for students making successful progress the average number of errors was 3.2 and the time was four minutes and 40 seconds; for those students who were not making satisfactory progress, 5.1 errors and five minutes and 58 seconds. In the examination of intellectual and mechanical memory the difference in the figures of the students in the first and second groups was found to be insignificant.

In the examination of motor reactions by means of the NIIIAM [Scientific Research Testing Institute of Aviation Medicine] apparatus the results made by the poor students were considerably worse than those made by the successful ones. In the simple motor reaction the latent period in 20 examinations was 0.17 second in the successful students and 0.24 second in those who were not successful; the motor period of the reflex was, respectively, 0.15 and 0.21 second; the entire reaction time was 0.32 and 0.45 second.

In the selection reaction the latent period of the successful students was 0.38 second; in those who were making poor progress, 0.45 second; the motor factor was, respectively, 0.21 and 0.26 second; the entire reaction time was 0.59 and 0.71 second; the number of errors in 20 reactions was 1.2 and 2.1.

In the switching reaction the latent period in the

successful students was 0.49 second; in the poor students 0.62 second; the motor factor was, respectively, 0.28 and 0.41 second; the entire reaction time was 0.77 and 1.03 second; the number of errors, 3.6 and 8.4.

In the autotemp [self-timing] reaction in 30 seconds the successful students showed an average of 27 correct and 3 erroneous reactions; the unsuccessful ones, 28 correct and 6 erroneous. In the reaction to a moving object the average deviations of the former were 0.03 second; in the latter, 0.07 second.

An individual evaluation of the results of the tests shows that 95 percent of the successful students showed good and satisfactory results and only 5 percent, unsatisfactory; in the group of poor students, 90 percent showed unsatisfactory results and 10 percent satisfactory.

In the examination of the motor reactions the most important tests are the indices of the selection, switching reactions and the reaction to a moving object. With an average reaction time with selection of more than 0.8 second, the switching reaction more than 0.9 second, and the number of errors in 20 switching reactions more than eight, and the abnormalities in the reaction to the moving object more than 0.07 second -- the results of the investigation should be considered poor.

The abbreviated method of experimental psychological testing presented gives a complete concept of the flight abilities of the persons being examined. Therefore, on accepting candidates into aviation school it is expedient to carry out an experimental psychological examination of them for the purpose of evaluating their flight ability.

N. I. Sheptukhin, Captain of the Medical Service -- Cardiovascular Reaction to a Parachute Jump.

The blood pressure of parachutists was measured, the pulse was counted, the white blood count was checked, and the sedimentation rate tested before being told of forthcoming parachute jumps, before the jumps and after the jumps. For the purpose of study, two groups of parachutists were used: the first group consisted of beginners (48); the second, parachutists who had made 6-12 jumps each (50). Both groups were given a medical examination before the tests. Before being told of forthcoming parachute jumps, the blood pressure in the parachutists of both groups were as follows: systolic, 100-135; diastolic -- 55-75 millimeters of mercury; the pulse was 60-75 beats a minute; the white blood count was 5,600-8,000 per cubic millimeter; the sedimentation rate, 2-5 millimeters in an hour.

After being told of forthcoming parachute jumps, an increase in the systolic pressure was noted in 28 parachutists of the first group by 10-15 millimeters; in 7 parachutists there was a tendency toward a decrease in the diastolic pressure by 5-10 millimeters; the pulse increased in frequency by 8-15 beats a minute. In 16 parachutists only the pulse increased in frequency by 10-15 beats a minute. No changes were noted in the leucocyte count or sedimentation rate. In the second group, the systolic pressure rose insignificantly in 15 parachutists, and the pulse increased in frequency; in nine, only the pulse increased in frequency.

After the parachute jump, the systolic pressure increased by 40-60 millimeters in all subjects. The diastolic pressure had a tendency to decrease chiefly in the second group of subjects; in the first, it increased by 25-35 millimeters. In almost all parachutists of the second group, the arterial pressure returned to the original figures in 1-1.5 hours. In the first group, the recovery of the original value of the blood pressure occurred after two to four hours. In all the subjects, the pulse increased by 50 or more beats a minute, whereby it returned to the original levels much sooner than the arterial pressure -- after 15-30 minutes.

The white blood count rose by 2,500-3,000 compared with the original figures in 90 percent of the parachutists of the first group after the jump; in the second group, by 1,500-2,500 in 75 percent. No changes were noted in the sedimentation rate.

P. M. Suvorov, Captain of the Medical Service -- The Influence of Radial Accelerations on the Activity of the Salivary Glands.

The work was carried out on three dogs in which the parotid ducts had been exteriorized according to the method of D. L. Glinskiy. Along with the recording of the quantity of saliva the activity of the enzyme amylase was investigated. After establishing the background of salivary secretion for 1-1.5 months and after the extinction of extraneous orientative reactions the experiments with the effect of accelerations were begun.

The radial accelerations were created by rotating the animal in a centrifuge with a radius of 3.5 meters. Radial accelerations were used in which the direction of the effect was "head-pelvis" with a magnitude of from three to nine G and with the direction of the "pelvis-head" effect having a value of three to five G. In the former case, the time of the effect was made equal to 20 seconds or one minute; in

the latter, only 20 seconds. Two series of experiments were performed (186 experiments).

In the first series, a study was made of the effect of radial accelerations on the function of the salivary glands of animals at rest; in the second series, the function of the glands during rotation in an active condition. With this aim in view the oral cavity of the dog was irrigated with hydrochloric acid during rotation by means of a specially worked out system.

An analysis of the data of the first and second series of experiments showed that radial accelerations even with values of three G in the direction of "head-pelvis" produce a marked inhibition of the salivary secretion at the time of rotation, which rapidly disappears after the effect of the acceleration. However, with an acceleration of seven G or more lasting 20 seconds the inhibition of the secretion may be observed for 10-15 minutes after the rotation has been stopped. It is particularly pronounced after the effect of radial accelerations in the "pelvis-head" direction, where using five G and a duration of the effect lasting 20 seconds the after-effect lasted up to a day or more. Along with the change in the magnitude of the secretion the appearance of amylase was observed in the saliva. The latter may serve as an index of changes occurring in the trophic processes. It has been shown by certain authors that the appearance of amylase in the saliva is associated not only with the change in the functional state of the higher central nervous system centers but also with changes occurring in the sympathetic innervation of the salivary glands. It may be supposed that under the influence of accelerations these changes are also associated to some degree with the anoxic condition of the central nervous system.

The accumulation of facts on the influence of accelerations and other organs of the gastrointestinal tract makes it possible to analyze the complex nerve-reflex and nerve-humoral mechanism of regulation of the body functions under the influence of radial accelerations.

V. I. Gal'perina -- The Connection of Epidermophytosis With Ear Disease.

Epidermophytosis of the skin of the auditory canals in the presence of epidermophytosis of the feet is a not uncommon phenomenon. With epidermophytosis of the skin of the auditory canals and the aural conchae the discharge has a characteristic odor of intertrigo, which is one of the diagnostic features of this disease.

One hundred and twenty patients with epidermophytosis of the feet and of the skin of the auditory canals were treated. They had all been sent to the ENT clinic with the erroneous diagnosis of chronic purulent otitis media, which was not confirmed.

Treatment of these patients was carried out in the following way: at the time of the first visit, the patient's auditory canal was carefully cleaned out with three-percent hydrogen peroxide. Then the auditory canal was wiped out as far as the ear drum with a cotton tampon moistened in one-percent salicyl alcohol, and the skin was dried out with a sterile cotton ball. The cartilaginous portion of the auditory canal was smeared with sulfosalicylate ointment. On subsequent days the ointment was removed, and the auditory canal was wiped simply with one-percent salicyl alcohol.

Treatment was carried out daily until the skin scales peeled off. Afterwards, the skin of the auditory canals was wiped daily with one-percent tincture of iodine until complete recovery. During the treatment period, the patient was forbidden to wash his ears with water.

With this method of treatment, 107 out of 120 patients recovered completely without any further recurrences; in 13 persons after treatment a relapse of the disease in the feet and in the skin of the auditory canals occurred at various intervals after treatment. These recurrences apparently occurred as the result of incomplete treatment.

N. S. Ozerov, Lieutenant Colonel of the Medical Service -- Method of Removing Corns.

An onion is cut into two parts and peeled in layers. The semi-oval layers obtained, 0.2-0.3 centimeter in thickness are cut into pieces from one to two centimeters in size, are put into a glass jar with a ground stopper and are poured over with acetic acid. The jar is kept in a dark cool place. After two days, the onion may be used for peeling off corns, calluses and warts. Following a hot bath of the foot or hand, a small flap of adhesive plaster is applied for the purpose of protecting the healthy skin in the vicinity of the corn, and in the middle of it a slot is cut corresponding to the size of the corn. Pieces of onion are applied to the corn for 20-22 hours. The onion is carefully fastened tightly with strips of adhesive tape.

