

**OFFICE OF THE SURGEON GENERAL
UNITED STATES AIR FORCE**

**Report of the Medical Service
1 July 1949 — 30 November 1949**

[EXCERPTS]

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Maj. General Malcolm Grow's Summary Report

1. Under authority of the National Military Establishment Transfer Order 36, 1949, as implemented by Joint Army—Air Force Adjustment Regulations 1—11—62, 16 May 1949, the Medical Service, U.S. Air Force, with the Surgeon General, U. S. Air Force, as the head thereof, was established by Air Force General Order No. 35, 8 June 1949.

2. In compliance with the above regulations and order the Medical Service and the Office of the Surgeon General became functionally effective 1 July 1949. In the reorganization under the Surgeon General, the following principal positions, with appropriate functions, were established:

Deputy Surgeon General
Special Assistant to the Surgeon General
Chief of Dental Service
Director of Professional Services
Director of Plans and Hospitalization
Director of Staffing and Education

Formerly the subdivisions of the Air Surgeon's Office consisted of several divisions and branches organized on a functional basis.

3. The reorganization was of necessity based on estimates of what was considered to be the probable scope and character of the workload and it was necessary to effect this reorganization as quickly as possible. It must be borne in mind that much of the work

now handled by the Surgeon General of the Air Force was formerly accomplished by the Surgeon General of the Army. In taking over these functions it was difficult to accurately estimate organizational and personnel requirements.

4. It will require time, study and practical experience to fit the organization to the task, and arbitrary or hasty decisions in reducing the number of divisions or branches should be avoided. Detailed reports of the status of the work of these various divisions and branches, as of 30 November 1949, will be found in the appendices of this report and, for the sake of brevity, will not be discussed in detail in the body of the report.

5. The following problems appear from a broad viewpoint to be the most urgent:

a. Shortage of Medical and Dental Officers:

All support possible should be given by the Air Force to correct this condition by rendering the Medical Service attractive and by a continuing drive for the procurement of this class of personnel. While the shortage of dental officers is not as serious as that of medical officers, continuing efforts along lines of procurement will be necessary.

b. Shortage of Other Medical Personnel:

The personnel situation in other allied medical categories, such as the Nurse, Veterinary, Medical Science, and Women's Medical Service Corps, is much better and should continue to improve until full requirements are met.

c. The Air Force Reserve Medical Program:

The Air Force Reserve Medical situation is not good and a great deal of effort in organization, planning, procurement, assignment, and training of personnel will be required. It will be noted that all medical reserve matters have been previously handled by the Army exclusively, and insofar as the Surgeon General of the Air Force or the over—all Air Force Reserve planning is concerned, this is a new and unfamiliar field.

It is hoped that as appropriate and practical organizational structures and funds are provided, this service can be made more attractive to both officers and men of the Air Force Medical Reserve. It was originally proposed to have a small but strong Medical Reserve Branch or Division under the Directorate of Staffing and Education, composed of reserve medical officers on extended active duty. This proposal was disapproved by higher authority. At present one regular officer is assigned to planning reserve activities and, while he has been most efficient, it is felt that the scope and importance of this work cannot be adequately handled by one officer.

It is still the opinion of the undersigned that several active and interested reserve officers are badly needed to execute the large amount of planning necessary to develop this program and, in addition, it would seem advisable to have one of these men in the field part of the time making personal contacts. At the moment it appears that the Air Force

Medical Reserve program is in worse condition than any of the functions of the Surgeon General's office. Basic planning must be closely coordinated with the Air Force Reserve program and cannot be delegated to the Continental Air Command. That organization apparently cannot handle basic plans and should, therefore, serve as an action agency.

d. Medical Planning:

With the establishment of the Air Force Medical Service it was apparent that a great amount of work was necessary in forming basic policies and procedures upon which to develop plans for the organization and integration of all phases and echelons of medical service into Air Force mobilization, logistic and operational planning. Prior to 1 July 1949, the major part of planning for medical support required by the Air Force was the responsibility of the Surgeon General of the Army. Consequently, the methods utilized by the Surgeon General of the Army in determining requirements for the type, assignment, deployment, and utilization of medical units, personnel, and facilities followed those concepts applicable to ground force operations, which are in many respects inflexible and incapable of adaptation to Air Force operational needs.

There are now in process of development new Air Force Medical TO&E units considered necessary to provide medical support for the Air Force, as indicated by analysis of Joint Chiefs of Staff policies and Air Force mobilization and logistic plans. A great amount of work will be necessary to accomplish this task, and close contact with all Air Force interested staff agencies must be maintained. In addition, these plans must be coordinated with the Army and the Navy and, to a lesser degree, with civilian defense agencies.

e. Air Evacuation:

As evacuation of the sick and wounded by air is now the primary approved method, and this task has been turned over to the Air Force, a great deal of integrated planning with the sister services is necessary for not only peacetime operations but more particularly for planning in the event of an emergency, at which time this function may become enormous.

f. Medical Materiel:

The development of light medical equipment especially designed for airborne transportation is being carried out at the Armed Services Medical Procurement Agency and should be pushed forward as rapidly as possible. The first TO&E organization to be so equipped should be an Air Force dispensary; secondly, a 100—bed hospital should be developed. When developed and approved, sufficient of these units should be procured for the equipment of the Strategic Air Force. This development should receive a high priority.

g. Hospitalization:

Most of the Air Force hospitals are of World War II type construction. Many of the permanent pre-war hospitals are too small to handle the expanded contemporary Air Force base personnel, but some of these hospitals lend themselves to expansion by the addition of wings. In the last year the permanent hospitals at Scott Air Force Base, Mitchel Air Force Base, and Chanute Air Force Base have been taken over by the Air Force for administrative purposes. The Chanute Air Force Base hospital, as an illustration, was one of the best permanent hospital structures in the Air Force and could have been enlarged sufficiently to carry the workload. It is understood that it has been stripped of equipment and is undergoing rather extensive alterations which may render it unsuitable for hospital use. This is believed to be a mistake as the temporary hospital is in very bad shape and will be an increasingly expensive unit to maintain.

