

and the climates of the earth's surface; V., the difficulties in the way of navigation due to storms, head winds, calms and fog; VI., the movements of the ocean, viz., waves and tides. Of these chapters the fifth seems to us perhaps the most generally useful in the book. It deals with the nature, seasons, tracks and characteristics of cyclones in the different oceans, and the rules for navigating when in the vicinity of a cyclone. The relation of the prevailing winds and calm belts to various sailing routes are clearly presented, and the prevalence of fog in different regions is briefly discussed.

In connection with the sailing directions, Köppen makes use of an ingenious device, modelled after Piddington's famous transparent storm cards in his classic 'Sailors' Horn Book for the Law of Storms.' Köppen's storm card consists of a transparent sheet of paper, on which are three figures. The first shows the winds around a cyclone in the Northern Hemisphere; the second shows the winds around an anticyclone in the Northern Hemisphere; and the third shows the characteristic isobaric types and accompanying wind changes during the easterly movement of ordinary weather conditions. By turning the transparent paper over, the same diagrams serve for the Southern Hemisphere.

Such a book as Köppen's *Grundlinien der Maritimen Meteorologie* should be translated into English, and it is to be hoped that the author will arrange to have an English edition published shortly.

R. DEC. WARD.

*Descriptive General Chemistry.* By S. E. TILLMAN, Professor in the U. S. Military Academy. New York, John Wiley & Sons. 1899. 2d Ed., p. 429.

This new aspirant for chemical honors has been written mainly for the use of the cadets of the U. S. Military Academy. In the language of the author "it has generally been the conclusion of those charged with this instruction at the Academy in the past that the laboratory method alone, or mainly, in so short a course, could not be made of as much value to the pupils as the method of making the *acquisition of knowledge* the essential feature, and that the best results could be reached through careful

study of the proper text, well-conducted recitations, accompanied by experimental and explanatory lectures." Accordingly "this book has been prepared to embody the substance and arrangement of a short chemical course for the *general* student. It aims to give a concise statement of the more fundamental principles of chemistry, together with that class of chemical information most essential to cultured men, and which will enable them to comprehend many ordinary natural phenomena, as well as to understand the more important applications of the science which are now so frequently met with. The book is not fitted nor intended for laboratory guidance."

It is an interesting production and merits high praise and a cordial reception from all interested in the promulgation of chemical science.

EDGAR F. SMITH.

*Elementary Studies in Chemistry.* By JOSEPH TORREY, JR., Harvard University. New York, Henry Holt & Co. 1899. Pp. 487.

Nearly every teacher of chemistry in time feels that even the best text-books which have been prepared are not just exactly what he desires. He is imbued with the idea that what he wishes the student to derive from a course of chemical instruction can be better obtained by some other method or plan than any previously proposed. In other words, he wishes to reach the goal in his own peculiar way. He knows what that goal represents, how he reached it, and is firmly convinced that by his method those placed in his charge can also gain it. The usual result of this reasoning is eventually a new book on chemistry. The author of the present volume, 'dedicated to my students, past and present,' has doubtless had his own experience in getting young men to profit by careful drill in chemical experimentation, etc., and in this new contribution outlines his method of instruction.

The reviewer has had great pleasure in following the different steps of the development, and is happy to add that in his humble judgment, Mr. Torrey has prepared a most valuable student guide, and deserves the congratulations of both students and teachers of the science.

EDGAR F. SMITH.