it is rigid; there is no proof that it is crystalline below the crust. Isostasy is well treated, but recent work on near earthquakes and the crustal layers is not given. An up-to-date account of the structure of the Alps now appears. It is admitted that the cause of compressive deformation of the crust is one of the great mysteries of geology, and that it can at present be discussed only in a speculative way.

Many new illustrations have been added to the new edition, including admirable aeroplane photographs and block diagrams. Altogether the book is a well-balanced and effective presentation of a subject that is unusually difficult to deal with in an elementary way. Prof. Longwell and his collaborators have preserved the conservative spirit of the original text, clearly distinguishing between facts of observation and hypotheses of interpretation. The new edition should prove even more successful than the 1919 revision.

Structure and Surface: a Book of Field Geology. By C. Barrington Brown and F. Debenham. Pp. vii + 168. (London: Edward Arnold and Co., 1929.) 10*s*. 6*d*. net.

THIS admirable book has developed from an intention on the part of one of the authors to illustrate each of the simpler geological structures by an ideal block diagram and also by an actual example from an appropriate tract of the earth's surface. This enterprise has now been amplified by a text in which the structures and their recognition in the field are clearly discussed with special reference to the resulting land forms. The very numerous block diagrams, representing geological structures in three dimensions, are extremely effective, and give interest and vigour to a subject of which the treatment has often been woefully dull. To students of geology the book presents in a most attractive form the means of deducing from field observations many of the leading principles of structural geology and geomorphology, while for geography students it provides a sound basis for understanding intelligently the connexion between land forms and the rocks and structures out of which the surface relief has been carved. Two chapters are devoted to the construction of block diagrams, and notes on equipment and surveying instruments and field problems are added in three appendices. The book is one for which both students and teachers may well be grateful. Its production has clearly been a labour of love.

Mathematics.

Leçons sur quelques problèmes aux limites de la théorie des équations différentielles. Par Émile Picard. Rédigées par Marcel Brelot. (Cahiers scientifiques, Fascicule 5.) Pp. viii + 271. (Paris: Gauthier-Villars et Cie, 1930.) 60 francs.

IN continuation of Prof. Picard's course at the Sorbonne, this work is the third volume published in the 'Cahiers scientifiques' series. As would be expected from so distinguished an author, the book is a distinct mathematical contribution to both pure analysis and physics. The text is, for convenience, divided into two sections. The first, consisting of seven chapters, deals with ordinary differential equations which take their origin in mathematical physics. These equations in effect reduce to a study of the troublesome second order equation, and the author develops rigorously from both geometrical and analytical methods the powerful method of successive approximation. This involves an analytical consideration of the properties of certain functions, the conditions under which such functions exist in uniformly convergent series, and finally the theorem of Schmidt. The way is thus prepared for some important applications to the main problems of mathematical physics—the propagation of heat along a bar, vibrating strings, and the well-known problem of Fourier ("Œuvres", vol. 1, p. 85). The remaining chapters of Part I. are devoted to periodic integrals and infinite systems of linear algebraic equations which arise therefrom.

Part II. (Chaps. viii.-xii.) is concerned with partial differential equations. A consideration of harmonic functions, Dirichlet's problem, and the formulæ of Green and Poisson leads to a skilful extension of the contour method to that of a bounded surface. This yields greater generality in dealing with certain types of classical problems. Some instructive applications on the flow of heat in two dimensions and radiation in space are given. Finally, the equation of Fredholm and the potential functions of Laplace are studied together with some valuable deductions in analysis and physics.

The whole volume is most interesting and stimulating; it is undoubtedly a substantial contribution to the accessible literature on the theory of differential equations and their application.

The Theory of Approximation. By Prof. Dunham Jackson. (American Mathematical Society Colloquium Publications, Vol. 11.) Pp. viii + 178. (New York: American Mathematical Society, 1930.)

As the author of this work points out in his preface, "it is a brief essay in a field on which an encyclopædia might be written", namely, an investigation of the degree of approximation with which a continuous function can be represented by a polynomial of given degree.

Starting from the well-known theorems of Weierstrass on the approximate representation of a continuous function either by a polynomial or by a trigonometric sum, Prof. Jackson proceeds to prove other theorems on approximation by trigonometric sums, and then to examine the convergence of Fourier and Legendre series under the hypotheses of continuity over part of an interval, and of limited variation. Some generalisations of the principle of least squares are next discussed, and a very useful chapter follows on trigonometric interpolation in which some striking analogies between the theory of interpolation by means of trigonometric sums and by Fourier series are revealed. The interpolation formula analogous to the Féjer mean is especially interesting. In the final chapter is a very instructive introduction to the geometry of function space.

The book is excellently printed, and a welcome,