In 1867 the British Government built the "Water Witch," a 1200 ton vessel, to test the value of hydraulic jet-propulsion. Engineering records show that several jet steamers have been built since that date; the latest being the "Duke of Northumberland," completed in 1890 for life-saving purposes.

It is now well known that theorists were wrong in their conceptions of the efficiency of a jet. The eminent authority, Mr. S. W. Barnaby, has shown that the efficiency of the jet is 75 per cent, as against 65 per cent for the screw: in other words, it is 15 per cent better than a remarkably efficient screw. Why, then, has not the jet entirely superseded the screw? Mr Barnaby has shown that it is due to pump inefficiency. This is a loss which may be reduced, but cannot be entirely avoided. Friction and inertia in the pump more than neutralize the enormous advantage possessed by the jet over the screw. The average pump loss is about one-half the total power.

Mr. R. H. Tucker of Boston, in 1880, tried direct-air propulsion on a canal-boat. An 8-horse-power engine drove a No. 4 Root blower, the air being discharged directly against the water astern. The Root blower has an efficiency of about 75 per cent. The result, four miles per hour, showed a good efficiency for the fuel expenditure.

As a whole, the Secor system provides those thermo-dynamic conditions which science demands, but which cannot be satisfied in a reciprocating, rotating heat-engine. In every known method of propulsion, whether paddle, screw, or jet, there is a considerable expenditure of power between the cylinder and the propeller. In the Secor system, friction and inertia of moving parts are eliminated, and, without anterior loss of heat or power, that method of propulsion is adopted which is suggested by the most advanced science.

The purpose of the present paper is to state briefly the theory of the system rather than to discuss its commercial or naval advantages. It may, however, be mentioned that a first-class transatlantic steamer carries a weight of 5,500 tons in engines, boilers, fuel, and water. To offset this permanent ballast, there is the passenger accommodation, and capacity for less than 1,000 tons of paying freight,—$10,000 in coal, about $600 in oil,—and 180 men are required to keep the leviathan in motion for one trip. In view of this situation, the advantages of the Secor system, in theory at least, are evident.

NOTES AND NEWS.

THE eighth congress of the American Ornithologists' Union will convene in Washington, D.C., on Tuesday, Nov. 18, at eleven o'clock A M. The meetings will be held at the United States National Museum. The presentation of ornithological papers will form a prominent feature of the meetings; and members are earnestly requested to contribute, and to notify the secretary in advance as to the titles of their communications, so that a programme for each day may be prepared. The address of the secretary is John H. Sage, Portland, Conn.

— Platinum has long been recognized as an extremely refractory metal to use in electroplating, the difficulties mainly arising from the fact that the strength of the bath cannot be maintained, as with other metals, by using a plate of platinum as the anode, as the metal will not dissolve. The consequence is, that both the richness and conductivity of the bath are continually altering, and a satisfactory deposit can only be obtained by the most constant attention. In a recent paper on the subject which was read before the chemical section of the Franklin Institute, according to *Engineering* of Oct. 10, Mr. William H. Wahl states that it occurred to him that it might be possible to maintain the strength of the bath by greatly increasing the surface of platinum at the anode, which was accomplished in the following way: a plate of carbon was saturated with platinic chloride and dried, thus impregnating the plate with the salt, from which the platinum was finally reduced to the metallic state by heating the whole plate in a crucible. In this way a deposit of platinum in an extremely fine state of division was obtained in the pores of the carbon plate, and this plate was then used as the anode of the electrolytic bath. On passing the current, the platinum proved to be readily soluble in a bath of hydrochloric acid, and so far the experiment was a success; but the process proved useless from a commercial point of view, as the metal still remained insoluble when the bath consisted of oxy salts of platinum, which alone give good deposits. It was therefore necessary to devise some other plan, and after many fruitless experiments Mr. Wahl claims to have succeeded by using platinum hydroxide for maintaining the strength of the metallic solution. For this purpose the salt, which is readily soluble in alkalies and in many of the acids, may be introduced into the plating bath from time to time, and dissolved therein by stirring; or it may be permitted to remain in the bath in excess, either at the bottom or suspended in a canvas bag adjacent to or surrounding the carbon anode. A weak aqueous solution of caustic soda or caustic potash, especially the latter, will dissolve a large quantity of platinum hydrate; and the solution has the advantage of being freely conductive of electricity, and of yielding bright, regular, and adherent deposits of platinum on electrolysis. Further, with currents of moderate strength, the platinum hydrate only is affected; and hence the constitution of the bath can be easily maintained constant by adding fresh supplies of platinic hydrate. Other solvents have also been tested by Mr. Wahl, but for these details we must refer our readers to his paper, contenting ourselves with giving the main outlines of his discovery.

—The United States Coast and Geodetic Survey Office has received from the Government Printing Office Appendices Nos. 12 and 13 to the "Report of the Superintendent for 1888," in pamphlet form. Their titles are "No. 12. Hypsometry: Heights from Geodetic Levelling between Arkansas City, on the Mississippi River, and Little Rock, Ark., 1887–88 (field-work by J. E. McGrath, sub-assistant; reduction by C. A. Schott, assistant);" "No. 13. Astronomy: Differential Method of computing Star Places," by E. D. Preston, assistant. The levelling-work in Arkansas was continued in 1889 by Sub-Assistant Isaac Winston, who ran the line from Little Rock, Ark., to Fort Smith, Ark. Mr. Winston will probably extend the same work during the coming season, beginning at Fort Smith, Ark., and running northward toward Kansas City, Mo., where eventually this line will be connected with the main transcontinental line of levels. The results that are now being obtained are immediately utilized by the Arkansas Geological Survey and others.

— A meeting of a committee of Harvard students has been held to consider the best means of raising a fund for building a new library reading-room. For several years students and instructors alike have felt the need of such a room, capable of being lighted and open in the evening. Two years ago a petition signed by nearly every student of the university was presented to the corporation, asking to have Gore Hall lighted by electricity. The corporation deemed this unsafe, since the present building is not fire proof; and impossible, since they had not the funds necessary to make it fire-proof. To a letter asking what the cost of such a reading room would be, the president replied, "A proper reading-room attached to the present library building would cost from $100,000 to $200,000, according to its size and general style. A plain stone building of sufficient size, made fire-proof and lighted with electricity, could hardly be built and furnished for less than $100,000. If the design were elaborate and handsome, as well as sufficiently spacious, it could not be built for that sum." Ill ventilation, bad light, and early closing of the library, together with the feeling that no remedy was forthcoming, brought the matter forcibly before the students. The committee above referred to considered the advisability of taking active steps in the matter, and voted to make a canvas of the college in order to raise as large a portion of the fund as possible among the students themselves, and then, by a circular letter, to appeal to the alumni for the rest. Accordingly the college has been canvassed; and, notwithstanding the many demands upon the students for money consequent upon the opening of a new college-year, 789 men have already contributed $3.530, or $4.40 per man. According to the last quinquennial catalogue, there are about 5,500 living graduates of the college proper. It is to be hoped that from so large a number at least $150,000 will be speedily forthcoming.