

of information and a worthy addition to the literature of organic chemistry. It will also be of interest to some students specializing in organic chemistry, as well as to chemists and technologists concerned particularly with synthetic dyes. The overall production is excellent, and the diagrams and formulae are clear and easy to follow. This book was compiled to commemorate the contribution to organic chemistry of Prof. K. Venkataraman on the occasion of his sixtieth birthday.

R. LIVINGSTONE

HISTORY OF THE INTELLIGENCE TEST

Studies in Individual Differences

The Search for Intelligence. Edited by James J. Jenkins and Donald G. Patterson. (The Century Psychology Series). Pp. xiv + 774. (London: Methuen and Co. Ltd., 1961.) 63s.

THIS volume brings together for the first time sixty-six previously published papers, covering the historical development of intelligence testing. The authors range from Sir Francis Galton (1869) to Dr. Guilford (1959). In terms of its professed aims—that of helping students—the collection must be judged a success; nowhere else can so many formative contributions be read with such ease.

Nevertheless, it is a sobering moment when a research field commemorates its ancestors in this way, and one which invites more general comment. First impressions are undoubtedly favourable. Almost all these articles reflect a high level of technical competence; and some of them, Spearman's for example, are works of virtuosity. Second impressions are less comforting. We are reminded of how long ago our present methods of testing were established, and how little we have added during the past forty years to our knowledge of their practical value. By the end of the First World War, intelligence tests were already established as valid instruments of general classification. Fryer (1922) shows, for example, that there is relatively little overlap in intelligence quotient between "dentists" and "labourers", between "clergymen" and "sheet metal workers". Since 1922, the mental testing movement has expanded out of all recognition, and there has been a luxuriant growth of theories about the structure of the intellect, but our tests and our knowledge of their predictive efficiency are in most essentials the same as they were when Fryer's article was written. By normal technological standards then, this is an area of conservatism, even of stagnation.

Another disconcerting impression is one of dullness. Thinking is presumably the human being's most interesting accomplishment, so it must be of some significance that, in our efforts to measure it, we have generated a literature of such tedium. Throughout its considerable length, this volume contains barely a handful of references to individual people tested—although Terman's work is an important exception in this respect—and even fewer instances of their thinking in real life situations. Indeed, in some of the more recent articles, scarcely a shred of human subject-matter remains. In view of the statistical sophistication that mental testers nowadays take for granted, this suggests not merely a neglect of natural observation but an actual flight from it. Paradoxically, it seems, the study of human thinking has become a haven for the kind of scientist who finds it natural to have as little personal contact with the people he tests as possible. The dangers of such a situation are obvious. Individuals, particularly those who are exceptions to a given rule, are invaluable to psychologists as a source of criticism. Their loss of interest in individual people may thus account not only for the dullness of the intelligence tester's work but also its conservatism.

Surprisingly early on, intelligence testers seemed to lose the inventiveness which characterized early pioneers like Binet. Covertly, they seemed to assume that all the essentials of intelligence could be measured with the tests to hand. Yet the briefest glance at the intelligence quotients of any group of successful brain-workers—research physicists for example—would have shown them that this was false. Many brilliantly successful men and women have relatively unimpressive intelligence quotients; many who succeed brilliantly at intelligence tests are relatively unimpressive in every other respect. It follows, at the higher levels at least, that the measurement of intelligence is an area crying out for innovation.

LIAM HUDSON

CIRCUMPOLAR PLANTS

The Circumpolar Plants

1. Vascular Cryptogams, Conifers, Monocotyledons. By Eric Hultén (Kungl. Svenska Vetenskapsakademiens Handlingar, Bd. 8, No. 5). Pp. 275. (Stockholm: Almqvist and Wiksell, 1962). 65 kronor.

PROF. HULTÉN is well known to everyone interested in phytogeography for the excellent distribution maps he has published of the plants of north-west Europe and, more recently, for his work on amphi-atlantic plants. In all these maps a great deal of information is conveyed with remarkable clarity by means of a combination of shading, individual symbols and lines.

The present volume is in a sense a continuation of the one dealing with the amphi-atlantic plants and follows the same general plan; in fact, as Prof. Hultén himself observes, no clear distinction can be drawn between the amphi-atlantic and circumpolar types of distribution.

The species included range from those, such as *Colpodium vahliianum*, which are nearly confined to the arctic, to others, for example *Adiantum capillus-veneris*, which reach their northern limit in England. They all have wide, though often strongly disjunct, distributions in the northern hemisphere.

In general, a broad view is taken of what constitutes a species and not infrequently the areas of groups of closely similar species are shown on one map. This practice has the advantage of bringing out certain features of circumpolar distribution, some of the most striking of which are discussed in the introduction. The discontinuities, it is suggested, are partly due to climatic preferences and partly to historical factors, such as the former existence of a large ice-dammed fresh-water lake in the Obi Basin. The not infrequent occurrence of a fairly uniform series of populations in the north paralleled by a ring of distinct subspecies or closely related species on mountains much further south is very plausibly explained in terms of climatic changes during the Quaternary period.

It is evident that over large areas information about the flora is inadequate so that both distributional data and taxonomy are unsatisfactory. This is a limitation which has to be accepted for the present, and it is to be expected that these maps will provide a stimulus for further work.

There are inevitably errors and omissions in a work of this size, even in regions the flora of which is as well known as that of the British Isles. Perhaps the most striking of these is in the map of *Potamogeton natans*, where only four localities, all in the extreme north, are shown though the plant is, in fact, recorded from every part of the country. Two other less obvious but perhaps more serious errors are the inclusion of records for *Eriophorum alpinum* and *Carex bicolor* from Scotland, neither of which is now accepted as correct.

These are, however, minor blemishes in a valuable and well-produced work, which would be more convenient to use if the pages had been cut by machine.

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