Middle Articles

R.A.F. Medicine—The First 50 Years

J. A. HOPSON,* B.M., B.CH., D.OBST.R.C.O.G.

[WITH SPECIAL PLATE BETWEEN PAGES 50 AND 51]

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The Royal Air Force Medical Branch was founded in 1918, and, like the rest of the Air Force, celebrates its fiftieth anniversary this year. During the early days of military aviation medical care of R.F.C. personnel was the responsibility of the R.A.M.C.; similarly, members of the R.N.A.S. were cared for by R.N. medical staff. The medical officers concerned were loaned by their parent service, and expected to return to it after a tour of duty at a flying station. There was little interchange of knowledge between the Services and virtually no appreciation among the more senior medical staff of the many medical problems associated with the operation of military aircraft. Indeed, in 1915 the Admiralty actually issued an order forbidding R.N. medical officers to fly in aeroplanes.

Early Days

The creation of an Air Force Medical Service was not without opposition. The Government had set up in 1917 a committee, under the chairmanship of the eminent Edinburgh surgeon Sir Watson Cheyne, to consider the formation of an independent Air Force Medical Service. In summarizing their reasons for supporting the formation of such a service, the Watson Cheyne Committee stated: "Aviation presents new physiological and pathological problems which require special study and which can only be dealt with satisfactorily by a specially trained body of men."

Unfortunately the views of the Watson Cheyne Committee met with considerable opposition. There was a marked reluctance, and even obstruction, on the part of the other two Services to the suggestion that the Air Force should have its own medical service. Instead of a completely independent medical service, Air Force medical matters were to be controlled by a committee composed of the Directors-General of the two senior Services, the Vice-president of the Air Board, the Secretary of the M.R.C., a physician, a surgeon, a neurologist, a physiologist, and two medical officers from the Air Force called the Medical Administrator and the Assistant Medical Administrator. This arrangement was to continue for the duration of the war. The Royal Air Force was founded on 1 April 1918. Seventeen days later Air Ministry Weekly Order 76/18 decreed that medical officers who were on loan to the Royal Air Force and employed exclusively with the R.A.F. units were in future to be the responsibility of the Air Force Medical Department.

Inevitably the vitality of an organization stems from the enthusiasm and dedication of the individuals forming that body. The Air Force Medical Department was fortunate in having among its members a group of particularly dedicated personalities; among those of 1918 C. B. Heald figures prominently. Following a crash in France in 1916 Heald was

posted back to U.K. as a member of the First Special R.F.C. Medical Board. This board, the forerunner of the Central Medical Establishment, was set up to assess the fitness or otherwise of candidates for aircrew training and of officers who, although trained, had become temporarily unfit through illness, injury, or operational stress.

Aviation Medicine

The study of aviation medicine started in earnest with the establishment towards the end of 1917 of a Medical Flight at Hendon. The purpose of this new organization, working in conjunction with the staff of the Applied Physiology Laboratory at Hampstead, was to test flying clothing and oxygen equipment and to examine some of the medical aspects of flying training. It was found that many trainee pilots who experienced difficulty with landing also suffered from a degree of ocular muscle imbalance. A scheme of orthoptic training devised by Dr. E. C. Clements was introduced for these men, and it was claimed that as a result 82% of them were able to undertake full flying duties.

Research undertaken during the period between the wars included a continued examination of visual problems associated with aviation, design of close-fitting flying-helmets to provide protection from the effects of prolonged exposure to engine noise, and study of techniques necessary to overcome the effect of acceleration on the human body. Much of this latter work was of value to the winner of the Schneider Trophy Competition in 1929.

Towards the end of 1938 the Flying Personnel Research Committee, composed of eminent physiologists and doctors connected with aviation, was set up to advise the Government on medical aspects of research affecting the safety and efficiency of aircraft and flying personnel. This committee is still in existence and continues to offer advice of considerable value to both Service and civilian aircraft operators.

In 1939 the Medical Flight and associated laboratory moved to Farnborough, where research facilities were much better, the combined unit being renamed the R.A.F. Central Physiological Laboratory. Much of the early work at Farnborough was concerned with the physiology of respiration and visual problems in aircrew. Later experience showed the need to examine other problems associated with aviation, and the scope of studies undertaken was rapidly extended. What started out in 1917 as a small research unit has grown into what is now, as the R.A.F. Institute of Aviation Medicine, the largest laboratory in Western Europe concerned with research in environmental medicine.

