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A PERIL TO THE NAVY.

Our finest armored cruiser, the "Brooklyn," is now in dry dock at the Brooklyn navy yard, having her hull patched up, straightened out and generally bent back into shape. It is only a few weeks since the battleship "Massachusetts" was in the same dock, undergoing the same treatment. In both cases these fine ships were disabled within a mile or so of the Brooklyn navy yard and at a time when they were steering a correct course through the proper harbor channels. The "Massachusetts," when the mishap occurred, was on the way to join Admiral Sampson's squadron, and though she was fully equipped for sea, with all stores on board, and down to her maximum draught, she should nevertheless have had ample water in the channels between the navy yard and the sea. As it was she grounded heavily on the Diamond Shoal, a reef that extends into the channel from Governor's Island, and received injuries which took many months to repair and cost the government about $50,000. The "Brooklyn" grounded, or struck a sunken obstruction, when in mid-channel between Governor's Island and the Battery, on her way to the Decoration-day services at Grant's Tomb. Her bottom plates were indented, rivets sheared off, and damage done that will cost about $8,000 to repair.

How long is this kind of thing to continue? If the recurrence of such preventible disasters were not suggestive of the grave perils to which the navy is exposed, it would become positively ridiculous—with such imperturbable gravity do we wreck our ships, and then proceed to patch them up again at so many thousand dollars apiece. The wonder of it all is that these obstructions were not removed from the channels years ago, when our first deep-draught warships were constructed. Surely it was not necessary for the "Massachusetts" to smash up $60,000 worth of her bottom to convince us that Diamond Shoal was a reality, and not a fiction—a few fathoms of sounding line would have done that; and if there are sunken wrecks encumbering the channels of New York Harbor, it is surely a doubtful policy to use the bottom of the "Brooklyn" as a dragnet to determine their whereabouts.

We know nothing in all the river and harbor work of the War Department that compares in urgency with this problem of the approaches to the Brooklyn navy yard, and how it should come to be thus neglected is a mystery. Just beyond Governor's Island, skirting the Brooklyn water front, a channel 1,500 feet wide and 40 feet deep is to be constructed along the front of a series of docks into which a 25-foot draught ship will rarely enter; yet the ships of the navy are allowed to pass to and fro in peril for the want of a little dredging which would cost not a tithe of the millions that are to be spent on the above-named work.

WHAT POOR ROADS COST OUR FARMERS.

If ever there were two classes of people that had a good cause in common they are the bicyclists and the farmers. The question on which their interests agree is that of the need for good roads; for while a hard, smooth surface is an absolute necessity to the wheelman, it is of even more vital importance to the farmer, seeing that the condition of the roads makes a serious difference one way or the other in his yearly profits. As the result of an inquiry made in 1895 by the United States Department of Agriculture, replies were received from over 1,200 counties giving the cost of hauling crops in various parts of the United States. The average load hauled was found to be 2,002 pounds; the average length of haul, $12\frac{1}{10}$ miles; the average cost of hauling a ton of crops to market was $3.02; while the average cost of hauling a ton for a distance of one mile was 25 cents.

In order to compare the roads of the United States with those of Europe the bureau through its consuls made careful inquiry on the subject of cost of hauling in England, France, Germany, Belgium, Italy, and Switzerland. The average cost of hauling one ton one mile was found to be in England 10 cents, in France 10 cents, in Germany 8½ cents, in Belgium 9½ cents, in Italy 7½ cents, and in Switzerland from 6 to 8 cents, the average for all these European states being $8\frac{6}{10}$ cents per ton per mile. More than one cause may enter into this determination of cost, but that the great cost in America is due to our poorly made dirt roads is proved by the fact that while over the superb roads of Europe a farmer will haul three or four tons at a load, our farmers are able to haul only a ton or less than a ton over the "plow and scraper" ridge of soil which even at this late day is dignified by the name of road in many parts of the country.

THE NEW CANAL COMMISSION.