Hospital building costs are very high and the problem of providing decent hospital facilities in the future is going to be most serious. It is urgently recommended that whenever possible these permanent hospitals be enlarged sufficiently to carry the load and be used as hospitals. Any other course will be extremely expensive and wasteful of funds. A tight control of these hospitals should be maintained by the Installations Division of the Air Force Headquarters and efforts by Commands to convert them to other uses should be prohibited. (See Tab E.)

h. An Aeromedical Center:

Three years prior to the establishment of a separate medical service for the U. S. Air Force efforts were initiated to establish a medical facility for the Air Force which combined in one institution (1) aeromedical research, (2) aeromedical education and training, and (3) the practice of aviation medicine, which would serve as a means of effectively attacking the numerous medical problems peculiar to military flying. Such an institution has been commonly referred to as an "aeromedical center" and it was conceived of as necessary to provide a medical service for flying personnel which does not now exist, nor does it duplicate any function now being performed by any existing institution either military or civilian.

The necessity of an aeromedical center for the Air Force has been carefully considered by the Committee on Medical and Hospital Services of the Armed Forces and has received the full indorsement of that Committee. On 24 March 1949, the then Secretary of Defense, Mr James Forrestal, approved the recommendation of the Committee on Medical and Hospital Services and the Secretary of the Air Force instructed to assume the responsibility for initiating necessary action.

JAFAR 1—11—62, 16 May 1949, paragraph 2 b (3) states as follows: "The Department of the Air Force will...plan, administer, operate, and exercise policy control over base level and troop unit medical attendance within the Department of the Air Force world—wide; research and development in aviation medicine; and the aeromedical program, including an aeromedical center."

On 24 May 1949, the Office of the Air Surgeon was given the responsibility by the Assistant Vice Chief of Staff, U. S. Air Force, for planning for the establishment of the proposed center. On 21 June 1949, a planning board was appointed with Brigadier General Otis O. Benson, Jr., MC, as the Chairman, and instructed to "make studies of and recommendations concerning the establishment of an aeromedical center for the U. S. Air Force". This Board submitted a preliminary report to this office on 1 September 1949, and its final report is expected to be completed by 1 January 1950.

At the present time, and for many years past, the death rate of pilots in the Air Force from aircraft accidents alone is over five times that of comparable ground personnel from all causes combined. Of these accidents approximately two-thirds are attributable to failures in the human element and thus at least potentially amenable to reduction through an improved aeromedical program. Studies of human failure in the operation of aircraft have not been pursued with vigor due to lack of proper, up-to-date facilities and trained personnel.

In addition to the loss of life and limb, the economic factor in aircraft accidents is becoming of major importance. Almost without exception the death of a pilot in an aircraft accident is accompanied by the total destruction of the aircraft concerned. In 1947, the value of Air Force aircraft destroyed from all accidents amounted to over \$129,000,000, of which approximately \$84,000,000 resulted from accidents resulting from human failure. Such losses, which are a serious drain in peacetime, would pyramid in time of an emergency and reach catastrophic levels.

Available information indicates that an aeromedical center cannot be located on Randolph Field, the site of the present USAF School of Aviation Medicine, which would form the nucleus for such a center, due to lack of adequate space. The best location for such an installation has not as yet been determined but should be governed by (1) proximity to civilian medical centers; (2) central location with reference to Air Force activities; (3) central location in relation to Air Force flying personnel center of population; (4) favorable climatic and flying conditions; (5) favorable general environment; (6) separate air base; (7) possibilities of expansion; (8) economy of operation; and (9) vulnerability to enemy attack.

In the interest of economy, and considering the time that could be saved, the aeromedical center should utilize existing suitable facilities if such can be made available. However, if a suitable facility is not available, or one exists but at an unsuitable site, then serious consideration should be given to new construction since to compromise beyond reason could result in neither economical nor efficient operations.

In view of the current unacceptable death and injury rate of flying personnel and loss of expensive flying equipment due to causes which are, at least in part, preventable through the establishment of an aeromedical center, it is my considered opinion that this project be given the very highest priority.

Signed

MALCOLM C. GROW
Major General, USAF (MC) (Retired)

DIRECTORATE OF PROFESSIONAL SERVICES
OFFICE OF THE SURGEON GENERAL
Report of Aviation Medicine Division

Psychological Medicine

Concomitantly with the organization of a separate Air Force Medical Service a new branch was established within the Aviation Medicine Division to be known as the Psychological Medicine Branch. A detailed study of the number of psychiatric casualties occurring within the Air Force during the past war revealed an alarming increase in incidence over that of World War I. A group of expert civilian neuropsychiatrists and psychologists have been called in as consultants to the Surgeon General, and basic plans have been formulated which have as their aim three main purposes, namely:

1. To prevent psychiatric breakdown of flying personnel by improved screening methods during selection and training phases
2. Improve the standards of motivation and attitude
3. Improve the methods for detection, classification and proper management of psychiatric casualties when they do occur; this to the end that they may be more expeditiously treated and returned to active or combat duty

This program for the prevention of unwarranted numbers of psychiatric casualties in the event of another armed conflict is considered essential to the preservation of Air Force manpower. Immediate plans call for the assignment of a well-qualified neuropsychiatrist to provide greater amplification and further development of this branch, but to date such help has not been obtainable.

During the past war, the Air Force introduced and developed an entirely new concept and system for the rehabilitation of casualties. The system, under the able guidance of Dr. Howard Rusk, was quickly adopted by the Army and the Navy and is now becoming increasingly popular in the larger civilian medical centers.

