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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.

FINAL COMPLETION OF THE CROTON RESERVOIR.

Although the gates of the Croton reservoir were closed for the first time in the spring of last year, and that event was generally taken as marking the completion of the great work, as a matter of fact the crest of the dam had not at that time been carried up to its full height, nor had anything been done on the erection of the fine arched span, which now forms a connection between the crest of the main dam and the rocky bluffs which form one wall of the spillway. During the intervening months, the great mass of masonry which constitutes the dam proper has been carried up to its full height, and the broad roadway has been completed across its crest from the northerly to the southerly abutment. The crest of the spillway was the last portion of the stonework to be completed to its full height, and on January 17 of this year the Comptroller of the city of New York, as representative of the Mayor, laid the last stone, thus putting the great wall of masonry in position to hold the waters of the impounded lake up to the high-level mark which represents the reservoir's capacity of about 30 billion gallons of water. In our issue of April 15, 1905, we gave a complete series of views of this noble work, including some of the steel bridges which carry the new driveway over various arms of the lake, and form important elements of the splendid driveway which runs entirely around the reservoir.

Quite apart from its priceless value as forming the most important element in the water supply of the capital city of the New World, the Croton reservoir is destined to become, in future years, one of the most picturesque sections of the magnificent system of boulevards and driveways which extends from Riverside Drive and Lafayette Boulevard up the easterly bank of the Hudson River. With the construction of the Hudson Memorial Bridge, and the improvements in grading and in surface which are bound to take place on the Albany Post Road, there will be no finer automobile trip in the State, both for the picturesque beauty of the country and the wide variety of interest, than a run to the Croton reservoir by way of the Hudson, and a trip over the splendid roads around the lower portion of this lovely artificial lake.

SHIPBUILDING IN THE UNITED STATES.

Were it not for the orders obtained by our shipbuilding yards for the construction of United States warships, and other government vessels such as revenue cutters and lighthouse tenders, it would be difficult for many of these establishments to keep their costly plants in operation. This is particularly true of the larger plants located on the Atlantic and Pacific seaboard. Thus we find that during the fiscal year ending July 1, 1905, there were under construction or under contract in the shipyards of the United States seventy-six steel merchant vessels, of 190,903 tons, and thirty-nine steel government vessels, of 308,702 tons; so that the amount of work being done for the government (most of it for the United States navy) was over sixty per cent greater than the work being done for private shipping concerns. Even more remarkable were the conditions in 1904, when the merchant tonnage was only 94,988 tons, as against 331,435 tons that were under construction for the government. In the presence of these figures, it would be well for those people who are bitterly opposed to the upbuilding of our navy to bear in mind that our warships not only serve as guardians of the peace (for which they are just as essential as the police of our cities) but the very act of their creation has served to keep alive the important shipbuilding interests of this country. Indeed, the absolute cessation of new naval construction would involve the closing down of several of our building yards.

The merchant marine of the United States, including all kinds of documented shipping, comprised on July 1, 1905, 24,681 vessels, of 6,456,543 tons. About one-half of this amount was afloat on the Atlantic and Gulf coasts, one-third of it on the Great Lakes, while on the Pacific coast the total amounted to 793,088 tons, the small remainder being found at the Hawaiian Islands and on the western rivers of the United States. During the year, 1,102 vessels of all kinds, great and small, were built, the total tonnage amounting to 330,316 tons. Of this total, 40,000 tons consisted of steel steamers, including the big "Dakota" of over 20,000 tons; 14,149 tons consisted of steel ferry, river, and bay steamers; and 29,104 tons of wooden schooners; while the importance of the Great Lakes shipbuilding interests is shown by the fact that the total tonnage of new steel steamers built there during the same year was 101,521 tons. Comparing the total gross tonnage of the American merchant marine, as given above, with that of our most formidable competitors, we find that for 1905 the total tonnage of the German Empire amounted to 3,517,673 gross tons, of which 2,888,693 tons represent steamship tonnage; while the total shipping of the United Kingdom and British Colonies for the same year is 17,900,720 gross tons, of which all but 1,600,182 tons represents steamship tonnage. In many of our readers the decline of the American schooner will arouse some sentimental interest. The far-famed New England schooner, with its generous beam, lofty spars, and perfectly fitting canvas, was unquestionably the pioneer of the foreign trade of the United States. To-day, however, in spite of its stanchness, speed, and carrying capacity, the schooner, with the exception of a few ports in Africa and Australia, is being steadily driven out by the small steam-propelled trading vessel.

ARMY TRANSPORT AND THE MERCHANT MARINE.

Speaking of the shipbuilding of the United States, we are reminded that the great importance of the possession by the United States of an adequate merchant marine, because of its bearing on the question of army transportation over seas, was strongly brought out in a report which has just been compiled by the General Staff, and forwarded through Secretary Taft to the chairman of the Joint Committee on Merchant Marine. The General Staff is remarkably frank in its discussion of the transport service in the Spanish war. We are told, regarding the Santiago expedition of 1898, that the Quartermaster's Department chartered every American vessel that could be obtained in the Atlantic ports in the twenty days following the declaration of war, and that as the grand result of its efforts it obtained only thirty-six vessels of an average size of 2,500 gross tons, and that of these, only two were more than 4,000 tons. The report proceeds to say (we trust that Congress will lay the words to heart): "The official records afford ample evidence that the safe arrival was due to the good fortune of continued fine weather. A severe storm would have scattered the fleet, probably with great loss of life, and would have defeated the object of the expedition. This fleet of ships could not have embarked, under reasonable conditions, a force of more than 8,000 or 10,000 men, and when so embarked, the expedition could have been dispatched on a long voyage only at great jeopardy of the welfare of the men, and of the success of the enterprise."

