But in the process it has gone on to develop two points—the restriction of comment to the limited and particular group of the moment, and the independence of the research team—which surely are matters of research tactics, into principles which have guided and confined the entire study within the restricted bounds already described, and without which, its considerable value would have been still more enhanced.

It will of course be obvious that these remarks are to be taken in their context—of gratitude that here at last is a serious and indeed pioneering study of some of the least accessible features of human relations in industry.

D. H. ALLCORN


This book is based upon the work of the Nuffield Research Unit into Problems of Ageing during the period 1946-8. The Unit, led by Mr. Welford, has from its inception been attached to the Cambridge Psychological Laboratory, under the direction of Sir Frederic Bartlett. In a foreword the latter suggests that the Report should "be judged from two points of view: as a contribution to the fundamental psychology of human skill and of methods which make its accurate measurement or assessment possible, and as a study of the changes in skill which appear to be consequent upon increasing age". If this, however, is taken in conjunction with the opening sentence of Mr. Welford's introduction, where he says that "the studies described here have been conceived within the framework of the research on the measurement and analysis of human skill which was developed in the Cambridge Psychological Laboratory during the war", the reader is less likely to err in blaming the author for not doing what in fact he never felt obliged to do. This is not intended to be a treatise on the subject, with the Unit's findings integrated into the general body of relevant knowledge; it is a frankly Cambridge report, as evidenced by the fact that of a brief bibliography of 23 references, no less than 16 emanate from the Cambridge Laboratory.

Thus understood, the Report has considerable merit in several respects, both in content and presentation. If judged in terms of Professor Bartlett's criteria, and within the concept of the nature of skill advanced in the third chapter of the book, the work reported undoubtedly constitutes a further advance in methodology and provides a scientifically-derived corrective to several popularly-held notions about the effects of ageing.

Whether one is able to argue that it also contributes significantly to what is described as "the fundamental psychology of human skill" is perhaps very much a function of the reader's use of the word "fundamental". The emphasis on the relative importance of the central mechanisms of the receptor side over that of the effectors and of the peripheral mechanisms may have already appeared to psychologically-sophisticated readers as being a likely working hypothesis. That within the honestly-stated limitations of these studies this hypothesis seems best to explain the experimental findings is, however, a step forward. The language and diagrams of the text are in general commendably clear, with one or two glaring exceptions such as the sentence at the head of p. 148: "It must be emphasised that such analysis does not involve merely the taking of several different scores relating to the same total performance, but is a true analysis in the sense that sets of scores, each of which accounts for all the data of a particular type, are taken and used simultaneously when assessing the experimental results" (author's italics). No doubt the author was so familiar with his material that this sentence appears to him lucid in the extreme, but this has not proved the case with the reviewer and others. This leads on to one general criticism of an otherwise valuable little book: when the subject matter is by its nature complex, even the exclusion of all mathematical statistics to an appendix and a prolific use of line diagrams does not justify such wishful thinking as that the book as a whole will be readable for labour managers and industrialists. Most of the experimental results, forming half the text, demand sustained interest and considerable concentration. Once again we are presented with a reminder that technical data of a specialist nature and conclusions therefrom which can be stated in everyday language, simply do not mix to form a smooth text for a heterogeneous public. This warning should not, however, be permitted to excuse those concerned with the industrial implications of ageing from the worthwhile task of studying this report.

ALASTAIR HERON


The high frequency in the incidence of peptic ulcer justifies this investigation. An estimate in 1945, on the basis of hospital experience and national death rates, gave a figure of 1,500,000 people suffering from the disease, so it is clearly extremely important to learn as much as possible about the various factors in its aetiology.

The occupations investigated were those thought to have a particularly high or low incidence of ulcer. The former category includes lorry drivers, bus-drivers and conductors, and doctors; the latter includes clerks, labourers, and agricultural workers. A list of employees was obtained from each management, and the work of interviewing was divided into two stages. A preliminary interview was carried out by the social worker, who recorded particulars, such as sex, age, occupation, type of shift and hours of work per week, together with short clinical notes. These clinical notes enabled the medical worker to classify the cases into three categories: "no dyspepsia", "minor dyspepsia", and "major dyspepsia". Of all the cases classified as "major dyspepsia", a clinical diagnosis was made by the medical worker, and according to the results, the cases were then divided into the following groups: proved peptic
ulcer; presumptive peptic ulcer; other dyspepsia; and no dyspepsia.