Aviation Physiology

During the past war the Air Surgeon recognized the urgent necessity for more detailed training of all crew members in the physiology of flight. Approximately 65 low-pressure

chambers were procured and placed throughout the United States and overseas to assist in a training program designed to teach the crew member the importance of good oxygen discipline, the proper fit and care of all of his personal flying equipment, bailout and ditching procedures, the importance of good night vision, the prevention of frostbite and many other things, all designed to contribute to the health, safety, comfort, and efficiency of our aircrewmembers.

Immediately subsequent to the war, and the very rapid demobilization that followed, this program came to a complete standstill. Most of the Aviation Physiologists engaged in the teaching of this program were Doctors of Philosophy, obtained from the larger medical centers in the United States, and they all returned to their civilian occupations. Most of the low-pressure chambers were placed in storage but many were unprotected from the elements and, in the years that followed, became almost unserviceable for any further use.

With the more recent developments in aircraft with operational ceilings far above 40,000 feet, and with speeds transcending the sonic barrier, it became more apparent than ever that, if our pilots and other crew members were to survive at these altitudes and speeds, this training program should be reinstated.

Because of the extreme dearth of Medical Corps officers and the complete absence of any Aviation Physiologists on duty with the Air Force, a plan was devised to utilize the services of rated pilots as instructors for this program. To this end a group of 14 volunteers were obtained and given a very intensive ten weeks course of instruction at the USAF School of Aviation Medicine.

The program to refurbish the low-pressure chambers and place them in operation again has been a very slow one, beset with innumerable delays. The delay has been occasioned mainly by lack of sufficient funds and the low priority afforded the program. Approximately one year after the inception of the program, a total of only four chambers were in operation. By 30 November 1949, it is expected that a total of six will be operating, that a total of nine will be operating by 1 January 1950, and, finally, that our present total requirement of thirteen chambers should all be operational by 1 March 1950. All low-pressure chambers have been classified as U. S. Air Force Headquarters controlled items of equipment, and intermediate plans call for reconditioning all chambers on hand so that they will be ready for installation and use if and when required by a national emergency. Immediate plans call for the operation of a total of thirteen chambers, distributed by Command as follows:

Air Training Command 7
Strategic Air Command 3
Continental Air Command 1
Military Air Transport Service 1
Headquarters Command 1
(Bolling AFB)

The utilization of pilots as instructors for the Air Force Physiological Training Program (See AFR 50-27) was another effort on the part of the Surgeon General to relieve Medical Corps officers of all but their essential technical duties. With further development of the Air Force Medical Reserve Program, it is planned to provide Mobilization Day assignments for all Aviation Physiologists for duty with Physiological Training Units. This will then relieve the presently assigned rated pilots for more essential combat duties in the event of hostilities.

As a further contribution towards this educational program, an Air Force Regulation entitled "Aeromedical Aspects of High Altitude and Supersonic Flight" has been published as AFR 160-49. Current technical orders and regulations have been published which place this program on a firm basis.

Organizational plans call for the utilization of a civilian physiologist to head the Aviation Physiology Branch; however, to date this position has not been filled.

The Care of the Flyer Program

During the past war [World War II] this program was developed by General Malcolm C. Grow, and the functions of this program are contained within a branch of the Aviation Medicine Division now known as the Air Crew Maintenance Branch. This branch is charged with maintaining, and improving the physical health, morale, flying proficiency, and safety of all flying personnel. The problems stem back originally to the times when crewmen were needlessly killed or injured because of lack of adequate safety belts and oxygen equipment, when they were being injured by flak because they had insufficient personal armor, when frostbite caused loss of limbs because of inadequate protection from the cold, and men were handicapped by inadequate rations for in-flight use. These and many other factors inherent and peculiar to Air Force operations pointed the way to a need for an agency to have as its primary concern the solution of all these problems.

Rapid strides were made during the war in the development of more adequate and efficient oxygen masks, emergency bailout equipment, devices designed to protect the wearer from the adverse effects of high positive "G" forces; rapid strides were made toward the development of a satisfactory body armor for flyers, as well as countless other items of personal protective equipment.

The old Army canned "C" rations have now been replaced by a new in-flight meal known as the IF-2 ration which is canned in 6-ounce containers with a very wide range of items to suit all tastes, and many new and delicious products have been added which provide a well-balanced meal. This program to develop a more satisfactory in-flight menu has been carried on by several agencies, such as the office of Maintenance, Supply and Services under the Deputy Chief of Staff, Materiel, Headquarters, U. S. Air Force; the Aero Medical Laboratory; the Quartermaster Food and Container Institute; and has been closely monitored by the Surgeon General. The improvements in methods of preparation of food, heating, storing, and serving have kept pace with this program. A program involving the installation of galleys aboard medical air evacuation planes, utilizing the

precooked quick frozen meal is presently under way. Special Air Force arctic and tropic survival rations have been developed and are presently undergoing service testing.

So important are the safety accouterments that accompany flight operations that the Aviation Medicine Division, at the request of the Surgeon General, U.S. Air Force, has within the past five months exerted considerable pressure to reinstitute and revitalize the Personal Equipment Program at unit level, and to obtain the services of a personal equipment officer who would assist in the monitoring of a program for the proper use, care, and procurement of protective and emergency equipment. Stiff opposition, because of resistance of the Director of Programming Control to the establishment of any additional programs which require the use of officer personnel, has precluded the use of such an officer per se.

However, as part of our Aircrew Maintenance Program, the Aviation Medicine Division as of 1 December 1949, is continuing to monitor a program in the development, testing and procurement of protective and personal equipment, such as: Escape Equipment (parachutes, ejection seats, bailout oxygen systems); Altitude Defense Equipment (oxygen system, including normal and pressure breathing, partial pressure suits, equipment used in explosive decompression studies); Equipment Affording Protection Against Accelerative Forces ("G" suits, prone-position beds); Air-Sea Rescue and Survival Equipment (life rafts, life vests, immersion suits, survival rations); crash helmets, flying clothing, and body armor.

