only means of physical medicine employed after the lesson of Sir Robert Jones had been so quickly forgotten at the end of the first world war. About 20 years ago, Moore of Crewe began to bring us back to more realistic methods of rehabilitating injured workers, and finally in 1938 Nicoll of Mansfield established this method of treatment on a firm practical basis. During the recent war this method tended to be overdone and to push actual physiotherapy into the background, but since that time a better balance has been struck between work in a gymnasium and the work of the physiotherapists. We now realize that a combination of these two methods is the ideal.

This book describes the methods of electrodiagnosis and treatment by specialized equipment, but these have little interest to the doctor in industry. The physical methods of treatment, however, are of very great interest to the industrial medical officer. Section 3 is especially to be recommended as it deals with orthopaedics, and treats in a general manner such subjects as posture, which is so important, especially in young adults, as the maintenance of correct posture can add so much to the happiness and efficiency of the worker. The chapter on foot faults is also excellent and should be studied by every medical man who has control of workpeople. After discussing the mechanics of the foot it shows how simple physical remedies can correct painful deformities, and this is especially important as many of these methods can be applied in an industrial medical department.

Section 6 deals with rehabilitation and resettlement. The general principles laid down should be studied and known by every industrial medical officer so that he can cooperate with the hospitals and ensure that there is no break between the time of completing treatment and the resumption of work. Much can be done by the industrial medical officer if he keeps in close touch with the hospital and understands the case thoroughly so that he can make the job fit the disabled person. The Vauxhall rehabilitation workshop is an example of this type of coordination, and its working is fully described. This type of work can, of course, be done most effectively in a large organization, but the principle can be applied in smaller workshops.

This book contains much good material intelligently written, and gives a balanced picture of the conditions that can be treated by physical methods. It is easily read and the reader does not feel overwhelmed by detailed discussions on particular conditions.

There are, however, many references for the reader who wishes to go more deeply into any aspect of this vast subject.

J. CRAW

Researches on the Measurement of Human Performance.

Since the end of the war much has been published on studies of psychological problems in the armed services. Most of the work done has been concerned with the techniques of selecting recruits, or rather sorting them out into the appropriate training classification. This report, however, covers a different field, by describing laboratory investigations of several factors affecting the efficiency of certain operational groups.

As the war proceeded a number of important problems arose in connexion with human efficiency. If a radio operator in a warship under the stress of battle conditions were to misread a message or to transmit a message inaccurately, the fighting efficiency of the ship might be seriously impaired, with far-reaching and serious consequences. In his book, The Ship, C. S. Forester describes the many conflicting interests that have to be resolved by the naval architect. The physical comfort of the crew in their operational stations generally takes a low place in the list of priorities, and yet it may play an important part in the overall efficiency of the fighting unit.

To what extent is efficiency impaired by adverse climatic conditions in an operational room? What happens to men who are required to watch or listen for hardly distinguishable signals occurring at unpredictable intervals? The author has examined these problems scientifically, in order that some of the conditions essential for a high level of human performance may be based on precise information and not on vague ideas or speculation.

The report is divided into two parts, the first concerned with tests of vigilance, the second with the effects of environmental conditions upon performance at certain tasks.

In a number of operational situations a radar operator is required to observe the radar tube continuously in order to detect the presence of submarines. The specific problem was to ascertain whether these men were performing efficiently, or whether long uninterrupted periods of watch were liable to lead to the operator missing the signal in the radar tube. The apparatus used for testing consisted of a clock dial with a pointer. The tip of the pointer moved every second, and at long and irregular intervals it moved double the normal distance. Trained observers were seated in front of the dial and required to press a key whenever they saw the double movement. The number of occasions on which they failed to observe the double movement (the stimulus) was observed under varying conditions. These variations in conditions included the following: four continuous spells of half an hour; alternating spells of half-hour work and half-hour rest; half-hour work spells followed by two half-hour rest periods; preceding the period of watch by special briefing; giving the subjects knowledge of success or failure; administration of benzedrine; and changes in the atmospheric conditions.

A somewhat similar set of experiments was carried out on a synthetic radar apparatus, and on another apparatus in which the stimulus was auditory instead of visual.

The main conclusions were of considerable practical importance though some could hardly be called surprising. After the first half-hour subjects missed substantially more signals, but by alternating half-hour periods of watch with half-hour periods of other work this decline could be avoided. When the subjects had knowledge of their success the deterioration was reduced and even a telephone message in the middle of the test
spell produced a temporary improvement. Benzedrine had the effect of improving performance. Under conditions of high temperature accuracy decreased.

The second part of the report deals with tests to assess the effect of different environmental conditions on efficiency at different operations. In one set of experiments the effects of non-lethal war gases on performance at various tasks were investigated. It was found that on the whole arsenical smoke was not a handicap to physical efficiency, though in tasks requiring accurate visual perception there were wide individual differences.

A further group of men were required to perform various operations—a pull test, a pursuit-meter test and a wireless telegraphy test—under various controlled conditions of temperature, humidity and air movement; i.e., in five different climatic conditions.

It was found that at certain temperatures (effective temperatures between 83 and 87.5°F.) men could not work effectively indoors, whether engaged in physical or on mental work. In tasks of skill the higher skilled men were less affected than the less skilled men. The relation between effective effort and period of work was examined under the different climatic conditions.

This report is a lucid account of a series of painstaking and detailed studies. It will be of interest to physiologists and to those interested in the psychological aspects of fatigue and skill.

H. G. MAULE

**Industrial Health: An Introduction for Students.**


This book is unique, for within little over a hundred pages the reader can find well informed and thoughtful comments on almost the whole content of occupational health. Information is provided on such matters as the distribution of manpower in Great Britain, employment of women and of young and old people, methods of assessing the health of a working community, the physical and social environment at the place of work, occupational diseases and accidents, and industrial legislation as it affects health. In spite of its small size, and in spite of possible criticism that it is cursory and that its simplicity may defeat its object, this book is a satisfying and effective contribution to our educational literature in this subject. It is well written and, as one would expect from the publisher, attractively produced. In any student of industrial health, stimulation of thought invariably should lead to an appreciation of the need to obtain more information. The next edition, therefore, might with benefit provide a more comprehensive bibliography than the present somewhat meagre ration.

D. STEWART