The R.A.F. was fortunate at the end of the war with the appointment of the officer to command the newly designated Institute of Aviation Medicine at Farnborough. Air Vice-Marshal W. K. Stewart, as he eventually became, a graduate

* Squadron Leader, R.A.F. Medical Branch.

of Glasgow University, joined the R.A.F.V.R. in 1939, and after a short spell on a flying station was posted to Farnborough, where he remained until his tragic death in May 1967 at the age of 51. Stewart's early work at Farnborough involved him in an extensive programme of flying experiments in which he, as the subject, cheerfully accepted the unknown risks of testing his body to the limit, never considering that he was doing anything out of the ordinary.

Stewart's work at Farnborough included not only the development of escape systems from aircraft, and a study of oxygen for use at high altitudes, but also the establishment at the R.A.F. Institute of Aviation Medicine of a closely knit team of doctors and other scientists dedicated to the attempt to make air and space safer for human travel. Many able men have contributed to the work of the R.A.F. Institute of Aviation Medicine, but few would disagree with the comment by Sir Bryan Matthews that it was Stewart's "spirit and example which set the tone of quiet but searching integrity in its conduct."

R.A.F. Hospitals and the Nursing Services

As the R.F.C. and associated medical services developed it gradually became accepted that injured or ailing aircrew returning from operational or other flying duties were best treated together, and by doctors and staff who had an interest in and knowledge of their particular problems. The first hospital for flying personnel was set up in 1917 at Hampstead, where patients of both R.N.A.S. and R.F.C. were treated by a joint naval and military staff. The first R.A.F. general hospital was opened in 1919 at Halton, where a large station had been established housing the Air Force Apprentice Training School. Similarly, for most of the first world war the nursing of sick and wounded flying personnel was carried out by members of the Queen Alexandra's Imperial Nursing Service. In June 1918 a separate Air Force Nursing Service was formed, and in 1923, having become fully established as a permanent branch of the R.A.F., changed its name by Royal Consent to that of Princess Mary's Royal Air Force Nursing Service. Today the R.A.F. has a total of 10 hospitals; four are overseas in Singapore, Bahrain, Cyprus, and Germany; six are in the U.K. These hospitals are fully equipped and manned to deal with most common major medical and surgical problems, and between them provide a total of nearly 1,700 beds.

Specialist Medical Services

Specialist medical officers of the early R.A.F. were almost all derived from either the R.A.M.C. or the R.N. Medical Service. Employed at either the Specialist Medical Establishment or in the R.A.F. hospitals, they were not known as consultants until 1930. At this time consultants were appointed for medicine, surgery, pathology, neurology, ophthalmology, and otorhinolaryngology; a consultant post in applied physiology was established in 1936.

During the second world war many eminent civilian consultants offered their services to the R.A.F., and many distinguished men from civilian life hurried to assist the R.A.F.

Since the end of the war the pattern of illness treated by R.A.F. medical officers has changed considerably. Illnesses like pulmonary tuberculosis are less common than they were, and are nowadays controlled by modern treatment, while the care of the Serviceman's dependants has brought an entirely different population under care, with a corresponding change in the type of illness seen. Last year, for example, nearly 5,700 babies were delivered in R.A.F. maternity units, while 3,500 gynaecological operations were carried out during the same period.

Yet another recent change concerns the postgraduate training offered to R.A.F. medical officers. Several R.A.F. hospitals now provide medical officers with recognized training for the postgraduate examinations of the Royal Colleges: other medical officers undergo training at the R.A.F. Institute of Aviation Medicine before sitting the examination for the Diploma in Aviation Medicine.

Medical Rehabilitation

During the early part of the second world war, when there was an acute shortage of fighter pilots, it was found that by the use of special rehabilitation units where essentially physiotherapy and occupational therapy were required, not only was pressure relieved on acute hospital beds but the patients recovered more rapidly than they often did if left in hospitals for acute cases. Under the leadership of Group Captain C. G. S. O'Malley this process was introduced, and by 1941 rehabilitation had become accepted as a necessary part of the treatment of traumatic injuries, burns, and many other medical and surgical conditions. Patients were grouped into classes of similar injuries at about the same state of repair; schemes were devised to take classes progressively through a series of exercises, beginning with the simplest and ending at a stage at which strenuous team games could be attempted. Close medical supervision was maintained to prevent patients from attempting more than was wise at their particular stage of recovery, and considerable ingenuity was needed to devise exercises which were both helpful and interesting.

