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## PREFACE.

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THE present work is a complete revision of the "Manual of Determinative Mineralogy and Blowpipe Analysis" by Prof. Geo. J. Brush, which has been very generally used since its first appearance in 1874, as shown by the fact that fourteen editions of it have appeared. In 1896 a revision of the introductory chapters devoted to blowpipe analysis and the chemical reactions of the elements was published, and there are now added a chapter on the physical properties of minerals, devoted chiefly to crystallography, and a new set of analytical tables for the identification of minerals.

In preparing the introductory chapters, great pains has been taken in the selection of the tests for the elements. Many of the experiments are performed by means of the blowpipe, but chemical tests in the wet way are recommended when it is believed that they are more decisive. All the tests have been carefully verified, and many of them have been devised especially for the present work. To make the book more convenient for reference, conspicuous headlines and catch-words have been freely used. The tests for the rare elements, and those for the common ones which are only occasionally employed, are printed in small type. It is hoped that the plan adopted of giving full directions concerning the methods of manipulation and the quantities of materials to be taken in making many of the tests will be found useful.

It must be borne in mind constantly that accuracy is of the utmost importance in determinative mineralogy, and it is believed that no methods are so generally to be relied upon for giving decisive results as those based upon the identification of the chemical constituents of the minerals. Moreover, most minerals can be identified by means of very simple tests, although some cannot be determined beyond question without resorting to the more elab-