Bearing in mind the vast interests at stake, we do not hesitate to say that the new canal commission, recently appointed by the President, is the most important engineering commission of modern times. Not only has it to decide whether this country is justified in undertaking a work which is estimated to cost over $130,000,000, and may easily cost 30 or 40 per cent more than that, but its report will determine indirectly whether another important work—the Panama Canal—in which over $156,000,000 has been already expended, shall be completed or abandoned.

It requires no very intimate knowledge of the canal question to prove that only one canal is required at the Isthmus, and that not more than one will be built. It is also evident to any one who is not blinded by national prejudice that a great maritime highway like this should be, and in the very nature of things must be, broadly international in the policy of its administration. As the matter now stands, there are two great rival projects before the public—one two-fifths completed and the other not yet commenced. Each has features to recommend it, although engineering, commercial, and military considerations point strongly to the completion of the Panama Canal as the most feasible scheme.

Although the present commission has been appointed for the ostensible purpose of examining all routes that are plausible, it is well understood that its chief duty is to determine which of the two routes, Nicaragua or Panama, has most to commend it to the active support of the United States government. To assist it in this work it will find a vast amount of engineering data ready to hand. At Nicaragua, in addition to the early surveys of Childs and Lull, it will have the Menocal surveys and those of the Ludlow and Walker commissions. At Panama it will find a complete set of surveys, plans, observations, etc., in such shape as to allow of active construction being undertaken at brief notice.

The commission includes Admiral Walker, Prof. Haupt, and Col. Hains, the former commission; Alfred Noble, of the Ludlow commission; two additional engineers, viz., Lieut.-Col. Oswald H. Ernst, of the United States Army, and George S. Morison, a former President of the Society of Civil Engineers; Prof. Wm. H. Burr of Columbia and Prof. Emory R. Johnson of Pennsylvania and Senator Pasco of Florida. There are thus two engineers from the army, three from civil life, two college professors, a senator and an admiral of the navy. One million dollars has been appropriated to cover the expenses of the investigation, which, all things considered, should be of such a character as to settle the question, as far as the United States is concerned, once and forever.

COMMERCIAL VALUE OF WIRELESS TELEGRAPHY.

A striking evidence of the growth of scientific knowledge and the fidelity with which the scientific press safeguards the public against glaring scientific falsehood, is found in the recent attempt to produce a panic among the shareholders in telegraph and cable companies on account of the success of wireless telegraphy. It was otherwise twenty years ago, when the extravagant claims put forth for electric lighting caused the holders of gas shares to dispose of their valuable holdings. In vain did the scientific press urge moderation, pointing out that the cost and difficulties of the new system of illumination would prevent it from driving out gas lighting—at least for some years to come.

Remarkable as have been the results obtained with wireless telegraphy across the English Channel, there is nothing to warrant the belief that wire telegraphy is doomed. There is one radical difficulty which, alone, is sufficient to restrict wireless telegraphy, at least in the present stage of its development, to a very limited range of practical application. We refer to the fact that no means has yet been devised by which the wireless messages can be directed exclusively to the station for which they are intended. Before wireless telegraphy can be used for general commercial purposes some method must be devised whereby, as in wire telegraphy, the transmitter can communicate with one particular receiver to the exclusion of all others, and the receiver can exclude all messages except the particular one directed to it. Until this is achieved the new system must be barred from the field of ordinary commercial work.

A limitation affecting long distance telegraphy is also found in the fact that the length of the vertical rod has a definite relation to the distance through which the message is sent, and as the mast used in the channel experiments, where the distance was 30 miles, was 177 feet high, it can be seen that this consideration also imposes a limit upon wireless telegraphy. Marconi has recently stated that the present limit of distance over which messages can be sent is about 80 miles; evidently then the problem of trans-ocean telegraphy by this system is far from solution. As a matter of fact, the inventor, with his characteristic modesty, has refrained from making any claims for his system except along those lines in which he has clearly demonstrated its usefulness. The most valuable application of the system is that which was successfully tested at the South Foreland, England, where now for some time wireless telegraphy has been in successful operation between the shore and the lightship. It has been proved that the apparatus is not affected by wind or weather, and we now know beyond question that it is possible to give infallible and early warning to shipping of the presence of dangerous shoals.