Since the end of the war the work of the R.A.F. medical rehabilitation units has been based in Surrey at R.A.F. Chessington and R.A.F. Headley Court. In April this year the R.A.F. Medical Branch assumed responsibility for the medical rehabilitation of personnel in all three fighting services.

Pathology

The first Air Force pathologist was Major H. E. Whittingham, a medical officer seconded from the R.A.M.C. in 1917 to work as a pathologist at the R.F.C. Officers' Hospital at Hampstead. In 1925 the Central Laboratory moved to its present home at Halton, and Whittingham was appointed Director. In 1941 Air Marshal Sir Harold Whittingham became Director-General of Medical Services. He more than any other individual was responsible for the magnificent medical service which developed during the war and for the organization which enabled the many eminent civilian consultants to utilize their clinical knowledge and experience to the greatest effect.

During the last few years R.A.F. pathologists have undertaken an intensive study of the traumatic pathology found in aircraft accidents. This study, begun at the time of the original Comet disasters, has been found so valuable that nowadays an R.A.F. pathologist is usually present whenever a formal inquiry is held to consider the cause of a fatal accident involving British civilian or Service aircraft.

Civilian Co-operation and Research

Though the R.A.F. Medical Branch exists primarily to cater for the needs of a military service, assistance is willingly made available to civilian personnel and organizations whenever possible. In the U.K., for example, civilian patients are admitted to R.A.F. hospitals as and when beds are available. Overseas R.A.F. medical officers work among the indigenous population, often providing the only medical facility for hundreds of miles; the recent award of the Wilkinson Sword of Peace to R.A.F. Gan recognized in part the work undertaken by R.A.F. medical

personnel during two recent outbreaks of typhoid among the population of the Maldives.

The R.A.F. Medical Branch has throughout the last 50 years worked in harmony with the various civilian organizations. On the aviation side a close liaison is maintained between the research workers at the R.A.F. Institute of Aviation Medicine and civil aviation industry; on the clinical side R.A.F. medical officers readily co-operate with pharmaceutical firms in testing the efficiency of their products in the closed confines of a Service community.

Research has always formed a major part of the activities of the R.A.F. Medical Branch, and though the emphasis has inevitably been placed on aviation medicine, the clinical side has not been neglected. One of the first safe and efficient electro-diagnostic stimulators to be manufactured in the U.K. was developed on behalf of the R.A.F. Other R.A.F. electromedical research has included the development of an air transportable renal dialysis unit and the design of both A.C. and D.C. defibrillators, now being tested by intensive care units in hospitals in the U.K. Other recent clinical research includes work undertaken at the Hyperbaric Oxygen Unit at Princess Alexandra's Royal Air Force Hospital, Wroughton, the Hypertension Unit at R.A.F. Hospital, Cosford, and the Renal Unit at Princess Mary's Royal Air Force Hospital, Halton. The results of R.A.F. medical research have always been made freely available to the civilian community in the past and this policy will continue in the future.

Casualty Evacuation

At the time of the formation of the R.A.F. any Serviceman serving abroad who was unfortunate enough to be injured would be moved to hospital by road or rail, often a slow and uncomfortable journey that aggravated his discomfort. If his injuries demanded repatriation to the U.K. he faced a long and arduous journey by ambulance, train, and troopship. Nowadays the situation has changed completely; a Serviceman injured in the Far East can be flown back to hospital in this country in a matter of hours; he will travel in a pressurized jet aircraft flying above weather, and be nursed by an experienced team of nursing officers of the P.M.R.A.F.N.S. and R.A.F. or W.R.A.F. Air Ambulance attendants.

The first recorded British air ambulance flight was on 19 September 1917, when an injured trooper of the Imperial Camel Corps, with a compound fracture of the ankle caused by a bullet, was flown out of the Sinai desert in the observer's seat of a

D.H.4; the journey took 45 minutes instead of the usual three days in a camel litter. Later modifications were made to other aircraft so that stretcher patients could be carried, and slowly but surely special techniques were developed for moving patients by air. By the time the second world war had started about 3,000 patients had been transported in R.A.F. aircraft.