The patient is told to stay in bed for 24 hours. After 20-22 hours the dressing is removed, and the onion is removed. Afterwards, every day, beginning with the day of the dressing, hot baths are given for the foot or hand for

five-six days; during this period the spontaneous painless separation of the corn is completed. For the purpose of accelerating this separation, a slit is made into the epidermis with a scalpel on the first or second day at the edge of the corn. The central edge of the incision is grasped with a clamp, pulled and simultaneously rotated around its axis. The epidermis is cut with a scalpel around the corn, which is removed without any effort. The opening formed epithelializes after two or three days.

M. B. Levenson, Major of the Medical Service, Yu. M. Kiselev, Captain of the Medical Service, and G. S. Feoktistov, Captain of the Medical Service -- The Vitamin C Supply of Sailors' Rations on Certain Ships.

A study was made of the content of ascorbic acid in prepared food of sailors' rations depending on its preparation, manner of distribution and preservation. The work was carried out during the winter-spring period on minesweepers and destroyers. The content of ascorbic acid was determined according to instructions of the GVMU MO [Main Military Medical Department of the Ministry of Defense] directly on ships by means of a portable unit.

In the majority of rations investigated, ascorbic acid was found in much smaller quantities than in the 24-hour normal amount for vegetables and for vegetables which have been subjected to processing. The ascorbic acid losses from culinary processing were the same, despite the different conditions or preparation and distribution of the food on certain ships, and amounted, on the average, to 70-72 percent. Such a reduction in the quantity of ascorbic acid is explained by a violation of the rules of culinary processing of vegetables. Thus, when peeled potatoes are kept in water for more than three hours the losses reached 36-40 percent; washing of sauerkraut led to losses of up to 53 percent of the ascorbic acid.

A laboratory check needs to be established on the vitamin supply of the sailors' rations directly on the ships, and the personnel of the ship should be given prophylactic vitaminization in accordance with data obtained concerning the ascorbic acid deficiency in the 24-hour rations.

N. A. Ryabko, Lieutenant Colonel of the Medical Service -- Hygienic Characteristics of Certain Sublimated Products.

For purposes of hygienic characterization of sublimated

products (meat and fish) they were subjected to a physico-chemical examination, and dishes prepared from them were evaluated from a hygienic standpoint.

The physico-chemical and organoleptic characteristics of the sublimated fish and meat were entirely satisfactory after six months of keeping.

The first courses were prepared of dried meat and fish; tasting them showed that these products, both in the form of mince-meat and in the form of chunks made a good stew; their specific odor and taste were faint, there was no foreign odor or taste perceived; the general appearance, odor and taste of the courses were satisfactory.

An investigation of these food products for bacterial contamination showed that the colon bacillus titer was equal to 0.1. The increase in the bacterial seeding of sublimated fish and meat requires an improvement in the hygienic condition of the technological process of preparing them.

K. D. Stepanov -- Method of Preparation, Preservation and Shipping Sera for Virological Analysis.

The following method of preparation, preservation and shipping of sera for virological analysis in the division and regiment service areas is suggested.

Ten cubic centimeters of blood are taken by the usual method from the antecubital vein and introduced into the small bottle utilized through a rubber stopper and under a layer of penicillin. The rubber stopper is disinfected with alcohol. The rim around the stopper of the bottle is not removed. The penicillin residue which is in the bottle does not interfere with the test in performing the neutralization reaction. For performing the complement-fixation reaction penicillin can be removed readily. For this purpose sterile physiological solution is introduced through the stopper into the bottle underneath the penicillin by means of a syringe, and then, turning the bottle with its bottom up, the solution is aspirated with the syringe. If the blood in the bottle does not come out, a second needle is introduced along with the first for the purpose of letting the air out of the bottle at the time the blood is put into it. The blood is left for a day in a cooled place for the purpose of separation of the serum. The separated serum is aspirated, for which purpose a long needle is introduced through the rubber stopper which is connected with a sterile syringe. By the method described above this serum is introduced into another bottle. The serum is ready for storage and for shipping. By the same method and after first

removing the penicillin from the bottle by physiological solution, it is possible to prepare, store and ship sera for the classic Widal, Weil-Felix, Wright and Wassermann reactions.

V. A. Tyukin, Colonel of the Medical Service -- The Problem of the Types of Medical Care.

In the existing nomenclature there are five types of medical care -- first aid, aid before the patient is seen by the physician, first aid by the physician, specialized and qualified medical care -- it is impossible to say what criteria have been made the basis of each of these definitions. There is no single feature (order in which patient is to be seen, time, quality, etc.) which might be taken as a basis in defining all five types of medical care. This causes quite a few misunderstandings in the practice of medical care and particularly in the training process.

In order to eliminate these inconveniences and misunderstandings some principal characteristic should be made the basis of the definition of the types of medical care. It may be the order in which the patient is seen (first, second, third), degree of emergency (emergent, urgent), the place in which medical care is given (battlefield, battalion medical aid station, regimental medical aid station, division medical aid station) or the degree of qualification of the persons rendering medical care. Most expedient is the division of medical care into types on the basis of the last characteristic, that is, the degree of qualification of the person rendering the medical care. Medical aid which is now called "first aid" is given at the place where the affliction (or disease) occurred, and in the great majority of cases by people who do not have any medical education. Therefore, the concept "first aid" should be maintained.

Aid before being seen by the physician according to the current conception is aid rendered by secondary-school medical personnel. In the great majority of cases, this aid is rendered by a feldsher; therefore, it should be called "feldsher aid."

First aid by the physician is given by a physician who has no definite medical specialty. However, he must render medical aid in any affliction or disease. This is the aid of the physician in general practice. Therefore, it is expediently called "general care by the physician."

Qualified medical aid means aid which is given chiefly by a surgeon or internist (or, perhaps, by a stomatologist or toxicologist). This type of medical care can with full basis

be called "specialized." In connection with this, it is best to replace the previous concept "qualified" and "specialized" medical care by the single concept "specialized medical care."

In the terminology being suggested, the possibility is afforded, for example, for a physician to render "first aid" or "feldsher aid" if the circumstances do not permit him to render aid in the volume of which he is capable based on the level of his training. Very often we run across such a situation under modern conditions. The reverse situation, where, for example, a feldsher renders "general physician care" is not excluded either, but in this case medicolegal problems come into the picture.

E. I. Margolin, Captain of the Medical Service and N. M. Shekhtman, Major of the Medical Service -- Record Card for Medical Orders for Regimental Medical Aid Stations.

A record card is suggested for keeping account of the execution of orders by the patients and for controlling their treatment by the physician.

It has the size of a medical record book and consists of four pages. On the face side of the record card the troop unit, last name and larger military unit of the patient is designated. Under this, there are columns which designate the following: the prescription, the date on which they are taken, the number of visits by the patient to the medical aid station per day and the signature of the medical worker carrying out the treatment. On the second, third, and fourth pages are similar columns.

The names of drugs and procedures, the dosage of them, the number of times they are to be taken per day, and also the dressings prescribed are written into the first column "prescription." In the second column, the physician notes the specific dates on which he is ordering the taking of drugs, procedures and dressings. In the third column, "number of visits" every visit by the patient to the medical aid station for the purpose of obtaining treatment throughout the day is noted. Finally, in the last column, the signature of the medical worker is written to indicate that the patient has had his treatment for the day or a note that the patient did not come for treatment.

During admission of the patient, the record card is given to the medical worker who fills in the physician's orders; the medical worker, after carrying out the physician's order places the record card into a special card index. The latter is constituted by a small drawer in which there are 31 plywood spacers according to the number of days

in the month, for each of which there is an appropriate number. The record card of the physician's orders is placed specifically in the space for the date of the month on which the next procedure or next dose of medicine is prescribed. If the treatment has been concluded the record card is turned over and inserted into the medical record book of the patient. Without the record card the outpatient department does not give any further treatment. At the time of subsequent visits by the patient to the physician, the record card is brought to the admitting room along with the patient's medical record.

Lessons from History Cannot Be Forgotten

Assistant Professor V. I. Agafonov, Colonel of the Medical Service

As a result of destruction of German Fascism and Japanese imperialism during the Second World War, the correlation of powers on the world arena was sharply changed in favor of socialism. The might of Soviet Union has been strengthened; its international influence rose considerably.

Growth of power and of international authority of USSR, outstanding successes of the brotherly Chinese people and of countries of People's Democracies in economic development, stir up furious anger in the camp of imperialism and reaction. The militaristic circles of certain imperialistic states, powerless in their anger, intensify the haste of rearmament, the production of means for mass annihilation of people, preparing for new aggressions.

As it is known, bacteriological weapon is one of the means of imperialistic aggression. It was not by chance that criminal research in the field of use of the bacteriological weapon was the most actively and widely conducted during the period of the last war by Hitler's Germany in the West and the imperialistic Japan in the East. It is known to the whole world that the entry of USSR into the war against the imperialistic Japan has saved humanity from the possibility of the unleashing of the bacteriological war on a large scale. General Iamado, former Commander-in-Chief of the Japanese Kwantung Army, declared: "Soviet Union's entry into the war against Japan and the dash of Soviet Army into the depth of Manchuria deprived us of the possibility of using the bacteriological weapon against USSR and other countries..."[1].

The law suit in Khabarovsk, in 1949, revealed the crime of Japanese military circles, who prepared and used the bacteriological weapon.

