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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are sharp, the articles short, and the facts authentic, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

THE BROOKLYN RAPID TRANSIT EXTENSION.

The citizens of New York will approve the stand taken by President Orr, of the Rapid Transit Commission, in regard to the proposal, more ambitious than tangible, of Mr. Johnson to build an extension of the subway system through South Brooklyn to Fort Hamilton, and across Staten Island to a junction with his proposed Philadelphia and New York trolley line. Mr. Johnson may be perfectly sincere in his intentions, and, for all we know, may have the necessary ability and capital to do everything that he promises; but he has certainly failed, thus far, to place his proposal before the Rapid Transit Commission in such a practical form as would justify that body in taking it into serious consideration.

In a communication to the Railroad Committee of the Municipal Council, and the Chairman of the Committee on Streets and Highways of the Board of Aldermen, President Orr says that the difficulties in the way of laying out and offering at public letting any such road as Mr. Johnson describes, are two: First, that at the present time the city cannot afford to borrow for rapid transit purposes more than \$8,000,000, which sum the Rapid Transit Board is advised by its engineers will probably suffice to extend the railway beneath the East River to the Borough Hall and Flatbush Avenue. Such a road as Mr. Johnson describes would probably cost in the neighborhood of \$24,000,000, and in view of the possible difficulties in tunneling beneath the Narrows, might cost a great deal more. President Orr points out, secondly, the uncertainty as to securing a bidder, since Mr. Johnson does not positively say that he will bid for or build a road on the lines he suggests. With regard to Mr. Johnson's statement that he is able and willing to carry passengers for three-cent fares within the city limits, Mr. Orr's letter pertinently suggests that if the Municipal Assembly will approve the plans of the Rapid Transit Commission, and the contract is put up for public letting, Mr. Johnson may bid, and include in his proposal the offer for a three-cent fare, that being the proper time and the proper way to have such an offer considered.

In its treatment of this latest proposition, the Rapid Transit Commission has shown the discretion which has been a marked feature in its very successful handling of the great problem before it. With over twenty miles of tunnel road under contract, and a proposed extension to cost \$8,000,000, we think that the only possible course for the Commission is the rejection of a scheme so extravagant and immature as this Staten Island proposal. Some day in the future, the Rapid Transit system will be extended through South Brooklyn and beneath the Narrows to reach the large suburban population on Staten Island; but the time is not yet come.

A STEP BACKWARD.

When the last Congress adjourned without making any provision for new battleships and cruisers—the first time such an omission has been made in ten years—the United States Navy was set back among the growing navies of the world by just twelve months in time, and by exactly the number of battleships and cruisers which represents the average annual addition, that should be made at this time to our navy, if we are to maintain even our present relative standing among the world's powers.

It is at all times the risk and, as the last Congress has proved, may be at any time the misfortune, of a country the question of whose naval increase is absolutely in the control of laymen, that the additions to the navy, both as regards the numbers and the types of new

ships, may be made with very little, if any, reference to the pressing needs of the hour, or to a carefully-thought-out programme, whose provisions are based upon a farsighted and statesmanlike view both of the present trend of events and of the probable developments of the future. Whether we like the thought or not, we are boldly launched upon the tempestuous sea of international politics; for the possession of the far-distant Philippines has rendered us ten-fold more open to attack by a naval power than we were before the first gun of the Spanish-American war was fired. With other naval powers bending every effort to increase their fleets, to reorganize their personnel, and maintain their standing as to number and efficiency, the failure of Congress to authorize a single battleship or cruiser becomes doubly deplorable. Are the country's representatives perhaps without the necessary technical advice as to the requirements of the navy? We think not; for there is in Washington a board composed of leading officers of the line and staff whose special duty it is to keep Congress informed as to the naval situation, and our particular requirements as a naval power, and these requirements are regularly placed before Congress in an annual report of the Board. The plea of ignorance, therefore, cannot be urged; and one is driven to the conclusion either that Congressmen are guilty of amazing indifference, or that they are willing to make the interests of the navy, which are just now, or may soon become, the most vital interests of the country, the sport of contending political factions.

Two years ago the SCIENTIFIC AMERICAN showed in a careful analysis of the seven leading naval powers of the world that the United States came fourth, with Germany as a very close competitor. It was pointed out at the time that, whereas the increase of our navy depended upon the caprice of Congress and might be great or little according to the temper of that body in each particular year, the Germans, with characteristic method and thoroughness, had conceived and were carrying out a programme of construction, which was to extend over a couple of decades and insure that a certain number of ships would be commenced and a certain number completed each year. Since then Germany has not only been steadily at work upon this programme, but she has drawn up and committed herself to a second or even more ambitious programme. The two schemes together have already placed that power on a par with ourselves; and by next year, thanks to Congress, we shall have taken the fifth position with the prospect of being steadily outdistanced by a power whose trade and spheres of influence in the South American Continent are growing by leaps and bounds.

LAKE VESSELS FOR THE ATLANTIC TRADE.

Some years ago it was confidently expected that the whaleback type of vessels which has done so much for navigation on the Lakes, would eventually become a factor in the Atlantic trade, and although a number of vessels of this type entered into the ocean trade some years ago, and have met with no little success, they have not made the advancement in the ocean trade that had been hoped for this type of vessels. Whaleback barges owned by Rockefeller are now, however, en route to Europe, having refitted at New York for the sea service.