MUNICIPAL BATHING ESTABLISHMENTS.

In the United States too little attention is paid to the individual comfort of its citizens. Everything is done for their safety, but in many little ways we are still far behind our transatlantic brethren. One of our greatest municipal defects is the lack of public baths. It is not necessary to dwell upon the need for public baths among all civilized peoples, the virtue of water and soap is conceded. Unfortunately, among the poorer classes it is not always possible for them to obtain adequate bathing facilities in the densely populated districts in which they live. Public baths properly constructed and handled form one of the most effective and far-reaching of municipal institutions for the promotion of cleanliness, good health and good citizenship. Boston, Mass., is a notable exception to the average American city as regards the bathing facilities which this city furnishes to her inhabitants. The experiments of Boston are highly instructive to all cities looking to civic development in the direction of ministering to the practical and essential needs of a community. Public baths in Boston date from 1866, and these were, we believe, the first public baths to be established by a municipality in this country. At first provision was made for a system of baths distributed at various points on the long shore line rather than for a few central establishments according to the British plan. Five floating baths were constructed at that time, and the general type was a low wooden building supported on a floating platform. Within each was a shallow tank through which the water flowed freely, air and light being admitted through the roof. The usual dressing rooms, etc., were provided. These proved so satisfactory that now there are ten of these floating baths.

In 1898 the number of bathing establishments was raised to twenty-three and there were 2,000,000 bathers, an increase of one and one-quarter millions over the previous year. New styles of floating baths have been devised in which the tank is left open to the sky and the capacity of one of them is 1,200 to 1,500 persons per day. In addition to the floating baths two swimming pools were established to supply the wants of the population which lives in the center of Boston. One of them is located in the small park contiguous to the tenement district of Roxbury, fresh water being supplied to the tanks by the city water works, 80,000 to 90,000 gallons being used per day, and from 1,200 to 1,500 patrons daily attend this bath. Men are allowed to bathe in the early morning and evening, the boys in the forenoon and girls and women in the afternoon. That a pool of this kind is not necessarily an expensive luxury will be seen when it is said that it cost only $2,000 to complete it.

The most important of Boston's beach baths is at the North End Park, which, with its pleasure piers and improvements, cost the city $350,000. Frequently 5,000 people bathe per day at this point. The baths which we have mentioned so far are, of course, restricted to summer use; but a new public bath house, open all the year around, will be opened on June 15. The building is most substantial and is thoroughly fireproof. Separate bath rooms for men and women are provided on the second floor, and ample waiting rooms occupy the first floor. The men's rooms are provided with thirty inclosed shower baths and three inclosed tubs, while the women have eleven shower baths and six bathing cabinets. Each shower cabinet contains a dressing alcove and seat. All the partitions are of marble and the fittings are of the latest sanitary type, and the bather can regulate the temperature of the water flowing from the spray as desired. The tubs are of heavy white porcelain, with nickel-plated fittings, and it is doubtful if there is any more real comfort to be obtained in the luxurious bath rooms of the Back Bay district.

In the practical working of the entire system in Boston, fatalities are practically unknown. Swimming instruction is given to thousands and remedies are provided for use in case of cramps or other illnesses. In

order to connect the baths more closely with the city schools, the head swimming instructor visits the public educational institutions before the close of the school year and teaches the children the motions of swimming. The aim in Boston has been to dignify the practice of bathing and to furnish an innocent recreation and to cause the people to regard bathing establishments as necessary to their well-being as the water supply, school house, library, or parks. The course of Boston in this matter cannot be commended too warmly, and the object lesson is of great value outside of the immediate advantage to her citizens.

CALIFORNIA OLIVE INDUSTRY.