The book of Kh. Akiyam "Special Detachment 731"[2] not only confirms, but also considerably supplements with factual material the general picture of crimes of the Japanese military clique. This book reinstates, in the memory of the

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[1] Data of the law suit in the case of former servicemen of the Japanese Army, who were accused in the preparation and use of the bacteriological weapon. Gospolitizdat, M., 1950, page 27.

[2] M., Publisher of foreign literature, 1958. Translation from the Japanese language.

Soviet people and of the entire progressive humanity, the perfidious schemes of ideologists of the Second World War against the nations of the world, and at the same time is a stern warning to new pretenders to world dominion, who contemplate new crimes against humanity. In this book a picture of cruel crimes against humanity by a special detachment is revealed. The author of the book is a former co-worker of this detachment, eye-witness and accomplice in crimes, that were perpetrated on the territory of China and in border regions of the Mongolian People's Republic and USSR.

In the first half of this book it is described how the author got into this detachment, the conditions of work there, as well as the structure and the tasks of the detachment. In the second part of the book an account is given about the organization of mass cultivation of bacteria and experiments of infecting people with them. In the third part the author relates how they tried to cover up the traces of their monstrous crimes, quickly liquidating and destroying all that could become an evidence of crimes, committed by the detachment 731 on defenseless people. Finally, in the concluding remarks of the Japanese edition a series of excerpts are given from official documents of the Kwantung Army and the political police, which characterizes the activity of the detachment from the moment of its formation, that is, since the year 1935. Special attention is given to prove the authenticity of the events presented in the book, as well as attempts are made to extenuate the guilt of the book's author.

"Working over the book," writes the Japanese editor, "the author set before himself a limited aim -- to describe only that which he himself saw, heard and felt. The book is not the author's fancy, the figures and facts are not exaggerated there in order to startle the reader. Exactly for this reason the book must horrify the reader still more."

The Soviet reader remembers it well and cannot forget the monstrous crimes of this detachment, and of those like it, that were formed, by the decree of the emperor, in the Japanese Army.

The special detachment 731 was a mightly production, scientific-research and training-methodical center in Kwantung Army on the research of methods for conducting biological war and for the preparation of bacteriological weapons on a mass scale. Over 3,000 scientific and technical workers were enployed there; it was equipped with the newest technical equipment and the most improved apparatuses.

The first department was occupied with the research

and the cultivation of bacteria, the most effective for their application as a means for bacterial attack. The second, tested the effectiveness of the obtained cultures of microbes on people and developed models of projectiles and aerial bombs for the application of bacteriological weapons. Here also fleas were grown, in enormous quantities, which were infected with plague bacteria. A special proving ground was set at the disposal of this detachment, as well as an aviation unit with airplanes, equipped with special apparatus. The third department carried out the control on water-supply of the army and produced the cases for special bacteriological shells, which were intended for dumping the fleas, that were infected with plague. The fourth was the production department and had at its disposal powerful technical equipment, which was designed for the mass cultivation of bacteria. During one production cycle it could cultivate 300 kg of plague bacteria, 700 kg of anthrax, one ton of cholera, and so on. Finally, the fifth department was busy training cadres, who would be able successfully to use the means of bacteriological aggression.

Experiments on people for testing the efficacy of the bacteriological weapon were characterized by special fanaticism and brutality. Exceptional cynicism of Japanese murderers from detachment 731 was expressed, in particular, in the fact that people, who were earmarked for criminal experiments, were conditionally called "logs." "The experiments had a purpose to ascertain the degree of contamination, depending on the radius of scattering the infected shell-splinters," writes the author. "For this purpose, every 10-20 meters, from the point where the bomb was supposed to fall and explode, posts were dug into the earth and the "logs" were tied to them... either in shorts alone, or fully clothed, leaving naked either alone the buttocks, or only the face and hands. Whereupon they tried to clothe the experimental persons in clothing that is usually worn by the most part of the population. The unfortunates fell ill, and after that they were subjected to experiments for treating horrible diseases, although there was no hope for saving them. Even if, occasionally, one of them recovered, he was not left alive anyway" (pages 53-54).

In another place the author describes experiments, outrageous in their brutality, with convicts, who were in the special prison of the detachment. These people were doomed for inevitable destruction, and there was no end to their flouting. "In the center of the room a man ("log") was tied to an iron cot, which was black, as if smeared with tar, and he struggled desperately in the hands of the assis-

tants," writes Kh. Akiyama. "Men, in special clothing, like the one I wore, held the victim indifferently, like automatons. 'The log' tried to defend himself, although his hands and feet were already tied.... A man, who was used for an experiment, like an experimental animal, must be healthy, since if he is sick and weakened, the results of the experiment will not reflect the picture of the course of the disease under ordinary circumstances" (pages 62-63). And further on "...judging from the fact that the timekeeper intently followed the course of disease after the injection, I understood, that they checked the speed of the effect of some bacteria. The unfortunate one writhed in terrible pangs, emitting heart-rending cries, but finally fell silent as if his strength became exhausted. The experiment continued for two to three hours... That night I was ordered to remove his corpse."

Thousands of corpses of men, tortured thus, were constantly cremated in special ovens that were constructed on the territory of the detachment.

Still greater anger is provoked in the reader by the experiments on infecting Chinese civilian population, especially children, by specially formed sabotaging groups of this detachment. For this purpose various methods and measures were utilized for intentional infection of people with the aid of food products, that were seeded with virulent bacteria, as well as fleas, that were inoculated with plague, as well as other factors of infection transmission. Whereupon, having artificially caused an epidemic among the local population, the co-workers of the detachment then went there as if for the organization and conducting of antiepidemic measures. But, as a matter of fact, the co-workers obtained there the necessary material for research (tissues of lungs, spleen, lymphatic nodes of the dead children), then burned down the populated points, and shot down the remaining living inhabitants.

Thus, the testing of bacteriological weapons were not limited to experiments on people in laboratories, prisons and on proving grounds of the detachment. Japanese man-haters have used this weapon also in the war against China and in sabotaging sallies also against USSR and the Mongolian People's Republics.

In 1939, it was applied in the region of the river Khalkhin-Gol, in 1940 -- in Central China ("Nimbo" city, to the south of Shanghai), in 1941 -- in the region of the lake "Duntin-su" ("Chande" city), in 1942 -- in "Chzhegan" rayon

(Central China)[1], and so on.

We cited only some of the data about the crimes committed by detachment 731. Nevertheless, one should not forget that these crimes, in spite of all their monstrosity, served the purpose of preparation for new, still more horrible crimes. According to the intentions of ideologists of the bacteriological war, their weapon was supposed to cause countless distresses to the whole peaceloving humanity and entail the destruction of millions of innocent people. Nevertheless, these perfidious intentions were not destined to be realized. The Soviet military forces, having destroyed the Kwantung Army, liquidated the danger of the loosening of bacteriological war.

Realizing the seriousness of their crimes against humanity, and being afraid of their responsibility before the population, the command of the Kwantung Army took immediate steps for destroying and concealing the traces of the criminal activity of the detachment. This part of the book begins with a chapter "The Fatal Day," where the author describes the state of confusion and full bewilderment during the day when Soviet Union declared war on Japan. In order not to have any living witnesses, all the prisoners, who were in the detachment, were killed with potassium cyanide, with which their food was poisoned. Those who did not eat the food were shot through the prison windows with machine guns. Extraordinary measures were taken for the cremation of corpses. After having brutally disposed of the living witnesses, the detachment set about to destroy their buildings, apparatus and equipment of their laboratories. Potassium cyanide was distributed to the personnel and the strictest order was given to keep the secrets of the detachment. Each was obliged to take his life at the critical moment.

The author of the book "Special Detachment 731" did not want to give his real name and used a pseudonym Khirosi Akiyama. Many years after the defeat of Japan he lived in constant fear that he will be taken to court as a military criminal, and kept the secret of the detachment very strictly. "This guilt restrained him as he recognized that he himself took part in the terrible experiments with people and in the cremation of corpses," wrote the Japanese editor, Iti Takemura. In connection with this, the Soviet reader cannot understand why our publisher calls the author

[1] Look up the law suit on the case of former military men of the Japanese Army, who were accused in the preparation and use of bacteriological weapons. Gospolitizdat, M., 1950.

only a "witness" (page 5), while he was a direct co-worker in crimes perpetrated by the Special Detachment 731.

The book is instructive not for the Japanese alone. It alerts all progressive people, all the nations of the world and requires to be especially vigilant of the intrigues of the enemies of peace at the present time.

On the part of certain imperialistic states and, first of all, of the aggressive circles in USA, attempts are again being made at the present time to plunge humanity into the abyss of war. Hindu newspaper "Blitts" reported in the correspondence from New York: "At the end of 1956 the National Security Council of USA made a decision about the expansion of the Chemical Corps of USA and the production of bacteriological weapon on a mass scale. Making such a decision, the political and military leaders of USA proceeded from the fact that USA has lost its superiority in the field of atomic weapons. In order to compensate the loss of this monopoly, the Defense Ministry received an order to start a wide program of work on the bacteriological weapon"[1]. In order to speed up the development of chemical and bacteriological means of attack, the military budget for the Chemical Corps was considerably increased, new testing grounds for the bacteriological weapons were established in Wendover, on Marshall Islands, Okinawa, and others. The center of activity of the Chemical Corps is as yet the proving ground Bugway in the state of Utah.

