for use again in this manner, but the elastic properties of tubing ca not well be restored.—Ber. Chem. Ges. 2. In order to prevent India rubber materials from hardening and cracking, they are steeped in a bath of melted paraffin for a few seconds, or several minutes, in accordance with the size of the articles, and then dried in a room heated to about 212 deg. F.

(10503) C. N. asks how to bottle horseradish. A. Six tablespoonfuls scraped or grated horseradish, 1 tablespoonful white sugar, 1 quart vinegar. Scald the vinegar; pour boiling hot over the horseradish. Steep a week, strain, and bottle. Exposure to the air will discolor.

NEW BOOKS, ETC.

POCKETBOOK OF AERONAUTICS. By Major Hermann W. L. Moedebeck, in collaboration with O. Chanute and others. Translated by W. Mansergh Varley, B.A., D.Sc., Ph.D. London: Whittaker & Co., 1907. 14mo.; pp. 426; 140 diagrams and illustrations. Price, $3.25.

This book is a comprehensive *résumé* of the entire subject of aeronautics. It is written by a well-known German authority, and has been brought up to date by the various collaborators. The book contains sixteen chapters dealing with such subjects as physics of the atmosphere; meteorological observations in balloon ascents and the computation of results; the technology of gases; the theory, practice, and technique of ballooning, and ballooning from a military standpoint; kites and parachutes; animal flight; artificial flight; airships; flying machines; motors and air screws. All of these subjects are treated in detail. The section of the book dealing with balloons and ballooning is very complete, and includes a brief history of military ballooning in all the different countries. The question of firing projectiles at and from balloons and airships is also discussed, and there is an interesting chapter on balloon photography.

The section on artificial flight is divided into three parts. The first of these is historical, and the other two, by Otto Lilienthal and Octave Chanute, respectively, treat of this subject from a practical standpoint, and describe the various machines of different inventors with which experiments have been made, besides giving the theories of the action of the air upon plane and curved surfaces. The book contains reproductions of a number of excellent photographs of Lilienthal and the Wright brothers in gliding flight. A letter of the Wright brothers, written November 17, 1905, in which they detail their final successful flights with a motor-driven aeroplane, is reproduced. Chapters XIII. and XIV. on flying machines and on motors (by Major Hermann Hoernes) treat very elaborately of the laws of air resistance found by various experimenters, the fundamental laws of aerodynamics, aerodynamical calculations, etc.; and of all kinds of motors such as electric, steam, and gasoline, that come useful to the aeronaut. The Major also has a chapter on air screws, which will be found valuable. The book also contains a list of the different international aeronautical societies, of which there are over a score throughout the world. An Appendix gives many valuable tables and formulæ.

TUNNEL SHIELDS AND THE USE OF COMPRESSED AIR IN SUBAQUEOUS WORKS. By William Charles Copperthwaite, M.Inst. C.E. New York: D. Van Nostrand Company, 1906. 4to.; pp. 390; 260 illustrations and diagrams. Price, $9.

This is an elaborate treatise on the tunneling shield and its use in subaqueous work. The book has been compiled from papers printed in the Proceedings of the Institution of Civil Engineers, and from descriptions of tunneling work that have appeared in technical journals. The author is a man of considerable experience in this line of work. He discusses the shield from the date of its invention in 1818 up to the present time, and illustrates all of the various types that have been designed and put in operation. The book contains a chapter on the use of compressed air in engineering work, with some notes on caisson disease. Another chapter discusses the use of cast-iron lining in tunnels. The shield which was the invention of Mr. Alfred E. Beach, one of the original editors and proprietors of this journal, and with which he constructed a tunnel beneath Broadway in 1869 is illustrated and described. The Greathead shield, which was invented and used about the same time in England, is also discussed in Chapter IV. Other chapters are devoted to the use of the shield in water-bearing strata and the use of the shield in masonry tunnels. Chapter X describes the recent tunneling work carried out in England and in France by means of a shield, or with compressed air. The final chapter of the book is a practical one on the cost of construction and operating a shield. The book is completed by two Appendices giving a chronological list of events connected with tunneling by means of a shield or compressed air, and also giving English patents relating to this manner of tunneling from 1818 to 1904 inclusive. This book is especially recommended to engineers or others wishing to become familiar with this fascinating subject.

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