The olive is one of the oldest known fruits. It is noted by Pliny and is frequently mentioned in the Bible, where it forms the basis of many parables and figures of speech. In Grecian mythology the olive tree occupies an important place, and to-day the "olive branch" is the world symbol for peace. The olive tree itself is rather melancholy in appearance, but the eye soon becomes accustomed to the tone which the olive trees give to the landscape, and in nearly all of the Mediterranean countries they are found almost everywhere. In general, the olive will flourish wherever the vine can be cultivated for wine-growing purposes. It will not bear a temperature below 21° or 22° F., and in Europe it cannot be grown above 46° latitude. The young plants and fruit are very delicate, but the tree itself is quite tough. Naturally, in Italy, where the olive forms one of the principal agricultural products and contributes so largely to the wealth of the country, the trees are cultivated with the greatest care. The kernel of the olive requires about two years to germinate naturally, but it is found by mixing clay and goat manure nature's processes can be hastened so that it will germinate the same year. The trees attain great age, and a large olive tree near Nice is believed to be a thousand years old and is said to have yielded 500 pounds of oil in a single year.

The culture of the olive in the United States is increasing rapidly, and in California the industry has attained such proportions that already $500,000 is invested in it. Olives were first introduced into the State by the Franciscan Missions almost a century ago. The oldest olive trees in Califoria date from the last century. They are six in number and are stationed at the San Gabriel Mission and are still bearing fruit and are a living monument to the wisdom of the Franciscan Brothers. According to some authorities, the oldest tree is at the Capistrano Mission, thirty miles south of Los Angeles. The seed from which this tree was grown came from Corsica in 1769. It is now 50 feet high and the trunk is at least 5 feet in diameter. The old trees at the Missions are as robust and thrifty as when they first commenced bearing fruit. The Franciscans raised most of their trees from cuttings which they brought from Spain. They found the soil and surroundings most congenial for olive raising, and that the trees flourished even better than on their native soil. The oil enabled the exile of the Fathers to be more supportable by supplying one of the accustomed luxuries of their far-away homes in distant Castile.

The modern history of the California olive culture began about twenty years ago, when the Hon. Ellwood Cooper, of Santa Barbara, who is regarded as the father of the industry, began his investigations on raising the olive as a commercial possibility. He first secured cuttings from the trees of the old Mission and set out a number of olive orchards in Santa Barbara and other places. The result has amply justified his venture. Now there is hardly a part of the State that has not its olive orchard. The olive seems to thrive best under the influence of sea breezes. It takes to almost any character of soil where the drainage is good and flourishes in the localities beyond the range of very heavy frosts. The tree does not require a great deal of attention, and does not resent neglect. The care of an olive orchard is less than for almost any other kind of fruit. The trees are highly symmetrical when grown, and on some ranges are planted along the roadside for the shade and the added beauty which they afford to the landscape. Olives are almost never raised from the seed, as this requires a long time. They are usually raised from cuttings, and have been produced by Mr. Cooper in the fourth year, and a good crop in seven years; 122 pounds is the average per tree. The method of propagation requires constant attention and great experience, but the plants are grown on such an enormous scale the cost of them is very small. In the spring, after the cuttings are rooted, they are transferred to olive-growing nurseries, where they become trees of from three to five feet high in from twelve to eighteen months.

In California opinions are much at variance regarding the variety of olive to grow. Formerly the Mission was the only olive planted. In recent years many different varieties have been brought from Europe. Different locations may require different varieties, but above all other considerations is the quality of the oil produced. The varieties that make the best oil should be selected in all cases, provided that quantity is a fair average to a given acreage planted. This rule is also applicable as well for pickling unless the fruit is too small for economic handling.

Mr. Cooper has trees twelve to fifteen years old which yield 250 pounds of olives, but they do not bear every year. It is estimated that there are now no less than 24,223 acres of olive trees in California, with 1,162,739 trees, of which half are now bearing. The soil must be occasionally cultivated and the trees must be pruned and sprayed to exterminate numerous insects. The greatest drawback to the successful cultivation of the olive is the black scale.