However, it is not so easy for the warmongers to realize their wild plans, because the powerful Socialistic camp is resisting them; as well as the movement of the nations for peace, for the prohibition of weapons of mass destruction of people. Soviet Government, constantly defending the work for peace, persistently strives for the prohibition of all means of mass destruction, including also the bacteriological weapon.

The support of the Soviet Government of the prohibition of weapons for mass destruction found an intense backing among the millions of laboring masses in the whole world. The powerful front of Democratic powers, which are headed by the Soviet Union, represents real strength, which can cool off the hot heads of militarists.

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[1] "Komsomol'skaya Pravda" of 24.3 1957 [The Young Communist League's Truth, 24 March 1957].

The Great Medical Encyclopedia -- A Valuable Manual for Military Physicians

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More than ten years have passed since the publication of "The Encyclopedic Dictionary of Military Medicine." This work has up to now been the main general reference book on problems of military medicine; however, as is known, it reflects chiefly the experience in the work of the military medical service during the period of World War II. Its importance should not be depreciated even today; however, there is much in it which cannot satisfy the military physician both in the theoretical and the practical aspects.

In connection with the adoption of new facilities for waging war as army equipment, particularly mass attack weapons, Soviet military medicine is confronted with new problems. This has required a revision of the views on a number of problems of medical care of the troops. Specifically, the change in the structure of medical losses under conditions of modern warfare has advanced the need for examining once again the problems of stage therapy of battle injuries. Therefore, a great need has arisen for new textbooks, in which the military physician might find a systematized presentation of modern views on the main problems in theory and practice of military public health. Unfortunately, there are still very few such works. Therefore, military physicians have awaited the publication of the new 35-volume publication of the Great Medical Encyclopedia (BME) with impatience and hope. Familiarization with the first five volumes of the BME being criticized by us now convinces us of the fact that military physicians in the main have not been deceived in their expectations. These volumes, which in their entirety have 6,188 pages including terms from the letter "a" to the word "vulcanization," has been printed on good paper, richly supplied with beautiful figures, tables, diagrams, gramophone records (this is something new in the practice of publishing Soviet reference works) with records of the various sounds which occur in the human body during pathological processes and with stereoscopic illustrations. The majority of the articles has been written by great specialists and answer the requirements of an encyclopedia; they are sufficiently succinct, are presented in language which is understandable to the medical records at large, and correspond to current scientific views. There is no doubt

that military physicians in any classification of work and specialty will find much in the material of the encyclopedia volumes published which is useful for them.

Military medical problems and the volumes being criticized are presented both in the form of independent articles and in the form of supplements to such articles which clarify the military medical specific characteristics of the problems being presented. Specifically, problems characterizing the injurious effect of atomic, chemical and bacteriological weapons and also protection against them have been discussed extensively. It is fitting to bring to mind that in the preceding publications of the BME problems of military medicine were poorly represented.

In the new publication of the Great Medical Encyclopedia military physicians will find principally correct, scientifically grounded answers to many military medical questions. However, certain articles are not devoid of shortcomings in this connection. Below, we shall dwell on those articles which should attract the attention of military physicians primarily.

Naturally, articles which deal with mass attack weapons are of special interest to the military physician. In the second volume, the group of authors of the article "Atomic Weapons" has quite fully presented the mechanism of the atomic explosion and of its injurious effect and have also made certain recommendations on the organization of medical care to the injured in the focus of the atomic explosion. However, the handling of certain problems in this article makes us wonder. Thus, for example, we cannot agree with the statement that "fatal injury of the people who are outside of shelters occurs in an area where the excess pressure of the shock wave is equal to or greater than 0.5 kilogram per square centimeter" (page 1080). Such excessive pressure does not always produce such a severe trauma. At the same time, the author of the article "The Explosion" (Volume 5, page 342), where the mechanism of production of the explosive (shock) wave has been analyzed in detail, it is justifiably mentioned that fatal injuries occur with an excessive pressure equal to 0.7 to 1.0 kilogram per square centimeter of human body surface, and with a pressure less than 0.7 kilogram per square centimeter only "contusions" occur (page 326); these figures are in agreement with the current data on this problem. In characterizing the injurious effect of the shock wave, the authors should have more clearly shown the effect of the thrust of air masses, which can throw a man great distances and create a shower of secondary missiles.

The authors correctly indicate the fact that the very

hot air of the shock wave is capable of producing thermal injuries of people. This very hot air, by penetrating into tissues, shelters and other defense structures, can produce burns of the open body surfaces and of the respiratory passages in man.

It is hard for the reader to agree with the statement that the "wink reflex, according to all data, successfully protect the eye against severe injuries by light radiation" (page 1084). Such a statement can lead medical personnel astray, because actually the wink reflex is delayed and in actual practice at the focus one has to deal with severe eye injuries. In the article it is mentioned that "ultra-violet rays produce only skin pigmentation... or, conversely, depigmentation of it up to the point of complete loss of pigment, without any visible signs of a burn" (page 1084). However, as is known, in the population of Nagasaki and Hiroshima which suffered from the atomic explosions, so-called late burns similar to sunburn were noted. They occurred as the result of the effect specifically of the ultra-violet rays. Nor should attention be omitted to the possibility of injury of the inner ear from the effect of the excessive pressure of the shock wave. If the authors had learned all the types of injury mentioned, the characteristic features of the health losses from the atomic blast would be much more complete.

In characterizing the structure of atomic injuries the authors limited themselves to a reference to the data of T. Sears as well as a list of factors which change the interrelationship between the various types of injuries. Taking into consideration the significance of this problem it would have been more practical to indicate specifically what changes in the structure of health losses are observed in an explosion which occurs under various conditions: for example, in a fog or when the troop units are under a smoke screen, or when troops are disposed in the woods, in shelters, tanks (in the event of an atomic blast, for example, in a wooded locality, or under fog conditions, the injurious effect of light radiation is limited considerably). These changes to a considerable extent predetermine the character of the medical classification of the injured and the list of therapeutic-prophylactic measures to be taken at the stages of medical evacuation.

The authors did not distinguish between the regimental medical aid station and the division medical aid station with respect to medical classification and the volume of medical aid to those injured by atomic weapons, and this complicates the understanding of such important problems. It would have been better to present the volume of medical aid and the

principles of medical classification in distinct fashion and differentially for the regimental medical aid station and the division medical aid station. Since this problem is one of principle, it would be desirable that the editorial staff of the BME study this problem and clarify it properly in subsequent volumes and corresponding articles (medical classification, state treatment, etc.).

In this article little attention was given to radioactive substances formed during the blasts of atomic and hydrogen bombs. At the same time, material published in the foreign press indicate that even air explosions conducted at great heights, and, particularly, ground, underwater and underground explosions, are accompanied by the formation of such a large quantity of radioactive products that they can contaminate tremendous areas measured in many thousands of square kilometers. Thereby, great contamination densities can be created at distances of several hundreds of kilometers from the epicenter of the blast. In the article it is mentioned that there are essential difficulties in the protection of the skin against radioactive substances. This point of view is inadequately precise. The skin is protected from contact with radioactive substances by the same facilities and with the same success as it is against the permanent war gases. However, these protection facilities do not shield man from the effect of gamma radiation, from which there is actually no individual protection.

Articles are included in the encyclopedia devoted to the alpha- and beta-radiation (Vol 1, page 871). For the purpose of acquainting the readers with the physical characteristics of these forms of radiation the indicated articles were sufficient. However, it would be desirable to find at least a brief medical characterization of radioactive emanations in the Great Medical Encyclopedia. Specifically, the injurious effect of alpha- and beta-radiation with the entrance of radioactive substances into the body, onto mucous membranes, skin and burn surfaces should have been presented.

Problems of military field surgery have been reflected in articles "Amputation," "Anaerobic Infection," "Local Anesthesia," "Antibiotics."

The article "Amputation" (Vol 1, page 1008) cannot but attract the attention of military physicians. In a quite complete manner it discusses the methods of this operation and therefore is of definite help to hospital physicians. However, this article by far does not exhaust the problem. Specifically, the military medical and community significance of the problem of invalidism has been circumvented. Therefore, the achievements of modern medicine should have been

shown in a much more extensive fashion (the use of antibiotics, immunization, suturing of injured blood vessels, etc.), which permit the limiting of indications for amputation and, by the same token, reduce invalidism.

The indications and contraindications to amputations are not adequately revealed in the article. Particularly, there is no presentation of current views on amputation in the presence of the contamination of wounds with radioactive substances or in the presence of injuries with high doses of penetrating radiation. Inadequate attention has been given in the article to the prophylaxis of complications which lead to amputation. The postoperative course is given very little discussion. Indeed, all these problems are of considerable interest both to the civilian and the military physician.

