SCIENCE

VOL. 93 FRIDAY, MARCH 14, 1941 NO. 2411

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

Lancaster, Pa. Garrison, N. Y.

New York City: Grand Central Terminal

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

THE DIVISION OF MEDICAL SCIENCES OF THE NATIONAL RESEARCH COUNCIL AND NATIONAL DEFENSE

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SINCE last May there has been very active cooperation between the armed services of this country and the Division of Medical Sciences of the National Research Council on problems of military medicine. Because of the general concern with national defense it was felt that some report of these activities might be of interest to the readers of SCIENCE. For, in addition to the concrete results already achieved, the fact and degree of collaboration between civilian scientists and the Army and Navy Medical Corps and the Public Health Service are of great significance for the future.

In line with the original function of the National Research Council as an agency for scientific assistance to the government, the chairman of the Division of Medical Sciences in April of last year offered the services of the division to the Army and Navy. Shortly after this the Surgeon General of the Army, James C. Magee, requested the division to establish committees which would act in an advisory capacity to the medical corps. The Surgeons General of the Navy and of the Public Health Service concurred in the suggestion of civilian advisory committees, and immediate steps were taken to organize these groups. While at first the questions were confined to two specific problems—the treatment of traumatic shock and the chemotherapy of war injuries and infectious diseases—it was soon realized both by the members of these original committees and by the service representatives that in

order to meet the constantly arising problems in other fields of medicine it would be necessary to have a more general and a more inclusive organization. Up to the present time seven main committees and thirty-three subcommittees have been appointed. The main committees, covering the general fields, function largely through the technical subcommittees which in turn represent the special aspects of medical practice and research. Since there is a natural overlap between the general fields, some of the subcommittees are related to two of the main committees. (*See below.*)

The committees and subcommittees appointed up to this time are as follows:

COMMITTEE ON CHEMOTHERAPEUTIC AND OTHER AGENTS
Subcommittees:
- Infectious Diseases
- Venereal Diseases
- Tropical Diseases
- Surgical Infections

COMMITTEE ON TRANSFUSIONS
Subcommittees:
- Blood Substitutes
- Blood Procurement
- Shock

COMMITTEE ON MEDICINE
Subcommittees:
- Tuberculosis
- Cardiovascular Diseases
- Metabolism
- Medical Nutrition
- Clinical Investigation
- Diagnosis and Therapeutics
- Infectious Diseases
- Venereal Diseases
- Tropical Diseases

(Also related to the Committee on Medicine as well as to the Committee on Chemotherapeutic and Other Agents.)

COMMITTEE ON SURGERY
Subcommittees:
- Anesthesia
- Radiology
- Shock, Surgical Infections (See above)
- Wound Healing
- Surgical Specialities
  - Neurosurgery
  - Plastic and maxillofacial Surgery
  - Otolaryngology
  - Vascular Injuries
  - Thoracic Surgery
  - Orthopedic Surgery
  - Physical Therapy
  - Urology
  - Ophthalmology

COMMITTEE ON NEUROPSYCHIATRY
Subcommittees:
- Neurology
- Psychiatry
- War Neuroses
- Personnel and Training

COMMITTEE ON AVIATION MEDICINE
COMMITTEE ON INFORMATION
Subcommittees:
- Publicity
- Historical Records
- Correlation of Information

Policy and budgetary matters are dealt with by an executive committee consisting of the chairmen of the main committees and the chairman of the division.

A list of members of the committees and subcommittees and further details of their organization and individual activities have been given in *War Medicine* (1: 77–94, January, 1941). The Committee on Information serves as the editorial board of this new journal sponsored by the American Medical Association.

In the organization of the committees an effort has been made to assure broad representation of the various groups interested in these problems, not only through divisional membership of the special societies but also through the individuals on the committees. The government agencies are represented, in general, by liaison and contact officers assigned to the committees rather than by direct membership on the committees.

