

TECHNICAL REVIEW.

The White Star Line is having Marconi wireless telegraph outfits installed in its vessels. The first one to be equipped is the Oceanic.

A German patent has been taken out for an electrical apparatus by which shoals of fish may be detected and their extent estimated. A microphone connected with an electric battery and telephone is lowered into the water. The constant tapping of the fins against the microphone produces sounds which immediately betray their presence.

The *Scientific American* of Jan. 14th contains an interesting article on a recent comparison made by the State Railroad of France between two French locomotives, one of which was of the celebrated De Glehn compound type, and two American locomotives, one of the simple type, the other, the Vaucrain. The coal consumption per horse power, contrary to the generally accepted opinion, is shown by these tests to be about the same for the American as for the French locomotives; the American compound burning 3.3 pounds of coal per horse power hour as compared with the consumption of 3.24 for the French De Glehn engine, and that of the American simple engine being about the same as that of the French simple engine, the respective figures being 4.45 and 4.4 per horse power hour. From further tests the French officials claim that the American locomotives exhibit a low boiler efficiency; that there was excessive priming; that the steam was not utilized so economically in the cylinders as in the French locomotives, and that in consequence of less careful construction, the internal resistance of the American locomotives was greater than that of the French type. Furthermore they claim that

while the American piston valves have certain advantages, they are difficult to keep tight, causing much loss by leakage. Again, the French single-expansion engine averaged 85 per cent. of the normal power, while the competing American single-expansion doing the same work developed only 63 per cent. of its normal power. It was, therefore, not working under such good economic conditions as its competitor. This is largely accounted for by the fact, that in American locomotives which are built for rougher work and heavier grades than the French, the steam is not cut off until the piston has traversed from 40 to 50 per cent of the cylinder length, whereas, in the French engines it occurs when about 25 per cent of the distance has been covered.

In accepting the results of these tests it must be considered that the American locomotives were handled by French engineers who were not so familiar with them, and perhaps not so capable of getting the very best results from them, as American engineers would have been.

The Use of Copper Sulphate in Purifying Water.

The fact that copper sulphate in water will kill certain germs has long been known, but the fear of its poisonous effects has prevented its coming into general use. Recent tests have indicated that one part of copper sulphate in eight million parts of water will kill all microscopic growths. After several days the copper is eliminated by precipitation but even before it falls there is no danger to human life or health, for a person using water so treated would have to drink forty gallons in a day to swallow a medicinal dose of the chemical. Thus it is seen that we have a compound, which, placed in the hands of one who understands its use, could be effectively used for purification of our lake water.—Case Tech.

Library Notes.

Books added to the Library, Jan. 16-23, 1905.

Airy, Osmund—Charles II. (New Ed.)

American book prices current.

Benjamin, L. N.—The St. Albans Raid.

Japan in the Beginning of the 20th Century.

Madison, James—Writings, v. 5. 1787-1790.

National Educational Association—Yearbook, 1904-5.

N. Y.—Merchants' Assoc.—Passenger Transportation Service in the City of N. Y.

Nicholson, J. P.—Pennsylvania at Gettysburg. Revised ed. 2 v.

Rhodes, J. F.—History of the U. S. from the Compromise of 1850. v. 5, 1864--66.

Scherger, G. L.—Evolution of Modern Library.

Tribune Almanac & Political Register, 1905.

Ward, H. A.—Catalogue of the Ward-Coonley Collection of Meteorites.

Warren, F. M.—Ten Frenchmen of the 19th Century.

Wilcox, D. F.—Municipal Government in Michigan & Ohio Chemistry Department.

Blyth, A. W. & M. W.—Foods: Their Composition & Analysis, Ed. 5.

Dennis & Whittelsey—Qualitative Analysis.

Lengfeld, Felix—Inorganic Chemical Preparations.

Vulpe, H. T.—Laboratory Manual of Inorganic Preparations. 3d ed.

Books added to the Library Jan. 9-16, 1905.

Daily Tribune Index for 1903

Kurtz, Fred. Sr.—Centennial history of Centre county, 1800-1900.

Miller, John—Metaphysics, 3rd ed.

Porto Rico—Register for 1903.

Theobald, F. V.—First report on economic Zoology. (British Mu-