The article "Anaerobic Infection" is very interesting (Vol 1, page 1129). The current views of the etiology, pathogenesis, clinic, therapy (including also stage therapy) and also the prophylaxis of this formidable complication are analyzed in the article with considerable knowledge of the matter and quite completely. The author of the article (D. Arapov) is a very great specialist in matters of anaerobic infection; therefore, it is a shame that he did not analyze the problem of the development of anaerobic infection in persons injured by penetrating radiation. One comment should be made with reference to this good article: is not the author too categorical in his statement that primary sutures have an injurious influence in warfare? As is known, at the present time this problem is being re-examined from the point of view of expanding indications for the application of primary sutures after debridement of the wounds, particularly in persons involved by penetrating radiation. This represents an attempt to achieve complete healing of the wound before the climax of radiation sickness.

In the extensive article "Local Anesthesia" (Vol 2, page 130) which has been written by several authors, the military physician will find information concerning the physiological mechanisms of anesthesia, the technique of giving it, the indications for and contraindications to it and prevention of possible complications. Sufficient attention has been given in the article to each type of local anesthesia. However, the absence of a generalizing section in the article puts the young physician in a difficult position. It would be desirable to have a generalizing section containing a comparative evaluation of the indications for each type of local anesthesia. The inclusion of a description of the technique of vagosympathetic block and local anesthesia of gunshot fractures in the article would have

enhanced the practical value of the article.

It should be mentioned that the physiological grounding of the mechanisms of local anesthesia were presented in a language which is not very understandable by medical workers at large. It would hardly be easy to understand the following sentences: "According to current concepts, activation of the receptor structure amounts to the fact that the external stimulation (mechanical, chemical, light, etc.) excites the receptors which are adequate for it, which in turn transform the given type of energy into a neural process. In all cases of reception this process of tranformation is concluded by a sudden depolarization of the cutaneous branches of the sensory fiber, as the result of which nerve discharges occur" (Vol 2, page 133).

In the article, "Arteries" (Vol 2, page 677), the military physician finds clear and neat material on the sites where the arteries come to the surface, which is of great importance for cases of application of digital compression of arteries for purposes of stopping bleeding.

The military physician will obtain much that is useful for his practical activity in the good article "Autoinfection" (Vol 2, page 1163). However, the article would have undoubtedly been benefited if proper attention had been given in it to the role of autoinfection in radiation injuries. Indeed, it is known that in the process of development of radiation sickness autoinfection plays an important part in the outcome of the disease.

In the article "Agony" (Vol 1, page 169), the most important characteristic features of the agonal state are discussed. Knowledge of these characteristics is particularly important for military physicians in the event of a mass advent of injured persons to the stages of medical evacuation.

In the volumes which we are criticizing the military physician will find quite a lot of useful information on the matters of military toxicology and radiology. Interesting data are reported in articles devoted to antidotes and particularly to antidotes for war gases. The articles are written at the level of the current concepts in this field. The military physician will find a particularly large quantity of useful information in the article "Antidotes to War Gases" (Vol 2, page 281), in which not only the principles of antidote therapy for war gas injuries are presented but also a whole series of concrete examples of antidote treatment of intoxications are given.

One comment should be made with reference to the very disputable inclusion of adsorbents, for example, activated

charcoal, among the antidotes, in connection with this article, "Antidotes." In the articles "Sodium Subnitrite" (Vol 1, page 335) and "Amyl Nitrite" (Vol 1, page 942), the reader will find mention of the fact that these preparations are utilized as medicinal agents for cyanide intoxications. It would have been very good if the author of the article "Atropine" (Vol 2, page 1107) would have followed this example and indicated the fact that atropine is still the most widely recommended agent abroad for the treatment of "nerve gas" injuries.

The phenomena of adsorption are characterized fully in the encyclopedia (Vol 1, page 289), as has been also the most widely utilized adsorbent, activated charcoal (Vol 1, page 512), the medical use of which has also been discussed in quite some detail. We believe it necessary only to indicate the fact that activated charcoal is expediently taken internally with two percent sodium bicarbonate solution rather than with water, because thereby a neutral or slightly alkaline medium is created in the stomach, in which the adsorption of toxic agents, for example, was gases, by the charcoal occurs most successfully.

In the second volume of the encyclopedia there is quite a detailed article on anticholinesterase substances (page 348). By acquainting oneself with it, one may obtain a quite complete and current concept of the mechanism of action, pathogenesis and clinic of intoxication with these compounds, and also of the principles of therapy of this kind of intoxication. However, the authors of the article should have mentioned that the most aggressive of the modern war gases -- tabun, zarine and zoman -- belong in this group of anticholinesterase compounds. An evaluation of the possibility of using atropine for intoxications by anticholinesterase compounds should have been given in this article. As is known, according to the American data, the use of 50 milligrams of atropine a day is considered permissible after intoxication by these substances. Moreover, according to these data simultaneous intravenous administration of six to eight milligrams of atropine, use of which is recommended before the occurrence of signs of atropinism, is permitted. The description of the therapy of intoxications with these compounds in this article should not have been limited to just these preparations, which actually are not very prevalent or have very limited application.

I daresay, the article "Antifreeze" is of the greatest interest among the articles devoted to problems of toxicology (Vol 2, page 344). A detailed description is contained in it of the problems of the clinic, pathology, pathogenesis, first-aid, therapy and prognosis of intoxications with these substances.

Military medical workers, particularly those who are connected with problems of aviation medicine, will find useful information in such articles in the first volume as "Aviation Hygiene" (page 65), "Aviation Medicine" (page 69), "Adaptation to Altitude" (page 193) and "Acclimatization" (page 420), which have been written by great specialists in the field. In this group of articles reference should be made to the article "The Pressure Chamber" (Vol 3, page 434), which was written with great knowledge of the matter, in detail, and well illustrated with sketches and diagramatic figures. Although this article does not shed any light on the problem of utilization of the pressure chamber for military medical purposes, nevertheless, it is of great interest to military physicians.

In the volumes which are being criticized there are a number of articles in which military physicians will find material on problems of military epidemiology.

At the present time, problems of military epidemiology are attracting special attention of military physicians, since the aggressive circles of the participant countries of the North Atlandtic Bloc have been feverishly preparing for the use of bacterial weapons in warfare. In preparing for the use of bacteriological agents, the imperialistic circles of the United States of America are counteracting the prohibition of bacterial weapons ratified by the Geneva Convention in 1925. Certain military leaders of the United States Army are cynically emphasizing as an advantage of bacterial weapons the fact that in annihilating the people it does not injure the material resources.

A number of special research centers, plants for the production of bacterial weapons, and areas for testing them out have been created in the United States with the aim of preparing for bacterial warfare. Along with this, the United States is regulating and assisting the performance of similar operations in a number of countries of the North Atlantic aggressive bloc. In this connection, the article "Bacterial Weapons" (Vol 3, page 226), in which the authors shed light on the properties and characteristics of the bacterial weapon, the methods of using it, possible objects of bacteriological attack, as well as a system of measures on protection against this type of weapon, are of particular interest. It is unfortunate that the expediency of application of antibiotics directly after contamination with bacterial weapons was not shown in the article.

The authors of the article indicate absolutely correctly the difficulties of detecting bacterial agents in the environment by classic methods of investigation, for the

performance of which usually a considerable length of time is required. In connection with this, methods of accelerated detection of microbes (fluorescent microscope, phage diagnosis, etc.) are acquiring special importance; these make it possible to obtain results concerning the type of pathogen in several hours. The article would have been enriched by the presentation of the essence of these methods.

It should be emphasized that the utilization of botulinus toxin as a bacterial weapon is being widely discussed on pages of journals and newspapers in the capitalistic countries. In the article, little attention is given to botulinus toxin, the probability of application of which in bacterial warfare is extremely great, as is also the utilization of toxoids in warfare. This deficiency has not been filled in either in the thorough special article "Botulism" (Vol 4, page 266).

In connection with the possibility of application of the bacterial weapons in warfare by an enemy, the military physician was right to expect a description of the order of equipping and the routine of operation of cubicles under field conditions in the article "Bacteriological Cubicles" (Vol 4, page 32). However, this problem was not clarified. Incidentally, we are in doubt as to the correctness of the name of the article. Wouldn't it have been more expedient to call it "Infectious-Disease Cubicles?"

Much interesting material for the military physician is contained in the article "Vaccination" (Vol 4, page 876). "Vaccine Therapy" (Vol 4, page 878) occupies an important place in the system of measures for controlling infectious disease, including the particularly dangerous infections. However, in these articles the proper evaluation and analysis of the effectiveness of vaccination against the most widespread highly contagious diseases was not given. In addition, it would be desirable for the reader to find out about perspectives for the vaccination of people against all the main particularly dangerous infections, to be performed in a short period of time or even at the same time.

Unfortunately, no answers to these questions can be found in the article "Toxoids" (Vol 1, page 1078). Herein chiefly an analysis is made of the characteristics of diphtheria and tetanus toxoids, while other types of toxoids which are of interest in the matter of immunizing the population and the army in wartime are omitted (toxoids against anaerobic infection, botulism, etc.). The article "Vibrios" deserves attention (Vol 5, page 342); herein, data are included concerning the degree of resistance of vibrios to disinfectants, which can be utilized in selecting the most

effective disinfectants in the practical work of the military physician.