It will be remembered that following the close of the Spanish war a considerable increase was made in our enlisted army; yet because of the smallness of our merchant marine, we are not to-day in a position to utilize this increased force in any adequate degree, at a distance from our own shores. According to the General Staff, it is a fact that now, and for some time to come, the force for which our military establishment is maintained cannot be exerted over seas. The first quick blow, so increasingly important, cannot be struck at all, nor can an expedition of any great size be embarked without delay, except by the use of foreign vessels. This condition of things cannot improve until the American seagoing merchant marine has increased in tonnage to approximately two and a half times its present volume. Moreover, the ships should be adapted in size and in design to quick conversion into suitable transports, and should be built under conditions which make their voluntary surrender to the United States, on demand, a foregone conclusion. We are informed that a single army unit such as a division with nine infantry regiments, one cavalry regiment, three artillery battalions, one engineer battalion, and one company signal corps, with the necessary hospital, ammunition, and supply wagons, would require for its transportation ten 6,500-ton ships and nine 5,500-ton ships. Two such divisions, representing, say, 25,000 men, could be provided with transportation in fifteen days, and they would require twenty of the larger and eighteen of the smaller ships.

But owing to the fact that these merchant ships, built under transport requirements, might at the occurrence of a crisis be more or less widely scattered, and because of other delays, such as extensive dockyard repairs, it is not possible to reckon that more than one-third of the vessels required could be made available in fifteen days. Hence, for every ship for which there is likely to be a call, there must be three afloat. That is to say, to be certain of transporting our little army of 25,000 men, there should be afloat in our merchant marine sixty of the 6,500-ton ships and fifty-four of those of 5,500 tons. Furthermore, since the crisis might arise either on the Pacific or the Atlantic, it would be necessary to have this number of ships, suitable for transport, afloat on each ocean, or a total of 228 vessels of a gross tonnage of 1,368,000 tons.

Now, in 1904, in the whole American steam merchant marine, there were only fifty-seven seagoing vessels of 4,000 tons and upward, with a total of 400,000 gross tons. It is not necessary to follow the argument of the General Staff any further to be convinced that in case of a crisis occurring, say, in Honolulu, the Philippines, Porto Rico, or Panama, requiring the instant dispatch of the very moderate force of 25,000 men, the army, because of lack of transportation, would find itself unable to give immediate response. Herein lies one of the most powerful arguments for the encouragement by the United States government of the efforts to upbuild our merchant marine.

TWO CENTURIES AFTER FRANKLIN.

On the 17th of this month occurred the bicentenary of Benjamin Franklin. Not only has posterity assigned to him his rightful position among the greatest and ablest of Americans, but foreigners as well early recognized those qualities of his masterly intellect which placed him among the foremost statesmen and men of science and letters. Undoubtedly his fame rests chiefly upon his public career, his services to his country as a statesman, diplomat, and patriot. An historical figure of international fame, his scientific attainments are overshadowed by his political eminence. And yet, the results of his scientific researches and investigations easily place him in the very front rank of scientific men of the world.

Few, indeed, of us have a proper appreciation of Franklin's work in natural philosophy and electricity. It is true that his classic experiment to prove the identity of lightning and electricity is known the world over; but so general is the ignorance of his other scientific labors, that this great discovery is often regarded merely as a fortuitous and chance occurrence. The utter absurdity of this belief needs no further proof than even slight acquaintance with his painstaking and unremitting study in this as well as other directions; and it is unquestionably true that this experiment was not the origin of a theory, but that it was the culminating test of a line of theoretical reasoning and investigation. Franklin's interest in things scientific was limited in range only by the limits of the knowledge of his time. His splendid versatility and intense interest in all phases of human endeavor led him into branches of knowledge where his remarkably practical mind and sound judgment produced contributions to science of undisputed value. So, his early investigations of chimney drafts were soon followed by the invention of a stove, which embodied the principles of the modern hot-air furnace and other devices of like character.

A subject which at this time possessed a peculiar fascination for him was meteorological investigation, and his knowledge and understanding of the general physics of the atmosphere were far in advance of his period. Franklin was probably the first to institute our present methods of tracing and recording storms from point to point, and his investigations of the Gulf Stream, for the first time using thermometric means of verification, were of great value to navigators. No strange occurrence or natural phenomenon was allowed to pass without investigation by the best means at his command. Thus his friend Priestley, in making public the account of his discovery of oxygen, at the same time published a letter from Franklin telling of an inflammable gas found in certain American rivers, known to-day as marsh gas.

Franklin's studies in electricity were, however, carried out farther and more thoroughly than his various activities permitted him to do with other branches of knowledge, and upon his electrical investigations rest his great claims to fame as a scientist. His introduction to this branch of science, then beginning actively to engage the attention of men of learning in Europe, was through a Dr. Spence of Boston, who possessed some crude apparatus and was acquainted with the work that had been done abroad. Franklin's interest was at once aroused, and his natural inclination to philosophic study of this character soon induced him to make electrical research one of the prime objects of his life, and a hobby which he did not relinquish until his death. Collinson, the English agent of the Library Company of Philadelphia, and the personal friend of Franklin, supplied him with existing English literature on the subject, and soon sent him Dr. Watson's book, as well as one of the tubes used in the experiments. Franklin eagerly took up the closer study of electrical phenomena, and in 1747, with three others, Kinnersley, Hopkinson, and Sing, conducted the famous "Philadelphian experiments," showing the "effect of pointed bodies both in drawing off and throwing off electrical fire." It is almost certain that in these investigations Franklin copied very little from the European investigators; in fact, his scientific surroundings in America almost precluded this possibility. In all probability, he at this time reinvented the static