From these modest beginnings developed the Casualty Evacuation Service, which was to prove its worth in every theatre in the second world war. Over 400,000 casualties were carried by the British Air Forces during that war, some of the flights being undertaken in perilous conditions from exposed forward airstrips. Aircraft that had brought troops and supplies up to the front line returned to base areas with patients; whenever air support of troops was possible aeromedical evacuation was available. To this day the R.A.F. has no aircraft restricted to the ambulance role; all passenger aircraft and many freighters, too, can be used if necessary for aeromedical evacuation purposes.

The aeromedical service now operates between the U.K. and all overseas stations as well as within this country. Routine flights return to the U.K. two or three times a month and special flights are provided when necessary. Even patients who require continuous artificial respiration or peritoneal dialysis can be safely and speedily transported in R.A.F. aeromedical aircraft. These facilities are available to all Servicemen and their families, and provide a welcome reassurance to many. Last year over 3,000 patients were carried by air, and included several babies only a few hours old who were flown back to this country for urgent surgical treatment of serious congenital defects.

The medical officer in Palestine who loaded the injured soldier into the DH4 could not have imagined that 50 years later there would be a routine air ambulance service covering all parts of the world.

Conclusion

In 1918 the R.A.F. Medical Branch was staffed by officers from the R.N. Medical Service and the R.A.M.C. Though the offspring now differs in many respects from its parents, co-operation between the three medical branches of the armed Forces has never been closer. Much common policy is decided by interservice consultation, and this tendency is likely to continue. Development of the medical services has been rapid during the past 50 years. The R.A.F. Medical Branch is proud of its past and looks forward to its future.

CONFERENCES AND MEETINGS

Ninth International Leprosy Congress

[FROM A SPECIAL CORRESPONDENT]

The Ninth International Leprosy Congress was held at the Imperial College of Science and Technology in London from 16 to 21 September. The nineteen sessions of the Congress covered a broad field ranging from experimental work and epidemiological studies, through prophylaxis and treatment, to the practical realities of leprosy control programmes. At the first session on experimental leprosy Dr. C. C. SHEPARD (National Communicable Diseases Center, Atlanta) described recent work following his earlier

discovery—made eight years ago—that leprosy bacilli would multiply locally after inoculation into the foot-pad of a normal mouse. After an initial latent phase of about 100 days the bacilli multiplied logarithmically, reaching a total of about 1 million before the immune response of the mouse was sufficiently stimulated to control the infection. The regularity of this process provided an experimental model for testing the activity of chemotherapeutic agents and for carrying out immunological studies. The immune

response was enhanced in mice well immunized with B.C.G., so that multiplication of *Mycobacterium leprae* was halted at an early stage. On the other hand, crippling immune reactions by thymectomy and whole body irradiation allowed multiplication to reach much higher levels.

Dr. R. J. W. Rees (National Institute for Medical Research, Mill Hill) said that thymectomy plus irradiation allowed *Myco. leprae* to spread from the foot-pad into other tissues. Moreover, intravenous inoculation

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D.H.9 air ambulance, Somalia, 1919.

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Vickers "Vimy" ambulance, 1924.

Visit by King George VI to Institute of Aviation Medicine, Farnborough, 22 July 1940. Left to right: Air Marshal (later Lord) Tedder; King George VI; J. J. Llewellyn (Minister of Aircraft Production); A. A. Hall, Director, Royal Aircraft Establishment (now Sir Arnold Hall, F.R.S.); A. Swan, Deputy Director, Air Force, Royal Aircraft Establishment; Bryan Matthews, F.R.S. (now Professor Sir Bryan Matthews); Air Marshal Sir Victor Richardson, Director-General Medical Service; W. G. A. Perring, Deputy Director, Royal Aircraft Establishment; Wing Commander Lowe, Commanding Officer, Army Corps of Flying, Farnborough; and Acting Air Vice-Marshal Harold Whittingham (now Air Marshal Sir Harold Whittingham).

The "walking wounded" from the two ambulances climb aboard a Dakota Normandy, 1944.

Britannia air ambulance