The article "Medical Observation" (Vol 5, page 1141) will be of great help to the military physician in his work; here, the forms and methods of medical observation of those who have recovered from various infectious diseases are presented in a thorough manner. However, the entire variety of forms of medical observation should not have been boiled down simply to measures for controlling infectious diseases for the practical work of the military physician. The military physician has to observe also persons involved by small doses of penetrating radiation or those who have suffered from war gases, those who are in poor condition, etc.

In the volumes being criticized, the military physician will find useful information on military hygiene. Specifically, this pertains to the significance of vitamins in metabolism, man's need for them, the prophylaxis of alimentary dystrophy, etc. These problems have been clarified in the articles "Vitamins" (Vol 5, page 600), "Ascorbic Acid" (Vol 2, page 901), "Alimentary Dystrophy" (Vol 1, page 683), "Vitamin Deficiency" (Vol 5, page 564). However, in the article "Vitamins" the author has shed insufficient light on the possibility of a need for preserving vitamins in the food during the process of preparing it. This problem was also circumvented in the article "Vitamin Deficiency" where certainly the section "The Prophylaxis of Vitamin Deficiency Among the Troops" should have, of necessity, given complete recommendations concerning the means of preserving vitamins in the food after the culinary processing of food products. It would seem that the author of this section should have recommended, for the prophylaxis of vitamin C deficiency among the troops, not so much vitaminization of the food with synthetic ascorbic acid, to which he devoted much attention, as a proper technological processing of fresh vegetables, potatoes, etc., which would assure the preservation of the maximum quantity of natural vitamins in them. The need for this recommendation also stems from the fact that in the article "Ascorbic Acid" (Vol 3, page 901) the author mentions that in the culinary processing of the food products the ascorbic acid losses reach 50 percent, on the average, and when prepared dishes stand around the vitamin C losses rapidly increase. At the same time, it is known that cooking of food in kettles with tight-fitting covers and boiling for a short time reduce the vitamin C loss in the food.

Articles devoted to sanitary technique are of substantial interest to military physicians. The article

"Military Medical Transportation" (Vol 5, page 916) attracts attention primarily. It is of a review nature. In it, the author devotes considerable attention to the history of the development of military medical transportation and also quite justifiably emphasizes its significance in the system of stage therapy with evacuation as indicated. However, the article would have been benefited considerably if other problems has been developed at the expense of a certain abbreviation of the historical section. For example, emphasis should have been laid on the view of evaluation as an obligatory measure preventing the creation of resting conditions so necessary for the injured, from which the importance of creating the gentlest types of transportation would be derived. It would have been extremely important also to mention the fact that in modern battle the medical transportation facilities are also designed for gathering up the wounded directly on the field of battle and in foci where there are mass casualties.

The indications and contraindications to the evacuation of the injured by airplane are presented clearly in the article "Aviation Medical Transportation" (Vol 1, page 76). In it, the complete characteristics of medical airplanes are given. The current importance of this problem is obvious in connection with the increasing significance of evacuation of the injured by air. The organization of air evacuation and the system of stage treatment requires the creation of receiving wards near airports and the extensive utilization for these purposes of the return trips of transport planes, which should have been mentioned in the article. The return trips of transport planes were quite extensively utilized in a number of operations even in the past war. Thus, in March 1943, through the utilization of air transport, it was possible to evacuate 16,500 wounded from Kursk to Yelets (Military Medical Journal, 1946).

The article "Automobile Medical Transportation" is of great interest for the military physician (Vol 1, page 121). In it, a description is given of ambulances, the order of adaptation of transport automobiles and transporters for evacuating the wounded. In the article, however, there is no description of the order of loading the injured onto the ambulance. The author's recommendation that "GAZ-63" and "GAZ-51" trucks be adapted for the evacuation of seven litters is doubtful. Experience shows that persons who are put in the third layer when such loading is used undergo a very considerable jolting. As a result of this, such a system of arranging the wounded should not be used. These trucks would be more expediently adapted for the evacuation

of four litter patients and eight sitting patients or five litter patients. Mention should be made of the fact that at the present time there is another type of ambulance -- "UAZ-450A" -- which is now utilized by public health agencies. Up to five litter patients can be arranged simultaneously in this roomy ambulance, which, however, takes up little space. Good shock absorption and a heating system for the body of the ambulance make it possible to create maximum conveniences for those being evacuated.

Interesting data from the point of view of tactical-technical characteristics can be obtained by the military physician from the articles "Mobile Operating Room" (Vol 1, page 137) and "Mobile Dressing Room" (Vol 1, page 141). However, the problem of the possibility of utilization of the mobile operating room and the mobile [automobile] dressing room under conditions of simultaneous mass casualties is disputable.

In the article, "The Mobile Dressing Room," emphasis should have been laid on the conveniences of the ambulance dressing room for rendering medical first aid on the march.

The thorough article "The Train Car" (Vol 4, page 833) for some reason omits mention of the hospital train. We are left to believe that in the article on railway transportation this problem will be clarified.

In the article "Military Pharmacies" (Vol 2, page 354) the functions of the division medical aid station pharmacy should have been differentiated from those of the medical battalion medical equipment storehouse. Combining these functions, as was done in the article, introduces confusion into the given problem.

These several shortcomings which have been noted do not necessarily diminish the importance of the BME for military physicians. While acknowledging the tremendous and very useful work which has been done by the editorial staff and by the authors of the articles, we should like to express the desire that in the publication of subsequent volumes the editorial staff of the encyclopedia will pay more attention to the requirements of the military physicians. Specifically, it would be practical to bring in appropriate military specialists on a broader scale to assist the authors in a number of articles of the greatest current importance, which would shed light on the problems also in a military medical aspect.

Scientific Session of the Military Medical Order of Lenin Academy imeni S. M. Kirov

A. I. Govorov, Colonel of the Medical Service, Candidate of Medical Sciences

This year the Military Medical Order of Lenin Academy imeni S. M. Kirov observed the 160th anniversary of its activity. On 3-6 January a scientific meeting was devoted to this date in the Academy, in which actual problems of military medicine were discussed. Along with reports which reflected the role of the Academy in the development of the Russian medical science such important problems were discussed at it as the organization of the medical service under conditions of modern warfare, treatment of wounds, burns, cardiovascular diseases, the prevention and treatment of shock, the prophylaxis of infectious and parasitic diseases, the prevention and treatment of radiation injuries, and blood transfusion.

The chief of the Academy, Lieutenant General of the Medical Service Professor P. P. Goncharov, in opening the meeting, discussed the principal stages in the history of the Academy and showed what a tremendous part it has played in the development of medical science and in the medical education of Russia. The Academy scientists have created numerous scientific schools which for long years have defined the development of medical and biological disciplines in Russia. Such eminent scientists as N. I. Pirogov, S. P. Fedorov, V. A. Oppel', S. P. Botkin, I. M. Sechenov, I. P. Pavlov, L. A. Orbeli, N. N. Zinin, A. P. Borodin, S. V. Lebedev, G. V. Khlopin, V. M. Bekhterev and many others who have glorified Russian science with their activity have worked within the walls of the Academy.

The Academy has trained more than 20,000 physicians and about 750 professors; its scientists have made more than 25,000 scientific investigations on many important problems of theoretical and practical medicine. At the chairs and in the laboratories at the present time the following persons are working: one academician, 16 active members and corresponding members of the Academy of Medical Sciences, 9 honored men of science, and 94 professors.

Professor P. P. Goncharov gave a special place in his report to the activity of the Academy in the development of military medicine during the Soviet period and, particularly, its part in the preparation and advanced training of military physicians for the Army and the Navy.

The report of Professor A. S. Georgiyevskiy, Major

General of the Medical Service, was devoted to the organizational basis of classification of those afflicted in battle and the sick under modern conditions. As is well known, the classification of the sick and the battle-afflicted at the stages of medical evacuation is one of the most important therapeutic-evacuation measures. The timeliness of rendering medical aid depends on it.

The speakers showed that the order of medical classification which existed in the past and which provided for the distribution of all those who arrived at the stage of medical evacuation according to its functional subdivisions does not answer the current requirements. With the simultaneous mass influx of battle-afflicted persons the need arises for the most rapid possible sending of those sick and afflicted persons whose need for medical aid can be somewhat delayed to the subsequent stages of medical evacuation. With the admission of the sick and the battle-afflicted to the medical aid stations and to the medical installations, Professor A. S. Georgiyevskiy recommends that their classification be accomplished in two stages. First, persons who constitute a threat to those around them are separated out of the entire group, as are also those battle-afflicted and sick who can be evacuated immediately to subsequent stages of medical evacuation for the purpose of obtaining exhaustive medical aid. Subsequently, all the others who have arrived at the classification post are sent to the receiving-classification department. The task of this department is the distribution of the arrivals into the following groups: 1) those who need medical aid at the given stage of medical evacuation; 2) those who are to be evacuated further; 3) those who are to be given outpatient treatment in the convalescent command of the given stage; 4) those who can not be transported; 5) those who must be isolated. Evacuation-transportation classification is accomplished in those functional units of the stage of medical evacuation where the medical aid is given to the sick and battle-afflicted.

