structures, is his best so far. It is not too hard to read. Though he as well as others will certainly follow it with further work, yet he has broken the back of the subject's principal difficulties. These, above all in classification and terminology, were formidable in a manner made peculiarly acute by the history of this study among the French, which he traces in a sympathetic chapter. The core of the work then comes in the 150 pages describing the tombs themselves, using, from the multitude of some 6,000 recorded, the numbers intelligible to-day in each of seven main regions: the North, Brittany, the Centre-West, the South-West, the South, the Centre, and the East. To visit these or their remains, perhaps 1,500 of them, the Daniels have travelled, tramped, recorded and tramped again, cheerfully making friends by friendliness and amassing information; the mass is here given to us critically sifted and classified, and steadfast readers will find that it makes sense. The steadfastness is of course put to some strains, though the worst is not the terminology, because Dr. Daniel has worked so hard to straighten the tangle of both French and English theoretical and descriptive terms. The most unnecessary is his assumption that readers can do without any sketch of the background in Mediterranean and Iberian lands whence French tomb-building was initially inspired. For of his two main categories, passage-graves come all from Iberia, whether Atlantic-wise to Brittany or Mediterranean-wise to the South, while gallery-graves may now be Iberian too, now adapted in the South from rock-tombs in Sardinia. One is supposed to have looked up classes of pottery, too, such as Bell-beaker or Polada, elsewhere beforehand.

The same applies to the chronology. For nearly all the dates used are borrowed, without reason for them given, from other lands. In the second millennium, most are slightly too low; in the third, the whole scheme may need drastic raising to meet carbon-14 determinations, which began to invade the megalithic field just when the book was finished. Yet this again means that it is timely: it tells us *what* the pattern is that carbon-14 may alter; and without that, the new method would have looked like making confusion worse confounded. The book deserves a serious welcome.

C. F. C. HAWKES

MATHEMATICAL DELIGHT

The Language of Mathematics

By Dr. Frank Land. Pp. vii + 264. (London: John Murray (Publishers), Ltd., 1960.) 21s. net.

IN an essay which formed part of the symposium "The Quality of Education", Dr. J. Bronowski put forward in 1947 the thesis that mathematics was a language. For many people this statement would seem to be an exaggeration if their remembrance of the subject was little more than a series of tricks designed to get the 'right answer' by the application of routine processes. Yet a little reflexion will show clearly that some, at least, of the essential constituents of a language are certainly present. There is a vocabulary (which like most may be merely remembered); there is certainly a grammar, the rules of which must be rigidly followed. It is a necessary means of communication about the real world, and here the limits need not be set within national boundaries. What has been so long neglected is the aesthetic appeal of this discipline, rigid in its logic but thrilling

in the power of its 'literature' and its 'poetry'. The past thirty years has been a time of amazing development at the frontiers of knowledge in this field, but there has also been astonishing progress in the methods of teaching at all stages from the primary school onwards.

Dr. F. W. Land, the professor-elect in education at the University of Hull, carried out an investigation into the "attitude and attainments of 2,000 grammar school leavers", and the study revealed the need to present the fundamental principles of mathematics in a new light for the mature reader. The Shell International Petroleum Co. made it possible for Dr. Land to embark on this project, and the present volume is his very successful attempt to satisfy this need. The book is published in two bindings, and there is now available a set of exercises which will add to the profit of those who approach it with serious intentions.

It is in every respect a delightful book; merely to turn its pages is an attractive occupation and the reader is drawn again and again to browse, to ponder and then to read with understanding. Little in the way of prior knowledge or acquired ability in mathematics is necessary from those who begin. If they are prepared to think as they read, the author's enthusiasm and clarity of expression, supported by Margaret Clark's beautiful illustrations, will carry them along. I read it at a single sitting and have no hesitation in saying that it should form part of the general studies course in every sixth form, as well as being a source of pleasure and profit to every intelligent adult.

The first six chapters are devoted to arithmetic, but they range far outside the limits of commercial calculations, which is all that so many students know about the concept of number. There is an attractive treatment of the problems of the calendar, and a careful discussion of the British system of units. Then come four chapters concerned with the generalizations which we know as algebra, though here again the range is wide and the treatment exciting; the use of graphs leads to such unexpected considerations as the whirls on the shell of *Nautilus* and the florets in the heads of *Compositae*. The second fundamental concept of mathematical thought, the concept of space, includes within its two chapters much that is traditional in geometrical teaching, but map projections and the four-colour problem, some elementary topology and the applications of Euclid's golden section, show how Nature has her laws which man may understand and use though he cannot control them. The final chapter, on statistics, is perhaps the only part of the book in which considerable demands are made on the reader, for though the treatment of normal distribution is easy and interesting, the development of correlation and the use of scatter diagrams may cause some readers to put aside the last few pages for 'another day'.

A tribute is due to Will Carter, who designed the volume; his collaboration with the printers has produced a book of lasting value and immediate appeal. The proof reading was carefully done for there are few misprints. Such blemishes as the statement (p. 171) that the three angles of a triangle "add up to a straight line", and the drawings (p. 156), which are neither isometric nor perspective, can easily be removed with a second edition, and this should soon be needed. The book ought to be in every public library in the country—or rather its place on the shelves should permanently be empty.

W. J. LANGFORD