

Progress Report

1946

Directors

Dr KJW Craik (to 1945)

Professor Sir Frederic Bartlett, C.B.E., P.R.S., D.Sc., (Hon. Director)

Present Staff

Mr E. Farmer, University reader in Industrial Psychology

Mr E. G. Chambers, Research Assistant in Industrial Psychology

Miss M. D. Vernon

Dr Alice Heim

Dr D. Russell-Davies

Dr N. H. Mackworth

Dr W. E. Hick

Dr R. B. Buzzard

Mr J. W. Whitfield

Dr A. Carpenter

Miss N. Timpany

Miss J. Wallace

Miss V. Horn

Miss D. Archibald

Miss V. Batts

Miss S. R. Nxon

Mr L. P. Thomas

Attached to Ministry of Works for Building Research: -

Miss V. G. Stone

Miss M. M. Woodhead

Miss P. M.P. Hooper

Mr A. Gilbert

Miss P. King

At the time of the outbreak of the war the Medical Research Council had a number of workers stationed at the Cambridge University Psychological Laboratory. All of them became very speedily involved in activities strictly concerned in war-time National Service. As this work grew in range and in practical importance it became necessary to reinforce the staff engaged upon it, and early in 1944, with the concurrence of the University the Council decided to establish a Unit for Research in Applied Psychology at Cambridge, and Dr. Kenneth J. W. Craik was appointed its first Director. His brilliant experimental abilities and his power of leadership led to rapid developments in many different directions. A year later Craik was killed in an accident. It was a most severe blow, but by now the Unit was well established and its work has continued with much success along the lines which he had marked out. The chief topics covered by the Unit during the war period were: -

(1) Personnel Selection for the Fighting Services and for Industry.

(2) Technical experimental studies, especially concerned with:

(a) the development of methods for determining the effects of certain Harassing Agents.

(b) the effects of certain drugs particularly of the benzedrine group.

(c) nutritional studies.

(d) experimental investigations of skill fatigue.

(e) problems of "display" and "control".

(f) accidents and accident prevention.

(g) rehabilitation studies.

1. PERSONNEL SELECTION

Immediately after the outbreak of the war Mr. E. Farmer made contact with the War Office and arranged for a large scale trial of methods designed to match the intelligence requirements of various branches of Army Service with the intelligence equipment of available recruits. At this stage the time officially allowed for this type of test was strictly limited and it was possible to use only somewhat abbreviated pen and paper tests of the verbal intelligence type and for the assessment of mechanical ability. Mr. Farmer was first assisted by Mr. E. G. Chambers and Mr. J. N. Hotopf and later by Mr. A. Rodger, Mr. J. G. W. Davies and Mr. E. Anstey. As this work developed it reached a stage when it was regarded as having passed beyond the phase of an experimental try-out and was ripe for very wide application. It was then placed under the direct control of a special War Office branch and several of the workers hitherto attached to the Laboratory were taken over by the Army. In the meantime the methods adopted by these Medical Research Council workers had resulted in the collection of much vitally important information concerning the range of intelligence required in a very large number of trades, vocations and professions of civil life. Some of this has been analysed and published in a paper by Mr. J. W. Whitfield and Mrs. H. Himmelweit referred to below.

In much the same way all the early personnel section tests and methods used by the R.A.F. were developed in this group. Initial verbal and mathematical tests of intelligence were devised and standardised by Mr. E. G. Chambers and were widely applied to Royal Air Force pilot candidates. These also in due course passed beyond the experimental stage, and, in a more completely developed form became an official concern of the R.A.F. itself.

Already before the war Group Captain G. C. Williams had been developing at Cambridge a possible mechanical performance test for air pilots. With much help from Mr. E. Farmer and Mr. E. G. Chambers he built up a sensory-motor instrument test which in the form known as S.M.A. 3. later became a standard test apparatus for air pilots throughout the whole Empire Flying Service. The first of these instruments was built through the Medical Research Council by Dr. E. Schuster.

Later such personnel selection as remained with the Cambridge group became much more highly specialised. For example, Medical Research workers shared in a highly successful development of special selection methods used to pick R.A.F. Control Room and Filterer personnel. A large scale investigation designed to study the possibility of selection based chiefly upon the assessments of qualities of temperament and character owed much to Dr. Russell Davis, Mr. E. G. Chambers and Miss M. D. Vernon.