Academy surgeons have, throughout its history, given considerable attention to the development of one of the principal problems of military field surgery -- the problem of treating gunshot wounds. A report on the modern principles of treating gunshot wounds was given to the session by the chief of the chair of military field of surgery, Professor A. N. Berkutov. The speakers showed that with the use of mass attack weapons by an enemy very often it will be impossible to treat a wound early. Hence, the need is shown for working out the indications for dividing the wounded into groups for the purpose of surgical treatment at various

time intervals after the wound occurred. The early prophylactic use of antibiotics at the present time makes it possible to perform debridement later and also increases the possibility of placing primary or delayed-primary suture in the wound and accomplishing more radical operative procedures.

Professor A. N. Berkutov in his report indicated a change in the attitude of surgeons at the present time toward the use of primary suture of wounds. While during the Second World War the placing of sutures in a wound was categorically forbidden, now the indications for primary suture of the wound have been formulated. The change in the viewpoint on primary wound suture has been produced primarily by the possibility of occurrence of combined radiation injuries, wherein wounds left open for a long time aggravate the course of the radiation injury. However, as A. N. Berkutov believes, recognition of the need of application of primary suture does not mean that all wounds need to be sutured. The scope of application of primary suture is limited by strictly defined conditions, among which the principal requirement is radical debridement of the wound. In those cases where the wound can not be radically debrided or where it is contaminated with a war gas or radioactive agent is is left open.

In the report of Professor P. A. Kupriyanov, Active Member of the Academy of Medical Sciences USSR, Lieutenant General of the Medical Service, and Professors B. S. Uvarov and Yu. N. Shanin, the current state and problems of anesthesiology were presented, which now occupy an independent place in medical science. At the present time, a considerable number of methods and drugs have been accumulated which permit the surgeons to use various of them, depending on the condition of the patient and the nature of the surgical procedures. Modern anesthesiology has at its disposal a large number of combined methods with the use of several anesthetics, local anesthetics, intubation, artificial respiration, the injection of muscle relaxants, neurolytic, ganglion-blocking and other agents the use of which makes it possible in varying degrees to maintain the principal physiological processes of the body at the necessary level.

The complexity of the modern methods of anesthesia requires highly qualified physicians -- anesthesiologists, to the preparation of which the Academy is giving considerable attention. Professor P. A. Kupriyanov emphasized that the future development of anesthesiology will to a considerable degree be determined by the search for new pharmacologic agents which possess a selective, controllable effect, and the clinical adoption of methods for the rapid determination for the most important indices of the depth of

anesthesia, concentration of anesthetics in the blood, gas content of the blood, the condition of the electrolytes in it, etc.

The problem of treating burns is of great importance for the medical service under modern conditions of battle operations. The report of Professor I. S. Kolesnikov, Major General of the Medical Service, and Professor T. Ya. Ar'yev, Colonel of the Medical Service, was devoted to this problem. In their report it was noted that burns in war and peace time are not comparable either with respect to the number of those burned or with respect to the severity of the course. In modern warfare with the utilization of atomic weapons and incendiary mixtures, burns will cause serious disabilities and will apparently produce a high mortality rate.

The authors presented the principles of treating burns, the essence of which amounts to the following: burns of the epithelium of the skin (first and second degree), as a rule, do not require any general treatment. In the case of extensive burns the use of antibiotics is indicated. Therapy of burn shock is accomplished by the same measures as for shock of other etiologies. The most effective method of treating dermal burns (third and fourth degree) is the operative method with the use of the dermatome.

The report of Academy consultant Professor V. N. Shamov, Lieutenant General of the Medical Service and Active Member of the Academy of Medical Sciences USSR, on blood transfusion evoked the considerable interest of the participants of the meeting. This problem began to be worked out for the first time in the Soviet Union at the Military Academy. In the Soviet Union blood transfusion has to a considerable degree been developed extensively and has obtained full recognition as a valuable therapeutic measure through the work of Academy scientists (V. N. Shamov, N. N. Yelanskiy, I. S. Kolesnikov, I. R. Petrov, N. K. Soroko and others).

Under conditions of battle operations the method of blood transfusion was used for the first time in the war against the Finns. In the subsequent period of the Second World War, 10 percent of all the wounded were given blood transfusions, and in certain armies, 13 percent, and even 26 percent, which played a considerable part in the treatment of the wounded with acute and chronic bleeding, in controlling shock, infections, avitaminoses and nutritional deficiencies.

In the report of Professor A. N. Maksimenkov, Major General of the Medical Service and Corresponding Member of the Academy of Medical Sciences USSR, new data were presented

on the mechanism of gunshot wounds. The method of spark photography used in the chair of operative surgery of the Academy has made it possible to gain an idea of the changes which occur in the internal organs and bones depending on the velocity of a bullet. As a result of the investigations the degree of loss of kinetic energy by the wounding shell was determined in the case of through-and-through wounds of various organs or areas, and the minimum kinetic energy of a wounding shell needed to penetrate into the deeper tissues was also established. The material presented in the report has practical significance, aside from theoretical interest, for military field surgeons in refining the method of debridement of the gunshot wound.

The pathogenesis, treatment and prophylaxis of various types of shock were presented at the meeting in the report of Professor I. R. Petrov, corresponding member of the Academy of Medical Sciences USSR. In I. R. Petrov's report it was shown that for the effective prophylaxis and therapy of shock it is necessary to take into consideration the changes in the principal nerve processes and disturbances in the functions of certain endocrine glands (hypophysis, suprarenals, thyroid gland). In analyzing the various types of treatment of shock, Professor I. R. Petrov pointed out that artificial hypothermia is ineffective in the treatment of experimental traumatic and burn shock. The use of neuroplegic mixtures in the comprehensive therapy of traumatic shock provides a good therapeutic effect experimentally.

For the purpose of normalizing the circulation Professor I. R. Petrov recommends the use of high molecular-weight solutions of the dextran type in addition to blood transfusion. In the comprehensive therapy of shock states it is also expedient to use ACTH, dibazole with glucose and polyvitamins.

Professor N. S. Molchanov, Lieutenant General of the Medical Service and corresponding member of the Academy of Medical Sciences USSR clarified the part of military field therapy in the organization of medical care of the battle activity of the troops in his report. Military field therapy, which has been created to a considerable degree by the works of scientists of the Academy, was created during the Soviet period. It played a tremendous part in the organization of the medical care of the battle activity of the troops in the Second World War. The percentage of patients returned to duty in this War reached high figures. Apart from the organization of therapeutic aid at the stages of medical evacuation, prophylaxis and treatment of the diseases under conditions of modern warfare, the problem of prophylaxis and

treatment of large groups of battle-afflicted from the new types of weapons (atomic, bacteriological, chemical) as well as the rendering of aid to a considerable number of those afflicted by combined injuries is the responsibility of military field therapy. Professor N. S. Molchanov pointed to the need for revising the organizational forms for rendering therapeutic aid at the stages of medical evacuation, broadening the prophylactic and therapeutic measures, the need for considerably greater contact in the work of internists, surgeons, neuropathologists, psychiatrists and epidemiologists. The current state of development of military field therapy requires a revision of the training of military physicians.

At the session, reports were given devoted to the problem of radiation injury.

As was shown in the report of Docent T. K. Dzharakyan, Colonel of the Medical Service, despite the considerable investigations devoted to the study of the biological effect of penetrating radiation, there is no unanimous opinion at the present time concerning the pathogenesis of radiation sickness. Here, the possibility of creating biologically active products in the injured tissues which, on entering the blood, can exert a toxic effect on the organism is of definite importance. Disturbances which occur in the tissues as the result of the direct influence of penetrating radiation define the onset of the disease. Afterwards, these disturbances are determined by the systems which produce the body's reaction to the effect of the pathogenic stimulations. The nervous system as well as the endocrine glands participate in the development of radiation sickness. The degree of injury of the nervous system and the part in which it plays in various stages of the disease are different.

Professor I. T. Kurtsin reported on the considerable experimental material obtained in the chair of normal physiology of the Academy in the study of the vascular disturbances in radiation injuries. In his report it was shown that the disturbances in blood vessel reception and in the efferent impulses from the cardiovascular system to the cerebral centers and the disturbance in the functions of the higher central nervous system centers are of the greatest importance in the mechanism of vascular pathology in radiation injury. The disturbance of blood-vessel reception from the internal organs occurs as early as the time that the ionizing radiation is operative and subsequently, with the development of radiation injury, it progresses, reaching its greatest degree of expression at the climax of the disease.

Experimental study of the course of radiation sickness indicates considerable changes in the immunological condition of the body. The natural resistance of the body to infection is reduced. As a result of the depression of the protective reactions of the body the infection aggravates the course of radiation sickness and leads to the death of experimental animals. The report of Professor A. V. Ponomarev at the meeting was devoted to the influence of ionizing radiation on the immunological reactivity of the body. He showed that under the influence of radiation a marked decrease in the immunological reactivity of the body occurs. Revaccination is ineffective in radiation sickness. Immunological reactivity is restored only after recovery of the animal which has been subjected to the effect of penetrating radiation. Immunity which has been elaborated against certain infections before the irradiation does not undergo any essential changes after the effect of penetrating radiation.