Immediate plans call for the erection of an Ejection Seat Training Tower at Williams Air Force Base to be used to provide more adequate indoctrination of aircrewmembers in the maintenance and proper use of ejection seats. Organizational plans call for the assignment of a pilot-flight surgeon to this branch who would spend a great deal of time in the field on periods of temporary duty with the various major commands, flying the various types of aircraft in use in the Air Force, and making a first-hand, detailed study of aeromedical problems peculiar to each type of operation. It was intended that this officer would in some small measure, by performing strictly Care of Flyer duties and activities in the field, be filling a gap presently occasioned by the dearth of flight surgeons at base level.

As a long-range plan, it is hoped that eventually at least one pilot-flight surgeon can be trained and assigned to each tactical unit as a Wing Surgeon.

DIRECTORATE OF PROFESSIONAL SERVICES
OFFICE OF THE SURGEON GENERAL
Report of Medical Research Division

Developmental and organizational status of Air Force Medical Research as of 30 November 1949, is as follows:

1. Performing the research and development necessary to insure the most effective utilization of manpower is a major problem confronting the Air Force Medical Service. All medical research and development in the U. S. Air Force is, and will continue to be, focused on the human factor in military aviation.

2. Medical research and development is presently being conducted at the USAF School of Aviation Medicine, Randolph Air Force Base; the Aero Medical Laboratory, Wright-Patterson Air Force Base; the Arctic Aeromedical Laboratory, Fairbanks, Alaska; Muroc Air Force Base, California; Eglin Air Force Base, Florida, and by contracts with various universities throughout the country.

3. The USAF School of Aviation Medicine is engaged in research to discover ways of improving the efficiency, health and safety of Air Force personnel. The organization of this laboratory is integrated into a unit capable of applying the various medical and allied sciences to problems of more efficient manpower utilization. This organization has been found too limited in numbers of personnel to adequately attack the increasingly complex problems associated with military aviation. Plans are recommended for increasing the number of research scientists in the immediate future. A new Department of Space Medicine and a Department of Clinical Psychology have been established.

Planning is under way to organize the School into a cadre for the proposed Aeromedical Center, which will be expected to greatly augment the research effort on problems of more efficient personnel utilization and assessment of personnel throughout their military careers. It is hoped thus to gain a broad, flexible organization capable of accomplishing the research required to keep the Air Force Medical Service abreast of technological advances in modern air warfare, and to allow us to maintain Air Force personnel at a peak level of health, efficiency and endurance.

4. The Aero Medical Laboratory is engaged in research to discover ways of adapting the designs of aircraft, instruments, controls and accessory equipment to meet human limitations and requirements. The professional staff of this laboratory is unable to meet the increasing demands for its services. A new unit has been established in the Psychology Branch to conduct research on radar, communication and weapons systems. Plans for increasing the number of professional personnel of the laboratory are under consideration for the immediate future. In the intermediate future it will be desirable to further increase the number of research personnel at this laboratory who will be working on human engineering problems.

5. The Arctic Aeromedical Laboratory was organized to furnish to the Air Force a research establishment capable of accomplishing research on personnel problems arising from conditions of the Arctic environment. It was also planned to thus establish a facility for testing equipment and techniques under arctic environmental conditions. Personnel and facilities are still inadequate. Plans to establish permanent buildings and equipment

are being considered. Long range plans are to establish at this laboratory a research and testing facility capable of supplying answers to the human problems connected with flying operations in the arctic.

6. The units at Muroc Air Force Base and Eglin Air Force Base were established primarily to test the operational usefulness of equipment and devices which have evolved from experimentation at the other laboratories. It is recommended that future plans be evolved to stabilize these units as compact but efficient testing organizations, and to facilitate the operational analysis of research recommendations presented by other research agencies.

7. The investigations initiated and carried out in the above laboratories stem from problems related to flying, or from problems of personnel who are associated with military aviation. Being mindful of the sources for the monies for research and development in a medical field, it is considered proper that research efforts be directed only to the solution of Air Force problems directly applicable to the national defense. With this concept and policy, each program will continue to be reviewed in the light of its possible and probable value to military aviation.

Present status of relationships with the Air Staff, with other Departments, and with the Office, Secretary of Defense:

1. The medical research program is designed not only to supply answers to problems arising from the medical service of the Air Force, but also from requirements brought to the attention of the Surgeon General by the various Air Staff offices. Efforts are continuously being made to keep the Air Staff informed of the medical research program in order that we may ascertain whether or not the overall military requirements for medical research and development in the Air Force are being met, and to stimulate submission of research requirements to the medical research facilities by the Air Staff.

2. Close coordination between the medical research program and the research and development programs of the other two departments is constantly maintained. Such close coordination and liaison are required to prevent duplication of research effort between the departments, and to assure that the defense program of the military establishment is securing the proper research and development support. It is recommended that increasing emphasis be placed on joint sponsorship of research programs by two or more of the interested departments. It is believed that such a procedure will allow the medical research program of the three departments to undertake a comprehensive and thorough attack on problems of joint interest.

3. Participation of representatives of the medical research program, both from this Headquarters and from the field laboratories, is maintained on the various cognizant committees and panels of the Secretary of Defense, Research and Development Board. The Research and Development Board is fully informed of all medical research programs and projects and future plans for research. In turn, medical research programs are planned

and projects are initiated in accordance with guidance and program planning of the Research and Development Board.