Olive oil making is a simple process; the quality depends on the care exercised from the picking of the fruit through every stage of manufacture until it is put into bottles and corked. About 8½ pounds of olives are required to a large bottle of oil. The fruit is gathered later in the season than other crops, and in the best orchards the olives are plucked one by one from the branches and not shaken from the trees or allowed to drop. Special ladders mounted on wheels are run among the branches of the trees, and the pickers ascend the ladders and pluck the olives, which they drop into a specially made device, usually of tin, strapped about the waist, and which is adapted to hold a considerable amount of fruit.

The olives must not be allowed to stand in heaps, in sacks or any sort of package long enough to heat through, otherwise the oil will become musty and rancid. Absolute cleanliness is required in every step of the process. The olives are first dried, during which process they lose about half of their weight; they are then crushed by a heavy stone rolling over them, and are next pressed the same as in cider making. The first expression is what is known as the "virgin" oil; the lower grades follow in succession. There are at least a dozen oil mills in the State of California.

A considerable part of the olive oil imported is adulterated by cotton seed and other oils, but now with the splendid olive oil made in California there should be no difficulty in getting the pure article in any part of the United States. It is a mistake to believe, however, that absolutely pure olive oil made in Southern Europe cannot be purchased here. It is expensive, but it can be bought; but the ordinary olive oil bought of grocers is apt to be adulterated, if it is not entirely fictitious. Large quantities of olives are pickled in California and are shipped in bottles or small barrels.

The olive industry is an example of what may be accomplished in the way of introducing a new agricultural pursuit in the splendid South west.

THE WORLD'S COAL PRODUCTION.

The coal production and consumption of the world during the past fifteen years are presented in some tables just prepared by the Treasury Bureau of Statistics. These show that while the United Kingdom is still the largest coal producer of the world, the United States is a close second, and if the present rate of gain is continued, will soon become the leading coal-producing country of the world. The coal production of the United Kingdom in 1897 was 202,000,000 tons; that of the United States, 179,000,000 tons; Germany, 91,000,000; France, 30,000,000; Belgium, 22,000,000; Austria-Hungary, 12,000,000; Russia, nearly 10,000,000; Australasia, nearly 5,000,000; Japan, over 5,000,000; British India, 4,000,000; Canada, nearly 4,000,000; and Spain, 2,000,000, while no other country reached 1,000,000 tons in production. The United States, however, has gained much more rapidly during the fifteen years under consideration than has the United Kingdom, or, indeed, any of the important coal-producing countries of the world, her gain during the fifteen years being over 73 per cent and that of the United Kingdom less than 24 per cent. The announcement just made by the Geological Survey that the coal product of the United States in 1898 was 219,836,000 short tons against 226,287,000 for Great Britain shows that the United States is rapidly gaining upon that country as a coal producer, and will soon become the leading coal-producing nation of the world.

As an exporter of coal, however, the United States takes low rank in proportion to its production, and stands fourth in the list of coal-exporting countries. In 1897, the exportations of coal from the United Kingdom were 48,000,000 tons; from Germany, 12,000,000 tons; from Belgium, over 6,000,000; and from the United States, a little less than 4,000,000, though in 1898 the quantity exported was slightly above 4,000,000 tons. Australasia comes next to the United States as a coal-exporting country, her exports amounting to nearly 3,000,000, tons, while France exported about 2,500,000, Japan 2,000,000, and Canada about 1,250,000 tons in 1897.

France is the largest coal-importing country, her importations in 1897 being nearly 12,000,000 tons, while Germany imported 6,000,000; Austria-Hungary, 5,600,000; Italy, 4,250,000; Canada, nearly 4,000,000; Belgium, nearly 3,000,000; Russia, 2,500,000; Sweden, over 2,250,000; the United States, nearly 1,500,000; and Australasia, 1,000,000 tons, while no other country imported as much as 1,000,000 tons.