Of the ten vessels under construction in Lake shipyards for the Atlantic service four are practically completed. These are owned by the International Steamship Company, a concern organized early in the year. These four vessels will serve as freight carriers between New York, Cuba, Porto Rico, and South America. Four steamers are under construction at South Chicago for a syndicate composed of New York and Chicago capitalists, and they will form the nucleus of a big fleet of carriers which will engage in the packet freight and grain trade between Chicago and Liverpool. Owing to the limitations of the Canadian canals connecting the Lakes with tide water all the vessels being built at Lake shipyards for ocean service are about 250 feet in length, but all interested in Lake shipping are hoping for the time when American canals of a greater capacity will be opened.

The new vessels of the International Steamship Company afford good examples of the Lake craft now being constructed for the Atlantic trade. These vessels have a length of 256 feet over all and a length on keel of 252 feet. The molded breadth of the steel hull is 42 feet, and the molded depth is 26 feet 5 inches. These vessels are fitted with quadruple expansion engines, with cylinders 15, 23, 35 and 54 inches in diameter, which will be supplied with steam by two Babcock & Wilcox water tube boilers, with a steam pressure of 250 pounds. The argument of builders of regular ocean craft that a vessel's machinery must be located amidships is disputed by the builders of Lake vessels, and the boilers and engines of all these Lake craft for the Atlantic trade will be located aft, and thus, by the special hull construction, they will be able to carry larger cargoes than the regular

ocean vessels of like draught. By thus carrying the same cargo as is now carried by regular ocean craft of greater draught these ocean-going vessels will be able to discharge cargoes at those ports, where lighter systems are now in vogue, without the use of lighters, and thus they hope to outbid the regular sea-going craft for such trade.

The "Tampico" and the "Eureka," two first-class steel ships which traded on the Lakes during the season just closed, are on the coast. They are sister ships and models of their type. As they possess a very large carrying capacity they can be operated at a comparatively small expense. The "Simon J. Murphy" is another type of Lake ocean-going vessel which was built last summer. The Rockefeller interests, among other large Lake shipping concerns, will now give the Atlantic shipping business a thorough test, and in case there is a reasonable chance of profit a large fleet of these boats, many of them of the whaleback type, will be sent to the coast next fall. The Carnegie Steel Company, Limited, last year dispatched the steamer "Monkshaven" from Conneaut, Ohio, to England, laden with a cargo of 1,001 tons of steel billets, this being the first Lake vessel to carry the product of this great iron and steel firm abroad. After passing the Canadian locks she took on a shipment of pulp wood. Were it not for the locks she could carry direct from the Lakes 2,000 tons of steel. The Carnegie Company have under construction a number of vessels which are being built with a view to engaging in the ocean carrying trade, and it is now proposed to ship much of the product of this great manufacturing concern to Europe via the Lakes. The vessels being constructed by the Carnegie Company will engage in the ore-carrying trade during the open season on the Lakes, and in the winter will be dispatched with cargoes of finished product to Europe, and, during the season, will ply regularly between the Atlantic coast and European ports, and thus carry much of the trade of the Carnegie Company now shipped by the regular ocean lines.

GOVERNMENT ECLIPSE EXPEDITION.

BY MARY PROCTOR.

The Government Eclipse Expedition sailed from San Francisco for Sumatra on February 16, on the transport "Sheridan," which will take the members as far as Manila. There a man-of-war from the Asiatic station will be set apart for their use during the remainder of the trip as far as Padang, in the island of Sumatra. The expedition is sent for the purpose of observing the total eclipse of the sun which occurs May 17, 1901.

The entire expedition has been planned and the preparations carried out under the personal direction of Prof. S. J. Brown, Director of the United States Naval Observatory, Washington, D. C. However, he was unable to accompany the expedition, which is consequently placed in charge of Prof. A. N. Skinner, of the Naval Observatory.

The names of the astronomers who are to accompany the expedition are as follows: Prof. A. N. Skinner; Prof. W. S. Eichelberger, assistant astronomer; Prof. F. B. Littell, G. W. Peters, L. E. Jewell, and W. W. Dinwiddie, of the United States Naval Observatory staff.

From the other observatories are Prof. E. C. Barnard, of the Yerkes Observatory; Dr. W. J. Humphreys, of the University of Virginia; Dr. S. A. Mitchell, of Columbia University, N. Y.; Dr. N. E. Gilbert, of Johns Hopkins University; Dr. H. H. Curtis, formerly of the Lick Observatory, now assistant in the Leander McCormick Observatory.

The "Sheridan" was expected to reach Manila by the middle of March, and Padang by the first of April, leaving nearly two months for preliminary operations in Sumatra. This is of special value, since there may be many difficulties to overcome with regard to the transportation of instruments and in making a careful search for desirable locations for the observing stations, which are to be distributed along the shadow-path. As soon as these important facts are determined, the instruments will be assigned to the different observers and set up in place.

According to the programme arranged by Prof. S. J. Brown, the work will consist of photographic, spectroscopic, and polariscopic observations, in addition to the usual visual work. Prof. Barnard will be stationed at Solok, near the central line, and expects to photograph the corona on a large scale. He will use the cælostat which he employed so successfully at the last eclipse, besides using smaller apparatus.

At Fort de Kock, near the northern border of the shadow-path, Mr. Peters will occupy a position, using the 40-foot photoheliograph lenses of the Naval Observatory, two of which gave very fine results at the last eclipse when used at Barnesville and Winnsboro. Two other photographic instruments will be used to test the value of photographing with visual lenses, using some form of screen to cut out the violet light. The results at Barnesville in this direction were so successful at the last eclipse that they show that this method