A SHORT TREATISE ON THE PRINCIPLES OF THE DIFFERENTIAL AND INTEGRAL CALCULUS

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A Short Treatise on the Principles of the Differential and Integral Calculus by Baden Powell

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BADEN POWELL

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DESIGNED FOR

THE USE OF STUDENTS IN THE UNIVERSITY.

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MDCCCXXIX.

PREFACE.

SINCE the period at which the study of the Differential Calculus in its modern form has been cultivated in England, so numerous have been the treatises designed for the purposes of instruction in that calculus, that the appearance of a new work on the subject may be thought to need explanation.

The following short treatise, then, has been compiled with a special reference to the circumstances under which mathematical studies are at present prosecuted in Oxford. And it is hoped that the academical student will find it better adapted to his immediate wants and objects than the existing larger treatises, which, though most valuable sources of information on the higher parts of the calculus, and of illustration for all parts of it, are neither always sufficiently satisfactory in their exposition of the first principles, nor in their general design altogether well adapted to the purposes of elementary instruction.

In the present Compendium it has been the author's object to compress into the smallest compass, consistent with the full explanation of every process, an account of the *most essential principles* of the science. He has limited the extent of his selection to those parts which are at once of the most general and useful application, and of a nature suited to the earlier stages of a student's progress. In the Integral Calculus especially, he has carried the investigation only so far as to convey a general notion of its nature, and to supply what is requisite for its application to those subjects which usually form a part of an elementary course.

Throughout the whole, the author's attention has been exclusively directed to the elucidation of the fundamental principles of the science, rather than to the details of its applications: since it appears to him that it is in the former particular that most of the existing treatises are deficient, while in the latter they are redundant.

For a supply of examples, illustrations, and applications, the student is therefore presumed

to have constantly at hand the valuable "Col-"lection of Examples on the Differential Cal-"culus," by Mr. Peacock; and for more general views of the science, and the discussion of its more abstruse departments, he is referred to the treatises of Lacroix, Boucharlat, Lardner, Jephson, and Hind, from which the fullest information may be derived. To these works particular references are given through all parts of the following Treatise.

For his materials the author makes no claim to originality, but acknowledges himself largely indebted to the treatises of Boucharlat and Lacroix. He is aware that the omission of examples may by many be regarded as a great defect. But should the present little work be favourably received, he hopes at a future period in some measure to remedy this defect by offering a collection of the applications of the calculus to the geometry of curves, with a view to the completion of his former introductory Treatise on the Elements of Curves.

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DIFFERENTIAL CALCULUS.

PART