This relationship with the services and other governmental groups has been most effective. Since the work of the committees directly relates to medical problems of the national defense, naturally the Army and Navy Medical Corps and the Public Health Service have representatives at the meetings of committees, but contact officers from other branches of the armed services are present when the discussions concern them, as, for instance, the Quartermaster Corps of the U. S. Army and the Bureau of Supplies and Accounts of the U. S. Navy for problems of nutrition and rations. Among the other governmental agencies represented are the Veterans Administration, the American Red Cross, the National Bureau of Standards, the National Advisory Committee for Aeronautics and the National Roster of Scientific and Specialized Personnel. The division is represented on the Health and Medical Committee of the Federal Security Agency, by membership on it of the chairman of the division. Through this direct contact, the National Research Council committees serve as consultative bodies to this coordinating committee.

One of the most encouraging features of this endeavor is the way in which the services and the civilian groups have worked together. It is obvious that in a situation like the present there must be the utmost utilization of our scientific knowledge in meeting the needs of defense. The problems facing the Army, Navy and Public Health Service are many and great,

and these have been openly and clearly laid before the various committees. While the two medical corps have made great advances in medico-military science, it is realized by all that much remains to be done. New questions are constantly arising and the answers must be found quickly. The professional and research work going on in service organizations will have to be supplemented and the team work which has been developed is one of the most useful factors in doing this.

The general function of these advisory committees of the National Research Council is to give professional advice to the services and to plan and administer research projects essential to the national defense. To do this, the committees act in the capacity of a central agency. They have called on many scientists to assist them as consultants and have allocated research projects to various institutions, and will continue to in increasing degree.

Medical science and the medical profession have three special concerns in the present mobilization, the provision for trained medical men for the services, the evaluation of physical fitness of our youth for the Army and Navy, and the care of their health after induction. The selection and assignment of medical personnel is a very pressing matter, even now in a peacetime mobilization, and would become more serious in the event of war. The Army and Navy have large Medical Reserve Corps but there will undoubtedly be a demand over and beyond these. The National Research Council is cooperating with the Committee on Medical Preparedness of the American Medical Association, which is making an exhaustive survey and professional analysis of the entire medical profession through questionnaires sent to all doctors. Special groups from the Committees on Medicine, Surgery and Neuropsychiatry have been assigned to this task. The general activities of the National Roster of Scientific and Specialized Personnel in listing and evaluating all the scientists of the country have already been described in SCIENCE, and the Division of Medical Sciences is cooperating, along with the other divisions of the National Research Council, in this very important endeavor.

The examination of recruits, both by the local draft boards and by the induction boards, follows the standards laid down in Mobilization Regulations 1–9. A large part of this was revised by the committees of the National Research Council, which are continuing to study it and make changes in light of the information brought forth by the statistics from the examinations. The health of the troops in camp and of the men at sea is of constant concern to the medical corps. The best civilian consultation has been solicited and a number of the committees have made recommendations for the further safeguarding of these young men in their new environment.

Since we are now in a training program and not at war, a long period of active service is not provided to allow for intensive and special medical training of the reserve officers, but the Army and Navy are planning short courses; and many of the committees have been asked to aid in formulating these. In order to bring the latest information in various fields to the medical officers, circular letters and manuals are being prepared for general distribution. So far, circular letters on the chemotherapy of infectious diseases, on the treatment of venereal diseases and on tropical diseases have been assembled by the respective committees. It is also planned to issue a manual on general medical and surgical treatment in the field. The material for this has been collected by many of the technical subcommittees, and is now being edited. In addition, the surgical committees and others are at work on larger special manuals. Much of this material will appear in the new journal *War Medicine,* which is, in a sense, the official organ of these committees, with the Committee on Information acting as the editorial board. In addition, there will be published review articles on significant subjects, original contributions, abstracts of the current literature on military medicine and important news of defense activities relating to medicine. In this way, it is hoped that the information on these matters will reach not only those in the service, but also others who will be interested, in anticipation of future service.

Along with these pressing, immediate problems of an administrative type, the committees have been asked for advice and assistance on many questions of a more scientific character. There is not space here to tell of these in much detail, but some examples may show their nature. Thus, following a request from the Subcommittee on Tropical Diseases, the International Health Division of the Rockefeller Foundation has prepared a supply of yellow fever vaccine, which is now being used by the armed forces in the tropics, and arrangements have been made for further manufacture under government auspices.

