

detailed enough to be informative. More extensive information was obtained in a survey conducted by the Laboratory Animals Bureau in 1952. This survey depended on the voluntary co-operation of the relevant laboratories, but as about 80 per cent replied, the results are reasonably representative. The material has already been analysed by Lane-Petter with particular reference to the procurement of experimental animals, and it is now analysed again in this book by Russell and Burch from the point of view of their use.

It must be admitted that it is a rather incoherent body of data and its defects are indicated (as Dr. Russell admits) when 108 canaries of Lane-Petter's report reappear in the present analysis as 72 ducks. However, it is the best available, and its inadequacy suggests that the best and most economical use of animal resources does not receive as much attention as it deserves. The rest of the book deals with this problem in terms of replacement of the whole animal by a physical or chemical system, a tissue culture, or a preparation of an isolated organ; reduction of the numbers needed by avoiding quantal observations and other extravagant designs and by good environmental control; and refinement of technique in choosing suitable species, responses and methods of approaching a problem.

All these approaches are desirable and useful, but must be considered in the light of the particular problem which it is necessary to solve experimentally. It is useful to have a résumé of ways which have already been adopted to make experimentation as humane as possible, and so this book is in some ways supplementary to the well-known UFAW handbook on the care of laboratory animals. It is not sufficiently informative to be used as a guide either to details of experimental design or to the husbandry of experimental animals. Perhaps its chief purpose is to stimulate thought on both these topics, and it is to be hoped that it will succeed in doing so.

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## U.S. ARMY NEUROSURGERY IN THE SECOND WORLD WAR

*Surgery in World War II. Neurosurgery, Vol. I* Colonel John Boyd Coates, Jr., M.C., Editor in Chief (Medical Department, United States Army). Prepared and published under the direction of Major General S. B. Hays. Pp. xix+466. (Washington, D.C.: Government Printing Office, 1958.) 5 dollars.

A HISTORY of surgery in the Second World War is in course of preparation by the Medical Department of the United States Army. Two volumes are devoted to neurosurgery. The first of these has been published and deals with the organization of the neurosurgical services and the care of head injuries at all stages after wounding. The second volume will deal with spinal and peripheral nerve injuries.

The first volume is edited by Drs. R. G. Spurling and Barnes Woodhall, contains 466 pages, and is beautifully produced and illustrated. Although fourteen authors have contributed sections, there is little overlap between these, and the quality of almost every section is extremely high. The early chapters are concerned with the planning and

development of neurosurgical services in the United States itself, and the European and Mediterranean theatres, and reveal what can be achieved by excellent organization. Thus the nine neurosurgical centres set up in the United States in August 1942, each with 150 beds, had increased in two years to nineteen, each with 350-500 beds, and within another year certain of these hospitals had 2,000 beds. Although a programme of training for military neurosurgeons was instituted early in the War, it is no surprise to hear that it was at times difficult to find what was considered to be the appropriate medical personnel for these numerous centres, in particular at the ward officer level. When the demand for neurosurgeons overseas developed, the problem of distribution of personnel was at times difficult. The assistance of organic neurologists would have been invaluable but their scarcity in comparison with neuropsychiatrists rendered such aid quite infrequent. The contributions of the consultant neurosurgeons in disseminating knowledge through visits, newsletters and conferences were invaluable. In all theatres of operations it was believed that neurosurgeons could be most profitably employed in evacuation hospitals 15-20 miles from the front, the patients being transferred to neurosurgical centres some days later.

The greater part of the volume is given over to the consideration of therapy in the head injuries of modern warfare, and contains several outstanding contributions. In one of these the modern management of missile wounds of the head receives detailed consideration. The post-operative fatality rate in several groups of patients treated by such techniques was approximately 14 per cent, another 12 per cent of the patients reaching hospital after a head injury dying without treatment. These figures give eloquent testimony to the success of the plans for treating neurosurgical casualties and the skill of those who carried them out.

Another excellent contribution deals with post-traumatic epilepsy. Almost 250 patients were submitted to a carefully planned study. In 55 per cent, seizures were controlled medically for a minimum period of four months; 17 per cent were lost to the investigation and in 28 per cent the attacks remained uncontrolled. Two-thirds of the latter group of 66 patients were treated surgically. From the early results it is considered that surgical measures may have a limited place in the management of post-traumatic epilepsy which does not respond to medical measures.

Other articles deal with pathological aspects of missile wounds, blast concussion, infective complications of brain wounds and ventricular penetration by missiles, as well as the repair of skull defects. Perhaps the only omission is a discussion of the rehabilitation and resettlement of patients with brain wounds. Such a section would have completed the story of the group of patients so fully considered from other points of view.

This contribution to the history of surgery in the United States Army in the Second World War is a very valuable one. It is a fascinating account of the development of the Army neurosurgical services and their utilization during the greatest of wars. Moreover, it provides in readily available form detailed information which will be invaluable to those concerned in the development of a military neurosurgical service in the future, should the need for this arise.

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