On this basis, the distribution of peptic ulcer in the sample of the investigation was obtained for the various occupations. The incidence of peptic ulcer for men was 6.5%, for women 1.7%.

It is impossible in a brief review to give details of all the results reached by the investigators, and we turn our attention, therefore, to the main problem of the report, that is, to the occupational factors in the aetiology of peptic ulcer. For the study of occupational differences, men were classified into 20 groups. Taking the over-all incidence of ulcer in the entire survey as a standard of comparison, the incidence in a given occupational group was compared with it. A high incidence was found among doctors, among a group of unskilled workers, and also among foremen and business executives. There was a low incidence among agricultural, and possibly among sedentary workers.

The authors were very careful in assessing the value of such significant differences, and not to ascribe them without further consideration of the occupational factors. Thus, the high incidence among doctors in the sample is explained by more refined standards of diagnosis, and in the case of unskilled workers, by ulcer subjects seeking sheltered occupations.

As in every statistical investigation based on a sample only, we must decide the extent to which the generalization of the results is permissible. In order to decide questions of this kind, the type of errors involved in the method of sampling should be understood. The authors of the report list the following four errors which may have affected the results: a lack of cooperation from the population surveyed; a failure to interview the whole sample; a false diagnosis at the medical workers' interview; and a false diagnosis at the medical interview.

Discussing these errors, the authors conclude that none of them is likely to have biased the results, and the reviewer's definite agreement with this conclusion is based on the figures provided by the report in this connexion.

There remains, however, as the main source of error, the fact that the sample of the population surveyed is not a random sample. This error, too, has been duly taken into account by the investigators, who repeatedly emphasize the shortcomings of the sample in this respect. They state that the sample was not representative of the general population with regard to age, sex, geographical location or occupation, and that these factors may have an influence on the incidence. The population was reasonably represented in the sample only in its social class composition, although the various occupations within these social classes were not so well represented.

In spite of the uncertainty resulting from these various errors, the authors arrived at certain general conclusions. This means, they saw fit to generalize certain sample results, and to apply them to the population as a whole. Thus they conclude that the important factors in the aetiology of gastric and of duodenal ulcers differ. Duodenal ulcers occur mainly between the ages of 20 and 64; the incidence is greater in men holding responsible positions; and anxiety about work appears unduly common in duodenal ulcer subjects. In contrast, gastric ulcers are uncommon before the age of 35; they seem less closely related to the type of work, than to social class, for they are least frequent in the two wealthiest classes and most frequent in the poorest class. As to the general incidence, the report arrives at an estimate of 1,449,000 people suffering from peptic ulcer in England and Wales. This figure agrees with the estimate previously mentioned.

The results may, to the medical man, seem rather vague and unsatisfactory. He will tend to disparage them, if he is used to applying methods of the natural sciences, such as classification and experiment, which are designed to discover definite cause and effect relations, and differ from the statistical methods of social medicine. But a study of this type points out how medicine, as a natural science, can explore these problems further.

In view of the fact that generalization is the essence of scientific investigation, the authors of the report are quite justified in attempting such generalizations, even if these are based on their sample, which is, strictly speaking, non-representative. If work has been undertaken on a large scale in a report of this type, and the author, aware that the sample is not a random sample, refrains from all generalization, the whole undertaking would seem a great waste of effort. It is understandable that an author should hesitate to discard an investigation based on an apparently insufficient sample, or to expose himself to criticism, but the now fashionable escape from the difficulty cannot be recommended, for those who chose this way of escape frankly admit the insufficiency of the sample, and draw up a sort of legal document in which every conclusion is hedged in by qualifications in order to prevent any generalization of the sample results; this attitude implies a mistaken conception of the purpose of scientific effort, the essence of which should always be generalization. What matters, after all, is not whether the author, like Caesar's wife, is beyond suspicion of drawing conclusions too hastily, but whether he has added anything to our knowledge of the phenomenon in question with any reasonable degree of certainty.

G. H. Herdan