Great Britain is also the largest consumer of coal in proportion to population, her coal consumption in 1897 being 3·87 tons per capita, that of Belgium 2·70 tons, the United States 2·42, Germany 1·58, Canada 1·25, France 0·98, Australasia 0·97, Sweden 0·50, Austria-Hungary 0·37, Spain 0·19, Italy 0·13, Russia 0·09, and Japan 0·07 of a ton per capita.

According to these figures, which are summarized from a report of the production of the principal countries of the world, just issued by the British government, the United States now produces about 30 per cent of the coal of the world, the coal production of the fourteen countries enumerated being in 1897, 566,000,000 tons, of which the United States produced 179,000,000, while in 1883 she produced but 27 per cent of the total product. The 1898 figures make an even more satisfactory showing for the United States.

THE DEATH OF FRANK THOMSON.

The American railroad is celebrated all over the world on account of the extent of the various lines, and the system and enterprise upon which they are conducted. Successful railway management calls for qualities akin to those of statesmanship, and this must be combined with technical training and business ability of the most exacting kind. Mr. Frank Thomson, of the Pennsylvania Railroad, who died on June 5, was the type of such a railway president. As the head of one of the largest of our systems, he had an opportunity which is given to few men, and he had a faculty for divining public needs before the public itself was aware of the fact. It is to him that we owe the introduction of our present dustless stone roadbeds, our block signals, and the system of prizes for faithfulness and great efficiency. It will readily be seen that the debt of the traveling public to Frank Thomson is very great.

Mr. Thomson was born at Chambersburg, Pennsylvania, in 1841. He entered the Pennsylvania Railroad shops at Altoona at the age of seventeen years, after a rudimentary education in the local schools. In four years at the Altoona shops he mastered all the mechanical principles of railroad engineering. His energy and ability were promptly recognized by the General Superintendent of the road, and when the war broke out, young Thomson was put in charge of the military railroad. He restored the Orange and Alexandria and the Loudon and Hampshire railroads. He also played an important part in the construction of the road across the "Long Bridge," over the Potomac, at Washington. In 1862 he reported for duty on the military route south of Nashville. After his return to Washington he assisted Col. Scott in the transportation of 20,000 men to the relief of the Army of the Cumberland. He enjoyed the rather unique distinction of being called to a Council of War in 1864. When he arrived in Washington, the Council was convened in Stanton's bedroom, where the latter lay sick. The War Secretary said on seeing him, "Is it possible that we waited for three days to get the opinion of that red-headed stripling?" The opinion given by the stripling was so conclusive, however, that the movement projected was not made. In 1864 he was appointed Superintendent of the eastern division of the Pennsylvania road; in 1873 he was made Superintendent of motive power. Soon afterward he became General Manager, and in this capacity he introduced the standard track, solid roadbed, the system of track inspection and the award of prizes for the best sections of track. He was a good disciplinarian, and the high grade of efficiency for which the Pennsylvania Railroad is noted is largely due to him. In 1882 he became the second Vice-President, and in 1897 he succeeded George B. Roberts as President of the road.

Mr. Thomson was a splendid example of what a bright young man can accomplish in America provided he has reasonable opportunities for the display of his talent.

TRADE WITH CUBA AND OUR NEW POSSESSIONS.

American producers are already finding an enlarged market in Cuba, Porto Rico, Hawaii, and the Philippines, as is shown by the figures of the Treasury Bureau of Statistics, which indicate that the exports of the fiscal year, which ends with the present month of June, will show a larger exportation to Hawaii and the Philippines than ever before, and larger to Cuba and Porto Rico than in any previous year, except those in which the reciprocity features of the McKinley law were in operation.

The total exports to Cuba, Porto Rico, Hawaii, and the Philippines in the full fiscal year will be about $30,000,000, against $17,000,000 last year. Our sales to these islands for the fiscal year 1899, even under the unsettled conditions which have prevailed in most of them, exceed those of any previous year, save those of 1893. Of course, these figures do not include any of the supplies sent by the government to any of its troops in the islands.

It is also interesting to know that the exportations to Spain are approaching their normal conditions; those for the ten months ending with May were $8,000,000, against $10,000,000 for the corresponding months of last year.