All these points and others are dealt with in the work under notice ; in fact the scope of the book is scarcely described by the title, for although a good many pages deal with the cultivation of Citrus fruits in a concise and altogether excellent manner, historical, botanical, and marketing problems are dealt with quite as succinctly.

Although the author only sets out to describe the position that Citrus fruits hold in the United States of America, he gives a fund of information that will be found to be of value to growers in other parts of the world. Commencing with a chapter on the " Commercial Importance of Citrus Fruits," the author indicates by tables the growth of the industry in Florida and California from the years 1886–87 to 1923–24 inclusive. His records are taken from the number of boxes of fruit handled by the railway companies during that period, and it is illuminating to learn that whereas in 1886–87 1,260,000 boxes were despatched from Florida and 840,560 from California, in 1923–24 Florida sent away 20,399,614 boxes and California 24,292,800 boxes. In the chapter dealing with the botany of the Citrus fruits, the author gives descriptions not only of the species bearing marketable fruit but also of allied species and the few interesting hybrids that have been raised. He takes a limited view of both genera and species. The trifoliate-leaved section, for example, that is so well represented by *Citrus trifoliata* Linn., he places under the generic name of Poncirus, whereas the Kumquat group appears under Fortunella. He also limits the range of the species retained in Citrus. Thus the lemon appears as *C. medica* Linn., the lime as *C. aurantifolia* Swingle, the shaddock as *C. maxima* Merrill, the pomelo or grapefruit as *C. paradisi* Macf., the sour or Seville orange as *C. Aurantium* Linn., and the sweet orange as *C. sinensis* Osbeck. The cultivated groups of Citrus fruits are then divided up and the varieties cultivated in America are dealt with. Some 49 varieties of sweet orange are described under the sub-heads Spanish oranges, Mediterranean oranges, blood oranges, naval oranges. Sixteen varieties of pomelo or grape-fruit are described, with numerous limes and lemons.

The cultural part of the book deals with all operations from propagation and planting to the care of the mature trees. Manuring, treatment of diseases, pruning, collecting the crop, and many other aspects are discussed. Handling the crop and marketing is also a very useful section. The author is to be congratulated upon the production of a very complete and useful book.   W. D.

The Calculus of Variations.

Calculus of Variations. By Dr. A. R. Forsyth. Pp. xxii + 656. (Cambridge : At the University Press, 1927.) 50s. net.

PROF. FORSYTH'S latest work appears opportunely at a time when there is quite a notable revival of interest in the calculus of variations. To those who desire an account of the subject which, while modern, sound, and practical, is free from the extreme rigour so popular in certain quarters, this volume will be most welcome.

The first chapter contains a discussion of the early investigations associated with the names of Euler, Legendre, and Jacobi. Here the discarding of the irritating δ-notation originally introduced by Lagrange has greatly clarified the exposition. In the second chapter an account is given of Weierstrass's modifications of the analysis when both the independent and the dependent variable are subjected to variations. The four following chapters deal with extensions to the cases in which the integrals involve derivatives of higher order than the first and more than one dependent variable.

Up to this point the variations considered are of such a nature that one smooth ' characteristic ' curve is deformed into a neighbouring smooth curve. Such variations are described as ' weak ' variations. In order to obtain complete solutions of the problems of the calculus of variations, it is necessary to consider the possibility of small ' jagged ' or ' strong ' variations. The discussion of such variations has shown that, while the tests employed in the older analysis are necessary, they are by no means sufficient ; and, indeed, it has been found that some of the most important results believed to have been established by the older methods are no longer valid. Weierstrass investigated one simple type of these ' strong ' variations, and an account of his work, and of his E-function, is given in chapter vii.

The eighth chapter deals with relative maxima and minima of single integrals, and the remaining four chapters contain extensions to double and triple integrals, the analysis in these naturally becoming more complicated. Throughout the book there are numerous examples fully worked out.

Though the calculus of variations has been studied spasmodically for some two hundred years, its development has scarcely yet reached a stage at which it would be possible to write a compact account of the subject suitable for use as a college text-book ; but, to original workers, this treatise should prove both useful and stimulating.