Side by side with these Fighting Services selection problems went much similar work, directed principally by Dr. Alice Heim, which dealt with selection in Industry. Experiments were carried out at certain Labour Training Centres but, in spite of promising results, they received no fully national recognition. More practically effective were a considerable number of investigations conducted in various factories engaged upon war work. Not only was the technique of large scale intelligence testing much developed and some of its difficulties more fully realised and faced than had been common, but some noteworthy success was achieved with the practical operations of machine manipulation and with general inspection work. A beginning of some promise was made in the validation of selection methods for foremen.

2. TECHNICAL EXPERIMENTAL STUDIES

(a) Harassing Agents

Early in the war Dr. N. H. Mackworth, working at Porton established some new methods for assessing more accurately the psychological effects of Harassing Agents.

(b) Drugs

Dr. N. H. Mackworth and Dr. D. Russell Davis conducted experiments for all three of the fighting services which determined definitely the limits of usefulness of drugs of the benzedrine, pervitin, ephedrine group. On the basis of these, practical rules for the administration of the drugs concerned were drawn up and accepted.

(c) Nutritional Studies

Dr. I. Frankau and several assistants carried out specific experiments to determine the possible effects upon muscular and mental work of vitamin agencies. A positively favourable result on endurance, speed and

accuracy was established in some cases, but the mechanism through which these effects are obtained still remains doubtful. Later this group joined with the Sheffield Nutrition Unit in special studies. A full report is to be issued.

(d) Fatigue

Special attention was given to problems incidental to fatigue following upon long periods of highly skilled work. In this the Cambridge Cockpit, designed by Dr. K. J. W. Craik, and built at the Laboratory proved invaluable. Dr. D. Russell Davis was particularly responsible for demonstrating, in this connection, the essential temperamental basis of many of these fatigue effects and also of the related liability to accidents.

(e) "Display" and "Control"

Every machine presents signals for action which the operator must interpret, and possesses levers, switches, wheels and so on which he must manipulate in response to these signals. The general name for the first is "display" and for the second "control". If either is designed without regard to what the greatest number of ordinary operators can best do, a tremendous amount of inefficiency, fatigue, nervous strain, accidents and spoiled work are bound to follow. The problems which have to be considered are many and diverse, and require for their solution a combination of psychological, physical and engineering skills. Under the guidance of Dr. Craik these problems became more and more the main preoccupation of the Unit. They raise fundamental questions about perception, the mechanics of bodily movement, and the exercise of human judgement. Craik's own work covered all these fields, but was particularly influential in regard to a large variety of problems of visual adaptation, and particularly of vision under poor conditions of illumination. He was assisted throughout by Mrs. S. Macpherson and latterly by Dr. W. E. Hick. Dr. Hick has continued the study particularly of "control" problems. He has demonstrated the best kind of equipment to use with "jolting" conditions, has studied several problems of rifle aiming, has investigated a number of different tracking systems and has shown the effects of a varying resistance when steady winding is required. This work is actively continuing.

A number of visual studies, especially at the level of complex perception, was carried out by Miss M. D. Vernon, partly in collaboration with Dr. Craik and partly independently. Notable among this was a most fruitful investigation of the conditions necessary for the quick and accurate reading of dials and banks of dials. This study has already been applied to dial design in many directions.

Dr. N. H. Mackworth directed some studies which had an immediate practical effect on the design and equipment of R.A.F. Control Rooms, and towards the end of the war the same worker, together with Dr. J. W. Carpenter carried out extensive investigations which still continue, on the effects upon human behaviour of high temperature and humidity. This work is being done through the Medical Research Council for the Royal Naval Personnel Research Committee.

(f) Accidents and Accident Prevention

Mr. E. Farmer and Mr. E. G. Chambers have both continued their interest in the study of accident prevention. In general, lack of cooperation on the part of the central administrative authorities concerned has made it impossible to secure adequate conditions for properly controlled experiment or for the collection of the necessary statistics. However, work is still continuing with a rather better prospect of progress in the immediate future. As already mentioned, Dr. D. Russell Davis's studies of flying accidents had a more definite practical issue and towards the end of the war Mr. J. W. Whitfield, working mainly from a statistical angle introduced new methods of promise, especially in relation to a study of certain types of mining accidents.

(g) Rehabilitation

Dr. A. Heim and Miss A. Rennison began some studies of rehabilitation problems, first with the Birmingham War Injuries Unit and more lately with the South Wales Pneumoconiosis Unit. Dr. R. B. Buzzard, working first directly as an investigator for the Medical Research Council, and then later seconded by the Council to the R.A.F. carried out extensive and effective investigations into rehabilitation methods with returned P.O.W.'s and with Air Crews due for re-muster.

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