Modern principles of therapy of radiation injury have been presented in the report of Professor V. B. Farber, Colonel of the Medical Service. It is known that the syndromes of acute radiation sickness, which are associated with a disturbance in the immunogenesis, hematopoiesis and coagulation of the blood, are the most difficult to treat. For the purpose of preventing the development of these syndromes it is necessary to utilize vitamins, neurotropic agents (adrenalin, acetylcholine, strychnine), neuroplegic or nerve-blocking agents (thorazine), analeptics, compounds of the mercamine [cysteine] type and certain other preparations. The prophylactic effect of these preparations is increased by many times when they are combined. Hematopoiesis-stimulating therapy should be carried out with consideration of the reactivity of the body, the functional condition of the blood system, the degree of severity and the period of development of radiation sickness. With increasing circulatory insufficiency it is not recommended that hematopoiesis be stimulated. With severe anemia hemotherapy gives a favorable effect.

Professor V. B. Farber recommends giving earliest possible treatment with antibiotics and continuing it until the appearance of permanent signs of recovery.

Interesting data on the pathology of acute leukemias were presented in the report of Professor A. N. Chistovich, Colonel of the Medical Service. He and his co-workers showed that one of the expressions of the hemorrhagic diathesis is the production of hemorrhages in the bone marrow, which on macroscopic examination are not always clearly distinguishable from areas of hyperplasia of the myeloid tissue. The hyper-

plastic processes in the acute leukemias are accompanied by the degeneration of blood elements and the production of foci of necrosis of the bone marrow and bone tissue.

Acute leukemias are very much different in the nature of their development from tumor processes and from infectious diseases, although they have a certain similarity to the latter. In the opinion of Professor A. N. Chistovich, the virus theory of origin of the acute leukemias has a strong foundation.

Academician Ye. P. Pavlovskiy, Lieutenant General of the Medical Service, presented the problems of the theory and practice of the study of the natural focalization of infectious and parasitic diseases in his report; this has played a tremendous part in the study of the nature of a number of diseases and the development of measures for their prophylaxis. The establishment of natural foci of the disease occurs during the course of formation of geographic landscapes of the earth and of the evolutionary occurrence of viocoenoses without any relationship to the existence of people there. In nature, foci of disease may be created even now as the result of the business activity of man (for example, fresh foci of brucellosis).

Academician Ye. N. Pavlovskiy outlined the immediate problems in the study of the geographic distribution of natural foci of diseases and in the further development of a system of nonspecific prophylaxis of these diseases.

A historical review of the perfection of the system of prophylactic and anti-epidemic measures among the troops was given by Professor I. I. Rogozin, Colonel of the Medical Service and corresponding member of the Academy of Medical Sciences USSR. The speaker showed the great work that has been carried out and that is being carried out by the Academy among the troops for the organization of prophylactic and anti-epidemic measures and for the training of epidemiological specialists, microbiologists, hygienists and parasitoiogists.

The main principles of specific prophylaxis among the troops were presented in the report of Professors I. I. Rogozin and A. A. Sinitskiy. Professors I. I. Rogozin and A. V. Ponomarev have taken a great part in the development and incorporation into practice of mixed vaccines. At the present time, it has been shown that immunization with mixed vaccines using live, chemical, and corpuscular vaccines and antigens is not only possible but also advantageous in a number of cases. The speakers pointed out the importance of developing methods of special prophylaxis by means of antibiotics, bacteriophages, and immune sera.

The report of Professor N. N. Savitskiy, Major General of the Medical Service and active member of the Academy of Medical Sciences USSR, was also given at the session; in it he reported on the results of many years of work in the hospital under his direction on the study of the part of vascular factors in the disturbance of the function of the circulatory apparatus.

Numerous representatives of scientific institutions of Leningrad and other cities as well as representatives of the "Krasnogvardeyets" plant and of the Plant imeni Karl Marx were present at the meeting. The meeting constituted a kind of review of the scientific achievements of the Military Order of Lenin Academy imeni S. M. Kirov.

Inter-Garrison Medical Conference at Poltava

V. V. Nazarov, Colonel of the Medical Service
Colonel A. A. Melikyan

The first inter-garrison (district section) medical conference organized in October 1957 at the base of the Poltava Military Hospital proceeded very actively. The physicians of neighboring hospitals and infirmaries as well as the physicians of the garrison unit based at these medical installations were able not only to hear a number of theoretical reports but also to discuss their own work revealing deficiencies in it and exchanging helpful experience.

During the current year the second inter-garrison conference was held 9-10 April. The physicians of two field hospitals, three infirmaries and of the military units of the garrison were present at this conference. At the second conference, in contrast to the first, not only hospital physicians but also infirmary physicians and physicians of the military units gave reports. At the conference, 15 reports were discussed; of these four were given by the unit physicians and two by the chief internist of the military district.

Several reports were devoted to therapeutic-organizational problems: to an analysis of a comparison of diagnoses with which patients were sent into the hospital with clinical diagnoses (V. V. Nazarov), to an analysis of the cases of late hospitalization of patients with acute appendicitis (V. S. Stovbun), an analysis of tuberculosis in the units, which was discussed by the field hospital (A. P. Nuzhnyy), and an analysis of repeated hospitalization (N. F. Lebedev).

The reports and discussions showed that discrepancies in diagnoses were most frequent in those diseases such as pneumonia, kidney disease, and Botkin's disease [infectious hepatitis]; not uncommonly, a discrepancy in the diagnosis is the result of improper formulation of medical records. The number of cases of late hospitalization for acute appendicitis during the past three years has decreased by almost four times; at present, only those patients are hospitalized late who do not seek medical aid promptly because they do not ascribe any importance to their disease. This speaks for the fact that it is necessary to improve the organization of sanitary education. In a report on tuberculosis the tremendous part of prophylactic fluorography was shown.

On problems of neurology three reports were given: on the neurological clinic of hypertensive disease (M. B. Khait),

experience of treatment in the troop units of patients with neuroses (I. A. Vertgeym), experience in the treatment of sciatica with a compound mixture (M. S. Shindler, physician).

Troop physician I. A. Vertgeym reported on his own three years of observation of 49 patients with neurosis. In studying the individual characteristics of the patients, taking measures for the elimination of conflictual situations and conducting regular sessions in physical culture and light forms of athletics, the speaker restored the health and good service of 43 out of 49 soldiers. Experience has shown that treatment of patients with neuroses in the units is not only effective but also has a number of advantages over prolonged stay of these patients in hospitals.

In the report of treatment of sciatica, a not infrequent disease under army conditions, encouraging results were presented from the use of a compound mixture proposed by M. S. Shindler. He introduced an additional ingredient into the Beyke mixture -- pyramidone in the form of three-percent solution.

A. I. Kochergin, who gave a report on peizography in the diagnosis of endarteritis obliterans, demonstrated the piezograph which he proposed, and showed peizograms of the lower extremities in healthy and sick persons.

Lieutenant Colonel of the Medical Service Nikitichev reported on the organization of dietary treatment in the units for patients with chronic gastritides. He carried out a number of organizational measures -- training of cooks, substitution of food products, separating special places in the dining room, which provided considerable progress in such a difficult matter as furnishing privates and sergeants with dietary treatment. Persons who were given diets were under medical observation; many of them gained in weight and began to feel better; the number of admissions to the polyclinic and hospital was reduced.

Several reports were devoted to the problems of medical care under conditions of the use of atomic weapons. The chief internist of the military district, Colonel of the Medical Service G. I. Burchinskiy gave an interesting report on the topic, "Current State of the Proble m of the Pathogenesis of Radiation Sickness." Hospital surgeon N. T. Skrynskiy gave a review of the treatment of burn sickness; I. M. Stasik reported on his observations of recent years, particularly dwelling on the methods and results of skin grafting.

In the discussions the hospital and troop physicians made many valuable suggestions directed at the further improvement of therapeutic-prophylactic work.

The conference showed that troop physicians, with the aid of experienced field hospital physicians, can successfully work out the important scientific-practical problems of military medicine.

From the Editors

In connection with the article by Yu. V. Bukin, "Unpublished Letter by N. I. Pirogov on the French Publication of His Work 'Report on a Trip Through the Caucasus'" published in the Military Medical Journal No 12 for 1958, the editorial staff has received comments from readers (N. A. Oborin, A. M. Geselevich), which amount to the following:

1. N. I. Pirogov's letter was first published in excerpts by V. M. Korneyev in "New Surgical Archives" No 6, 1956, in the article "New Material on the Activity of N. I. Progov."

2. N. I. Pirogov's letter, as has been noted in the article by V. M. Korneyev, was in the stocks of the Affiliate of the Central State Military Historical Archives in Leningrad.

After obtaining Yu. V. Bukin's explanation in connection with these comments, the editorial staff reports:

1. The name of the article "Unpublished Letter by N. I. Pirogov..." intends the complete publication of the text of the letter (rather than in excerpts).

2. N. I. Pirogov's letter was kept in the stocks of the Central State Archives of the Navy up to the time of writing of Yu. V. Bukin's article, to which the stocks of the FTsGVIA were transferred.

3. Yu. V. Bukin undoubtedly, in publishing his letter, should have referred to the fact that it was first published in excerpts by V. M. Korneyev, a fact which Yu. V. Bukin must have known.

END