Research programs and recommended plans for research on problems of high altitude:

1. The requirements for pressurization of aircraft are defined by the need for oxygen and the prevention of decompression sickness. The hazard of explosive decompression up to 40,000 feet for airmen in pressurized aircraft is well delineated. Above this altitude our knowledge of these factors is incomplete. The use of pressure breathing above this altitude is limited to emergency or short time use. Data on decompression sickness incidence are virtually non-existent although the effectiveness of preoxygenation is well known. A partial pressure suit and oxygen equipment assembly have been developed which protected an X-I pilot, during August, at a very high altitude, when the cabin pressurization failed. Procurement of 500 of these assemblies is now under way.

Flight tests have been completed on the first model Bendix liquid oxygen converter of an 8-liter capacity. Flights with this converter were conducted up to 35,000 feet, using a standard B-17 aircraft. Average duration of the flights was two hours and seven or eight crew personnel were used on each flight. Entirely satisfactory operation was realized in all cases.

Disposable oxygen masks have recently been developed for use in transport and air evacuation type aircraft.

2. In the immediate future research must continue on the development of more satisfactory oxygen and pressurization equipment. Long range investigations to determine the physiological aspects of flight above 40,000 feet have been initiated and must continue. Research efforts must be concentrated on developing satisfactory methods, equipment and protective devices for maintaining flying personnel at combat efficiency, and for permitting them to escape safely from the aircraft the Air Force will desire to employ in the intermediate future because of their vastly raised ceilings and increased speeds. Long range research must continue during peace time to delineate the problems involved in flight at extreme altitudes and possibly through outer space, and to discover solutions to these problems.

Research programs and recommended plans for research on problems of high speed flight:

1. Human tolerance to high acceleration has been extended by recent research and development on the supine and prone positions, on G suits for positive G, and on protective helmets for negative G. Much has been learned about the ability of the human body to withstand various high G forces of short duration. In August 1949, there were six highly successful human ejections using the ejection seat in the T-80. Personnel involved in these ejections were medical researchers, and one of the ejections was from an airplane traveling at 565 miles per hour. These recent human experimentations have proven that

the ejection seat is practicable for escape from fast-moving aircraft. The deceleration track at Muroc Air Force Base is now ready for human experimentation to determine the effect of high magnitude deceleration on man. Results to date have proven that man can take as much as 40 forces of gravity for brief periods without harmful effects.

2. Other associated but important factors concerning high speed flight are the effects of gusts and buffeting, wind friction with its resultant heating and the effects of high frequency vibration on **man**. An important problem associated with high speed and high altitude flight is that of pilot vision from aircraft for target recognition and landing purposes.

3. In the immediate future research must continue on the problems of seat ejection and the effects of G forces on short duration. In the intermediate future research should include investigations of the problems involved in capsule ejections, ultrasonic vibrations, prone and supine positions with concomitant control problems. Long range research should be pointed toward including research on self-propelled escape missiles, flight in gravity-free states, location and recognition of targets appearing as point sources of light against the black sky of the outer atmosphere, and other problems related to flight at extremes of altitude and speed.

Research programs and recommended plans for research on problems of equipment design:

1. Psychological and physiological investigations are continuously bringing into focus those factors in designing cockpits, instruments, controls, etc., to meet human limitations which permit greater ease, accuracy and reliability of operating aircraft and accessory equipment. More than thirty research projects are in progress and many others are planned for the future to discover ways of simplifying aircraft instruments and controls, of developing more rapid means of presenting information by voice or visual communications, of increasing the effectiveness of radar scope presentations and traffic and air defense control operations, or preventing aircraft accidents, and other vexing problems associated with military aviation.

2. In the immediate and intermediate future research should continue on design problems as new equipment is developed to insure that human limitations of the operator are adequately considered. A more direct and efficient means for presenting research results and recommendations to design engineers in readily usable form should be devised. Research must continue on the standardization and simplification of instruments and controls. We must increase the simplicity of instrument use and positioning. Further advances must be made in seating and positioning design to improve safety, efficiency and comfort. Improvement of cabin lighting, instrument legibility and decreased obstruction to vision must be sought as speed of flight increases. More adequate insulation from noise and protection of hearing efficiency must be acquired.

3. Long range plans must continue research on the above problems as they relate to more advanced equipment designs. Additional research effort should be made available

to the solution of design problems as the complexity of Air Force equipment increases, and as aircraft performance approaches the limits of human tolerance and capability.

Research programs and recommended plans for research on problems of care of aviation personnel:

1. The factors which are found in the problem of the care of aviation personnel in military aviation are those which involve first, the determination and maintenance of the physical fitness and highest degree of human efficiency in all of its aspects-- mental, physical, psychological and physiological and, secondly, the protection of such personnel from the stresses and hazards associated with military aviation activities.

Research is underway on health hazards encountered in exposure to natural environmental stresses, such as are encountered in arctic, desert, tropic and sea survival situations. Other research deals with stresses having characteristics peculiar to aviation and the military situation, such as health hazards encountered in exposure to propellants and combustion products, vibration (including sub and ultrasonic), exposure to ionizing radiation and thermal burns, extremes of temperature, and crash and ditching problems.

2. A new drug for air sickness has been extensively evaluated and found to be moderately effective. Plans are under way for effectively screening approximately ten anti-motion sickness drugs within the next three months.

Extensive studies are under way by medical researchers on methods for evaluation and improvement of safety procedures and equipment for handling air evacuees during in-flight emergencies, including crashes, escape, and survival.

Approximate human limits of tolerance for hot cockpits have recently been defined after extensive studies, and a suit for fire fighters has been developed which will permit actual entrance into a crashed burning aircraft and will provide insulation against temperatures up to 2,000 degrees Fahrenheit.

A performance physiology laboratory has been established at the USAF School of Aviation Medicine within recent months to develop suitable techniques and measurement of those aspects of fatigue that influence the effectiveness of human operators in performing various tasks involved in flying.

Extensive work is planned at the Arctic Aeromedical Laboratory, Fairbanks, Alaska, during the coming winter by the University of Washington Medical School on studies of human acclimatization to cold. Research is being conducted to discover the attitudes and morale problems of personnel stationed in the Arctic.

