surface soil, whereas deep penetration is achieved under other conditions.

An outstanding feature of these investigations is the care and accuracy with which the illustrations have been prepared. Photographs and ordinary sketches proved unsatisfactory in field work, and a method has been evolved whereby each root, as it is traced, is mapped into position on a vertical scale, horizontal maps also being made for certain plants, such as pumpkins, maize or cacti, in which the roots spread widely. A description is given of the method of excavation which has proved so remarkably successful on the type of soil dealt with, and a good bibliography rounds off a volume which fills a definite gap in the annals of agricultural botany and suggests many starting-points for further investigations. W. E. B.

Our Bookshelf.

Animals of Land and Sea. By Austin H. Clark. (Library of Modern Sciences.) Pp. xxxiv+276. (New York: D. Van Nostrand Co.; London: Chapman and Hall, Ltd., 1925.) 15*s.* net.

THIS is a good book, but misses being a very good book. It is full of interesting facts, but they are not always well arranged. Mr. Clark's knowledge is extensive and often peculiar, but he has not digested it well: too many of the chapters read like the outpourings of a notebook, not free from unnecessary repetition. Finally, the numerous figures are so dispersed through the book that they can scarcely be said to illustrate the text: thus, opening at random, one finds thirty-four drawings of "biting and parasitic flies, and some maggots and pupae of flies" facing a page that deals with flying-fish. Biting flies were discussed some hundred pages earlier, but there was in the text no reference to these figures; for any further explanation of them one must hark back to the list of text-figures. Possibly the publishers are responsible for this lack of co-operation, for it is a too common fault in popular books written to order. None the less, the authors are to blame, and it is surprising to find a man of Mr. Clark's vigorous personality permitting this indignity.

Towards the end of the book the method improves. The chapter on animal flight is on the whole excellent: it works out certain ideas and subordinates the facts and observations—many of them original—to the main arguments. Yet even here some of the cargo might have been jettisoned with advantage. The chapters on "The Basis of Life in the Sea," "The Intermediate Foods of the Sea," and "The Ocean and the Land"—a contrast between their inhabitants—also puts the facts in a novel light that may reveal points of interest even to those who know them already, and may suggest fresh lines of inquiry. We are acquainted, in a sort of a way, with hundreds of facts that we do not realise; we must fit them into a scheme and see their mutual relations before our acquaintanceship matures into knowledge. It is because Mr. Clark has acted increasingly on this principle that his later chapters are more effective than his earlier. The penultimate chapter—"Life's Borderlands"—which brings together the extremes of temperature, pressure, and the like, under which life can exist, is remarkably interesting.

To write a book of this kind in such a way as to attract a large public is no easy task. The entire and not wholly inexplicable ignorance that most otherwise well-educated people display regarding their fellow-creatures, especially the inhabitants of the waters, presents an almost insuperable obstacle to the writer or speaker who wishes to interest the ordinary man in these aspects of life. We hope Mr. Clark will be found to have succeeded, for his aim, prudently kept in the background, is one with which readers of NATURE will sympathise.

Le Relief de la terre: ses origines, ses lois, son évolution; principes nouveaux de géographie physique. Par Paul Soulier. Pp. x+432+3 planches. (Paris: Félix Alcan, 1925.) 30 francs.

THIS interesting, if not very convincing book may be described as a fugue with the hypsographic curve as its principal theme; a hypothetical structural curve derived from it as the answering subject; the geochemical cycle of water, often repeated, as the counter subject; and a final *stretto* in which these and many related episodes are worked up into an all-embracing explanation of terrestrial relief. The author supposes the effects of denudation and deposition never to have taken place, and shows that the hypsographic curve is then transformed into a simple structural curve. He deduces from this that the structural relief of the earth's surface follows the statistical laws of chance, and therefore, ignoring the implications of isostasy, he rejects Wegener's well-known deduction from the hypsographic curve. Erosion has accentuated the upper concavity of the 'original' curve, and the continental plains and shelves have developed on the middle regions of the structural surface by the accumulation of sediments.

A summary of various theories of mountain building is given and all the existing hypotheses are rejected as inadequate. The author then suggests that water passes down through the surface rocks to an underlying "active orogenic zone," where it promotes aquo-igneous fusion and a general expansion of the materials there present by a process of hydration. The activities of the orogenic zone are made responsible for all the puzzling phenomena of vulcanism, compression, and tension, and for the surface relief of the moon and of Mars as well as of that of the earth. The gradual lowering of the surface of the oceans, due partly to the intensification of relief and partly to the internal absorption of water, leads to the conception of islands developing into continents by coalescence and the uplifting of peripheral mountain systems.

M. Soulier's theory of the earth is not likely to win acceptance, for it runs counter to the modern trend of geophysics. In particular it ignores the effects of radioactivity, and introduces instead a hydrothermal process that seems quite incompetent to produce the results ascribed to it. Nevertheless, the book is original in method and stimulating in thought, and it certainly deserves to be read by those interested in the evolution of the earth's surface features.