Recently there was received a joint request from the Surgeons General of the Army and Navy to the American Red Cross and to the Division of Medical Sciences asking that these two bodies organize a cooperative program for providing blood plasma for transfusion. The Red Cross has agreed to make arrangements in the larger cities for voluntary donors of blood, to provide the necessary equipment for transportation to the processing centers and for storage. From this blood, liquid and dry plasma will be produced. The newly formed Subcommittee on Blood Procurement will assume general supervision of the professional services involved and professional personnel for the processing. Along with this the Subcommittee on Blood Substitutes is continuing its studies

on methods of manufacture so that the newest developments will be available for the program.

A further example of the cooperation between the Division of Medical Sciences and the American Red Cross is seen in the recent arrangements regarding requests from England. The British Ministry of Health has decided that all requests for medical and nursing personnel, hospitals and hospital equipment, medical and surgical equipment and supplies must come through the British Red Cross to the American Red Cross. Similarly, all American offers must be so routed. The Red Cross has asked the Division of Medical Sciences to assist in passing on personnel. Henceforth all requests from physicians, nurses and related personnel will be cleared and approved jointly by the two bodies.

Many of the questions brought before the committees demand immediate research before an answer can be given. Many important projects have been submitted or formulated, and on a few, active investigation has commenced under private auspices. Fortunately a few more can begin now owing to the allocation of a small appropriation of Federal funds. These include basic studies on the cause and treatment of shock, on the preparation and evaluation of blood substitutes for transfusion, on the chemotherapy of infections, on the cause and relief of fatigue, on the determination of night blindness and dark adaptation and on certain aspects of aviation physiology. Some of these last projects are being carried on in cooperation with the National Defense Research Committee.

However, there is a crying need for extension of all the above projects and for the immediate prosecution of a great many more investigations already approved. These include an extensive study of the chemotherapy of wounds and burns, a search for new drugs for the treatment of malaria and other tropical diseases, studies on wound healing, on the medical aspects of chemical warfare and additional research into the physiology of high altitude flying, leading to the greater effectiveness and well-being of our aviators. As time goes on and new questions arise, new projects will be initiated.

At the present time, some of the committees have completed the tasks set before them, while other committees have not yet been called on to any extent. But all are prepared for future demands and can be called whenever necessary. The structure as given here is not final and other committees will be organized when the need or request comes.

STRATEGIC MINERALS IN WAR AND PEACE[1]

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IT has become the custom to speak of minerals as strategic when they are necessary for war and when they must be secured in whole or in part from abroad. Despite the general abundance of mineral supplies in the United States, it is necessary to import substantial quantities of manganese, chromium, tungsten, tin, mica, nickel, antimony, quartz crystals, industrial diamonds and some varieties of graphite and asbestos. Some of my listeners may wonder why such things are essential to war effort.

The answer is, in brief, that modern war is a mechanized war, and all these materials are needed in the process of mechanization, and on a larger scale than ever before. Raw materials are required in intricate combinations. Alloys are playing an ever larger role. The absence of a single constituent, even though used in small quantity, may have far-reaching and disastrous effects on industrial operation. While only a few pounds of manganese go into a ton of steel, there are no satisfactory substitutes, and it is impossible to make this ton of steel by established metallurgical practice without the manganese. Every one knows that the machinery of modern war requires steel in huge quantities.

The list of strategic minerals is not a fixed one because, as the scale of preparation for war expands, shortages appear in other minerals. Already shortages are beginning to appear in certain minerals not on our strategic list, and, judging by the experience of the last war, still others will come.

The strategic mineral problem now occupying so much of the attention of the government agencies engaged in preparing our national defense is that of acquiring necessary reserves to carry the country through an emergency in case supplies are cut off from outside sources, while at the same time keeping industry supplied for its current needs.

First, it is necessary to estimate the amounts needed. This is a difficult problem because of the continuous expansion and shifting of war plans. Allowance must be made for increased amounts of these minerals which

[1] Radio address from Station WMAL, Washington. The address was brought to the fifty-third annual meeting of the Geological Society of America meeting in Austin, Texas, December 27, 1940.