3. Immediate and intermediate future plans should continue research on problems mentioned above. Research effort should be increased on problems of special environmental stresses and hazards with emphasis on the development of methods and equipment for preserving human tolerance to the environmental demands. Long range

plans should be directed to the discovery of those factors important to the health and efficiency of aviation personnel in faster and higher flying aircraft and the hazards associated with space travel.

Research programs and recommended plans for research on problems of selection and training of aviation personnel:

1. The continued experience of many failures in training, the war records of the many who were unable to face or carry through in combat, and particularly the extent of neuropsychiatric breakdown in aviation personnel indicate that these are problems to be pushed and emphasized in the foreseeable future.

Research is under way on the physical and psychological selection of personnel for the increasingly complex aircrew jobs. A recent important development has been the formation of the Surgeon General's Advisory Committee on Psychiatric Screening, which is composed of military personnel and outstanding psychiatrists and psychologists of the country. A Department of Clinical Psychology has also been established at the USAF School of Aviation Medicine.

Many personnel problems in the Air Force require evaluations of individuals' personalities by psychiatrists. Frequently large numbers of individuals must be examined in a short space of time. When examination of large numbers of personnel becomes necessary there is an urgent need for supplementary diagnostic techniques and personality screening tests, which are now being developed by the USAF School of Aviation Medicine to supplement psychiatric examination.

2. In the immediate future the research effort of the Clinical Psychology Department of the USAF School of Aviation Medicine should be augmented on the problems of neuropsychiatric screening through increased personnel authorizations. Research should continue at least at the present level in other areas.

3. In the intermediate future research should be conducted to discover and delineate the factors involved in the task of operating a modern aircraft and accessory equipment with a view to improved selection and classification of personnel.

4. Long range plans should include a complete analysis of Air Force jobs with the goal of career-wide selection and classification and career guidance. The Aeromedical Center should be assigned the task of periodically performing a complete assessment of all Air Force personnel. Plans are recommended for a network of psychological clinics to be located in all major Air Force command hospitals for purposes of performing follow up research on psychiatric selection problems, and of assisting in the rehabilitation and adjustment of Air Force personnel to the military environment.

As the result of a study conducted by the Secretary of the Air Staff, it has been recommended that the medical intelligence activity of the U. S. Air Force, at present the responsibility of the Surgeon General, U. S. Air Force, be transferred to the Directorate of

Intelligence, U. S. Air Force, and that the number of Air Force persons engaged in medical intelligence be considerably augmented.

Pending action on this recommendation, the Medical Intelligence Branch of the Medical Research Division, Office of the Surgeon General, U. S. Air Force, is continuing to brief and debrief air attaches, to coordinate the collection and production of medical intelligence with such other agencies as the U. S. Navy, the Central Intelligence Agency, and the U. S. Army, and to maintain files of pertinent documentary material. Because of the shortage of personnel, actual production of aeromedical intelligence is at a minimal level.

The Technical Information Branch has as its principal functions:

1. Collection and dissemination of information from sources within the Air Force, as well as from other agencies within the Department of Defense, government agencies and authorized organizations, research centers, etc.

2. Professional and security review of papers intended for publication in professional periodicals.

3. Preparation of speeches for members of the Air Force Medical Service to be delivered before both professional and nonprofessional groups.

4. Preparation and issuing, through proper channels, of news releases, feature articles, etc., of the activities and accomplishments of the Air Force Medical Service.

In order to establish a clearcut picture of present activities and plans for the future, each, function will be treated separately.

Collection and dissemination of information:

1. The Technical Information Branch maintains liaison with other information offices throughout the Department of Defense and other Government agencies, such as State Department, U. S. Public Health Service, and the National Institutes of Health. In addition, this branch is establishing a close relationship with the information offices of private organizations, universities, and research centers. This exchange of information should and will be developed to a greater extent than at present. This branch should be the distributing agency of information to the field, to government agencies, and to private organizations and research centers.

2. It is important that this branch become the central source of information from the Office of the Surgeon General. This serves two purposes: (1) members of the Air Force Medical Service have a direct channel which they may use for the dissemination of information, and (2) agencies on the outside become acquainted with a source of

information within the Office of the Surgeon General and direct all business to one source.

Professional and security review:

1. To date, professional review of papers has been accomplished quickly and efficiently, a policy which must continue. The name of the reviewer is never revealed to the author or authors, and possibly it would be well to have the names of the authors remain anonymous as well. Papers have been returned for rewriting or further consideration on the advice of the reviewer. This is a policy which should be continued, as the professional attainments of the Air Force Medical Service will be judged to a great degree by the quality rather than quantity of literature.

2. With respect to the future, it seems that in addition to the professional review and security clearance, editorial revision as to continuity, grammar and style should be centered in this branch. It is felt that this branch should have a section which would carry out editorial revision of professional papers. As every editor knows, and too few authors realize, a manuscript has a much better chance of being accepted for publication if it is typed neatly, if the English is correct, if the thoughts are well presented throughout, and if the illustrations are correctly cropped and identified. At the rate of the present flow of papers, one well-qualified editor would be sufficient.

Preparation of speeches:

To date, speeches prepared in this branch have been only of the general type. As the Office of the Surgeon General, U. S. Air Force, becomes more widely known, it is expected that its members will have more opportunities to deliver speeches. This function presents no problems either now or in the future.

Preparation and issue of news releases, feature articles, etc:

1. The U. S. Air Force Medical Service is a new service. It is necessary that our activities and accomplishments become widely known, especially in the medical, nursing, dental, and other allied professions, all of which are part of the medical team. In the last analysis, the public pays our salaries, grants appropriations and, to all extents and purposes, is our boss. If we are known and respected we shall have support. Every opportunity which the Air Force Medical Service has to present itself to the public should be exploited to the fullest.

