

## THE LIQUEFACTION OF HYDROGEN.

A note by Mr. M. W. Travers, as abstracted in the *Transactions* of the British Institution of Civil Engineers, gives an account of the method whereby the author has succeeded in obtaining liquid hydrogen in quantity. The apparatus consists essentially of a modified Hampson air-liquefier. The hydrogen, at a pressure of 200 atmospheres, undergoes a preliminary cooling  $-80^{\circ}$  C. in solid carbonic acid and alcohol. It is then successively cooled by liquid air boiling under atmospheric pressure, and under a pressure of 100 millimeters, after which it escapes from the Hampson valve, and being sufficiently imperfect gas at the low temperature ( $-200^{\circ}$  C.) obtained by the liquid air boiling under low pressure, regenerative cooling is produced, as in the liquefaction of air by the Hampson machine, and liquid hydrogen is obtained. It is collected in a vacuum vessel which is specially insulated from external heat.

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BOOK NOTICES.

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*Practical Electric Railway Handbook.* By Albert B. Herrick. Pocketbook form, pp. 407. New York: Street Railway Publishing Company. (Price, \$3.00.)

The author of this work is well known to the electric railway fraternity as an expert engineer of tests in electric railway operation. He has embodied in his work above entitled the leading facts and data bearing on the efficiency of electric railway operation and has endeavored to make the subject as free from mathematical abstrusities as possible. W.

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*Lessons in Practical Electricity.* By C. Walton Swoope. 8vo, pp. XIII + 413. New York: D. Van Nostrand Company, 1901. (Price, \$2.00.)

The work above entitled originated from the need felt by the students of the Spring Garden Institute, with which the author was associated for years as an instructor, for an elementary text-book elucidating the principles of the science, and illustrating its application in practice.

The original work entitled "Lessons in Practical Electricity," fulfilled its purpose so well that the present enlarged and thoroughly revised edition has been issued. W.

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*Electrical Catechism.* An introductory treatise on electricity and its uses. By Geo. D. Shepardson, M.E. Large 8vo, pp. 403. New York: American Electrician Company, 1901. (Price, \$2.00.)

The author has endeavored to present in this volume, in non-technical language, the information sought by electrical workmen, superintendents and others employed in electrical factories, the essential principles of the science. The work should prove of very decided benefit to the class of electrical operatives. W.