

## P R E F A C E.

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THE course of algebra embodied in the present work is substantially that pursued by students in our best preparatory and scientific schools and colleges, with such extensions as seemed necessary to afford an improved basis for more advanced studies. For the convenience of teachers the work is divided into two parts, the first adapted to well-prepared beginners and comprising about what is commonly required for admission to college; and the second designed for the more advanced general student. As the work deviates in several points from the models most familiar to our teachers, a statement of the principles on which it is constructed may be deemed appropriate.

One well-known principle underlying the acquisition of knowledge is that an idea cannot be fully grasped by the youthful mind unless it is presented under a concrete form. Whenever possible an abstract idea must be embodied in some visible representation, and all general theorems must be presented in a variety of special forms in which they may be seen inductively. In accordance with this principle, numerical examples of nearly all algebraic operations and theorems have been presented. For the purpose of illustration, numbers have been preferred to literal symbols when they would serve the purpose equally well. The relations of positive and negative algebraic quantities have been represented by lines and directions from the beginning in order that the pupil might be able to give, not only a numerical, but a visible, meaning to all algebraic quantities. Should it appear to any one that we thus detract from the generality of algebraic quantities, it is sufficient to reply that the system is the same which mathematicians use to assist their conceptions of advanced algebra, and without which they would never have been able to grasp the complicated relations of imaginary quantities. Algebraic