2. The officer shortage is acute and will remain so unless doctors of medicine can be assured that they may pursue a professionally satisfying career. At present, because the Air Force Medical Service has the newsworthiness of novelty, the Technical Information Branch and assigned personnel are much more in the press than are our brother organizations of the Army and the Navy. This is not meant to be a comparison, for as the novelty wears off we shall need additional personnel with which better to tell our story. The Public Relations program is, of necessity, a long-range program.

**DIRECTORATE OF PROFESSIONAL SERVICES
OFFICE OF THE SURGEON GENERAL**

Report of Preventive Medicine Division

Organization

The division is organized into six branches, of which one is fully staffed (Veterinary Branch). Two are partially staffed (Preventable Disease Branch and Environmental Sanitation Branch), and three (Biological Defense, Health Indoctrination, Epidemiology) are carried as additional duties by the division as a whole. Additional personnel have been requested but are not approved at this time. This shortage of personnel prevents proper discharge of functions and seriously interferes with accomplishment of short and long range plans. The personnel shortage is equally severe at field installations.

Health of the Air Force

The excellent state of health of the Air Force continues. The absence of epidemic influenza, the mildness of common respiratory disease, and the decrease in prevalence of other common communicable disease accounts, to a great extent, for the improved health of the Air Force. Injuries are the major cause of time lost from duty, while common respiratory disease leads the communicable disease group. The changing pattern of disease in America (which is reflected at Air Force installations throughout the world), and the advent of antibiotics makes it difficult to forecast the future health of the Air Force. Striking improvements noted in the past in the health of America have often slipped markedly as drug resistant organisms become common, or the prevalence of uncommon disease becomes greater.

Immediate Plans

At the present time, revision of existing directives on the control of disease as well as initiation of several new directives to meet the changing pattern mentioned above is in progress. Where possible this is being done as a joint Army-Navy-Air Force project. In all cases the basic concept is compatible to the three services, although administrative actions may vary. The Veterinary Branch is assuming its new responsibilities. Directives on Mess Sanitation, Human Nutrition, Rabies, and Veterinary Service, U. S. Air Force, have been prepared. Indoctrination

of Veterinary Officers in the field is underway through formal training, a conference of command veterinarians, and an operating procedure for Base Veterinary Service. The division is maintaining membership (full or liaison) with more than fifty medical boards, panels, committees, etc.

The military forces have always had a reputation for the finest preventive medicine in the world. Today this reputation is not deserved as many civilian communities have preventive medicine programs that are far better than those maintained by the military services. This is due primarily to our shortage of medical personnel to carry out the broad program necessary. Specific examples are the lack of a cancer control program in the military, our disregard of health education in the curriculum of the dependent schools operated by the military, and our lack of an organized maternal and child health program in the overseas military communities where dependents should expect the same standards of medicine as would be furnished them if they lived in a civilian community in the United States.

Intermediate Plans

Most pressing in the intermediate plans of the division is an integrated program for the medical aspects of defense against atomic, biological, and chemical warfare. This is in the intermediate group because of a lack of personnel to immediately institute the program.

The integration of certain veterinary activities into the overall preventive medicine program is under way (the mess sanitation program is the first objective and next is a program concerned with control of animal reservoirs of human disease, and then the broad field of food borne disease, including design of equipment to facilitate sanitary operation and improve present methods of sanitizing).

A broad program of health education is considered essential and is placed in this group only because of the lack of personnel to initiate such a program. It is hoped in the next four years to superimpose on a broad basic program of preventive medicine specific disease control programs aimed directly at specific diseases causing large amounts of lost time, i.e., streptococcal disease, pneumonia, cancer, tuberculosis, infectious hepatitis, etc.

These specific programs will vary as annual reports of the health of the Air Force show changes in the importance of the various diseases.

Long Range Plans

Long range plans for the division visualize, first, the procurement and training of adequate numbers of personnel to place qualified specialists in

preventive medicine at major command level, ZI, and overseas, with the training of junior officers at station level. Training in a civilian institution for all preventive medicine officers is essential and rotation through several types of activities, i.e., Air framing Command, Air Materiel Command, and Strategic Air Command, is necessary to provide well-grounded personnel.

It is anticipated that our sanitary engineers will be cross-trained in industrial hygiene engineering through both graduate civilian training and on-the-job experience in the Air Materiel Command.

It is hoped that all veterinarians in key positions can be trained in preventive medicine, particularly the epidemiology and animal-borne diseases, nutrition, and mess sanitation.

The actual program envisioned in the next eight years is nebulous. Recent advances, such as the antibiotics, ACTH, and now the antihistamines, may well change our concept of preventive medicine and greater efforts spent in improving efficiency of the normal (illumination, noise, nutrition, clothing, mental hygiene, etc.).

**DIRECTORATE OF STAFFING AND EDUCATION
OFFICE OF THE SURGEON GENERAL
Reserve Program**

Under authority of Joint Army and Air Force Adjustment Regulation 1-11-62, 16 May 1949, at their own request and by direction of the Secretary of Defense, effective 1 July 1949, there was transferred from the Department of the Army to the Department of the Air Force the following Reserve Medical Service personnel:

Medical Corps	--	981
Dental Corps	--	552
Veterinary Corps	--	55
Air Force Nurse Corps	--	301
Medical Service Corps	--	935
Women's Medical Specialist Corp	--	18
Total Officers		2,842
Total Enlisted Personnel		394

The following Air Force Reserve medical personnel were calculated as required for the support of the current Air Force Reserve:

Medical Corps.....	3,380
Dental Corps.....	1,943
Veterinary Corps.....	445
Air Force Nurse Corps.....	2,630
Medical Service Corps.....	1,704
Women's Medical Specialist Corps	113
Total Officers.....	10,215
Total Enlisted Personnel.....	25,963

Prior to 1 July 1949, the Department of the Army was responsible for furnishing medical service to the Air Force. Likewise, the Department of the Army was responsible for instituting a program of training for the medical reservists. At the end of the second World War, the Air Force did implement a reserve program for all departments of that service except medical, because as stated above, until 1 July 1949, that responsibility was relegated to the Department of the Army.

On 22 July 1949, the Secretary of Defense directed the Armed Forces Medical Advisory Committee to undertake a complete study of the Medical Civilian Components Programs of the Armed Forces. To facilitate the assembly of basic data required by the Medical Advisory Committee for this study, there was established within the Medical Services Division, Office of Secretary of Defense, a Committee on Medical Civilian Components Programs of the Armed Forces. Dr. Raymond B. Allen, then Director of Medical Services, established a group on Medical Department Civilian Components Programs of the Armed Forces, who were charged with preparing and submitting to the Director of Medical Services a report on the current Medical Department Civilian Components Programs of the Armed Services. This included the ROTC, NROTC, NG, ANG, and the Army, the Navy, and the Air Force medical programs. That report was completed and submitted to Dr. Allen about 1 September 1949.

About the same time, the Surgeon General, U.S. Air Force, called a meeting at the Continental Air Command of all surgeons of major commands and numbered Air Forces, at which time those in the Continental Air Command charged with the responsibility of implementing the medical reserve program, briefed the Surgeon General on the status of the medical reserve program.

Following the Surgeon General's meeting at the Continental Air Command, it was decided to assign a medical officer to the Plans Division, Office of the Surgeon General, U. S. Air Force, who would study the needs for a medical reserve program and recommend to the Director of Plans and Hospitalization methods of implementing the program.

After a comprehensive study of the Air Force regulations pertaining to reservists and study of the Air Force Fiscal Year 1950 program, a letter was sent by the Surgeon General to the surgeons of all major commands and numbered Air Forces stating the needs of a medical reserve program, and enlisting their comments and recommendations relative to a medical reserve training program.

Following that, a medical officer was ordered to the Air Reserve Association meeting at Long Beach, California, where he had the opportunity to speak with several of the Commanding Generals, major commands and numbered Air Forces, as well as Wing and AFRTC Commanders of the Reserve Units, in regard to the difficulties encountered in getting the required number of medical personnel to activate their reserve medical units. Without exception, they all expressed the opinion that the reserve medical officers especially were just not interested. Some of the reasons given for disinterest were:

1. A feeling, in many cases, that there had been improper utilization of and recognition of professional skills during the past war.
2. The belief that any reserve program would not place sufficient emphasis on medical professional activities.
3. The belief that professional personnel are often given wartime appointments in higher grades than individuals of equal qualifications who have earned their grades through reserve participation.
4. The necessity for professional people to concentrate their efforts on their civilian practice.
5. The reluctance to attend the proposed Air Force reserve medical units training, which necessitated their presence on Saturdays and Sundays.

In other words, the Organized Reserve program as then proposed by the Air Force for training medical reservists was wholly inadequate as shown below.

The total officer positions for corollary units of the Air Force Reserve authorized for Fiscal Year 1950 is 6,945, of which 88 positions of that total are authorized in corollary units for Medical Service personnel, or 1.2% of the aggregate officer corollary strength. The total AFRTC officer positions is 3,528; total Medical Service officer personnel for AFRTC units is 350, or 9.9%.

Of the seven medical corollary units authorized only two are active, and of the 25 Medical Groups authorized in AFRTC units only eight medical officers

have so far been assigned, and none of them have ever had enough assigned personnel to be classified even as Class C.

During the Fiscal Year 1950, there were approximately 12,350 paid mobilization assignments available for Air Force reservists. To date only 23 positions in the Continental Air Command have been assigned to Medical Service personnel. There are two reasons for the small number of mobilization assignment positions filled by Medical Service personnel; first, Medical Groups organized under TO&E 1-9012, Column 5, are authorized 14 officers and 67 enlisted men. The war and peace tables for this unit are the same. There is no T/D, or it is so small as to be negligible for mobilization assignment purposes. Second, at the time the mobilization assignment positions were allotted to the major commands and numbered Air Forces, no Medical Service was in existence in the Air Force; therefore, no positions were earmarked for the Medical Service.

In October 1949, it was recommended at least one officer (MSC, preferably reserve on EAD) be assigned to each of the numbered Air Forces and the Continental Air Command be charged with the sole responsibility of implementing the reserve program. Six such officers were transferred from the Department of the Army to the Department of the Air Force and now have been assigned as recommended, to report not later than 5 January 1950.

A regulation authorizing short tours of EAD for doctors and dentists has been approved and will be published shortly. This regulation will allow base commanders to call to active duty, for one to twenty-nine days, such doctors and dentists as are needed to aid the base surgeon in accomplishing his job. It is expected that this regulation will greatly augment the Medical Service, especially during this critical period.

At the present time plans are under way to organize volunteer units in all cities of 10,000 population and above where at least ten reservists can be brought together. These units will then serve as a pool from which officers and enlisted men can be drawn to augment corollary units.

A study is now under way to establish corollary units on all Air Force hospitals, beginning with those in the Strategic Air Command. In order to do this, it will be necessary to delete from the Fiscal Year 1950 program some Air Force corollary units which are either inactive or ineffective.

The Medical Service Plans Division of the Surgeon General's office is presently engaged in making up TO&E's for hospitals, dispensaries, and cellular units. As soon as the TO&E's are accepted, plans will be made to activate reserve units based on M-Day requirements.

It has been recommended that correspondence courses be prepared for those reservists who either are unable or unwilling to participate in an active reserve organization. It is believed the courses can be made attractive and will, to some degree, keep the reservist informed of Air Force medicine.

Plans are also being formulated to establish short courses of instruction for reservists who may be able to leave their civilian occupations for as much as two weeks at a time.