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NEW YORK, SATURDAY, MAY 5, 1900.

REVIVAL OF THE AMERICAN MERCHANT MARINE.

At the present time the majority of the shipping trade of the world is in the hands of Great Britain. Less than half a century ago the leading position was held by this country, which not only possessed the largest tonnage, but was acknowledged to produce the fastest, and in every way the best appointed ships that sailed the high seas. To-day, our deep-sea trading fleet is not only insignificant in comparison with that of the leading maritime nations, but it is ridiculously disproportionate to the resources, the skill and the feverish energy of the nation under whose flag it sails.

The decline of American shipping dates from the Civil War, when the depredations of the Confederate privateers drove into the hands of other nations that portion of our carrying trade which it did not destroy on the high seas. The failure to rehabilitate our merchant marine is not to be attributed to lack of enterprise, but to the diversion of capital into fields where there was a more pressing call and a promise of more speedy results. At the close of the war the energy of the American people was so completely devoted to the internal development of the country by the construction of railways and the building up of industrial establishments, that no attempt was made to save the wreck of our splendid merchant marine, which was left to be completely broken up by the storm of competition which beat upon it with steady persistency.

There was another agency which contributed to our decline, working less swiftly, but, perhaps, with even more potent effect; we refer to the change in the materials of construction and in the motive power of modern vessels as exemplified in the steam-propelled iron ship. Great Britain was quick to adapt herself to the new order of things, and shipyards were reorganized, and multiplied with such rapidity that she at once assumed a position so commanding that it has never yet been disputed. Had the United States deferred her internal development for another decade, and put into the construction of rolling mills and shipyards the wealth and labor which she expended so liberally in covering this country with a network of railways, we think it is not unlikely that we would have held to-day the position now occupied by Great Britain.

At the close of the century we have reached a point in our industrial development where, great as is the extent of the country, large as is its population, production has overtaken and far exceeded the demand. We have built enough, and more than sufficient, railroads; our establishments in many lines of manufactures have a capacity considerably in excess of the demands of the home market; and we are now pushing out into a world-wide competition which, brilliantly begun, is full of even brighter promise for the future. Among the fields of national enterprise that excite our interest, we know of none that should appeal more strongly to our national pride than that of resuscitating our merchant marine and striving to regain, if not the leading position in the shipping trade, one that shall be at least fairly commensurate with our national importance. Among the beneficial results of the late war is the stimulus which it has given to the shipping industry. Our over-sea possessions and our ever expanding foreign trade are creating a demand, the reply to which is seen in the fine fleet of vessels, illustrated in this issue, which are now being constructed on the Delaware and the Clyde. While this activity, however, is gratifying, we must not for a moment imagine that it is on a scale that will do much towards placing us as a maritime people where we properly belong. This can only be accomplished by the adoption of some such sweeping measures as have enabled Germany to advance her shipping interests so rapidly that in the matter of speed, accommodation and size, the ships of its leading companies are probably the best in the world. Germany's success is due, very largely, to the fostering influence of a judicious system of subsidies; and there is a growing conviction that similar means would produce similar results in promoting the shipping interest of the United States.

The scheme which is at present before Congress provides that all American vessels shall receive a bounty of 1½ cents per gross ton for every 100 miles sailed up to 1,500 miles, and an additional 1 cent per gross ton for every 100 nautical miles additional. The building of fast vessels is to be encouraged by granting a subsidy of 1 cent per ton to vessels of from 1,500 to 3,000 tons measurement and 14 to 15 knots speed, and granting $\frac{1}{10}$ of a cent more for attaining a speed of 1 knot greater; while a steamer of 8,000 tons is to receive 2 cents per gross ton if she makes 20 knots an hour, and 2·3 cents per gross ton if she exceeds 21 knots per hour. It is provided that in earning these mileage bounties, a ship must carry at least half her full cargo, while the maximum amount to be paid out for speed premiums to vessels of over 20 knots speed is to be limited to $2,000,000 per year. The bill contemplates the admission to the United States register of vessels built in foreign yards, with the reservation that such vessels shall receive bounty rates only half as great as those paid to American-built vessels. They are also to be subjected to a limitation of ten years as the period for which the subsidies shall continue, whereas in the case of American-built ships, subsidies will be continued for a period of twenty years. Taking it as a whole, we think that if the stimulus of government subsidies is necessary, the provision of the bill as thus briefly epitomized are about the best that can be made.

The day is rapidly approaching when we shall be able to build ships upon the banks of the Delaware and upon the shores of the Chesapeake and San Francisco Bays, as cheaply as they are now built upon the Clyde, the Tyne and the Thames. We can already produce ships' plates and general structural material more cheaply than they can be made in England, indeed, we have already made shipments of the kind to the other side. How far our remarkable advancement in the steel and allied industries is due to government assistance, we do not attempt to say, but the fact is incontrovertible that the industries which have been thus encouraged have had a growth that is absolutely without a parallel. As to the policy of ship bounties, we have yet to find any substantial reason advanced to show why government assistance will not prove as great a stimulus to our shipping interest as it has been to the flourishing industries above mentioned.

THE SINGLE-RAIL SUSPENDED RAILWAY.

The most striking feature of the curious railway which is illustrated elsewhere in this issue, is its novelty, for as far as we know this is the first instance of the construction of a standard elevated railway of the true mono-rail type. The other so-called "mono-rail" systems have required, in addition to the main weight-carrying rail, one or more auxiliary rails for the purpose of steadying the cars and preserving them in the vertical position; while in the Decauville system this duty is performed by laborers or draught animals. Whether this system will prove to be superior to the common type of elevated railway with which we are familiar in this country, has yet to be proved. As far as we can understand the chief advantage claimed is that derailment is practically impossible at high speed. It is said that in the early experiments with the Langen suspended railway, hanging cars of the general type now in use were successfully run around curves of 33 feet radius, at a speed of 15½ miles an hour, with the cars swinging outward on the curves to the extent of 25 degrees from the vertical. This would seem to prove that derailment on the curves of a standard line would be a remote possibility, and, no doubt, the designer has produced a system which will be suitable for lines of excessive curvature over which it is desired to run trains at a high rate of speed. At the same time it is a fact that some of the sharpest curves in the world are to be found on our own elevated railways in New York city, and when we consider the enormous traffic that passes over them, it must be admitted that derailment at these curves is an extremely rare occurrence.

As regards the weight of the cars, it is probable that the suspended type has some advantage over the ordinary car running on two four-wheeled trucks. The concentration of the rolling load upon a single rail should reduce lateral and longitudinal vibration, and tend in every way to smoothness of running. The fear has been expressed that the swaying of the cars would produce uncomfortable symptoms of nausea, intensifying the liability to that "train sickness" to which many passengers are liable when traveling over a crooked road. We think, however, that the fact of the center of gravity of the train being hung so far below the point of support will tend to increase the periods of oscillation so greatly that the lateral sway will be scarcely perceptible, especially if care is taken to eliminate all reverse curves by placing a sufficient length of tangent between them.

In point of appearance and general aesthetic effect it must be admitted that the Langen road, at least as built through the Wupper Valley, is decidedly picturesque, and is less obtrusive, whether in city or country, than the ordinary system of rectangular elevated structures with which we are familiar. Architecturally considered the structure is another tribute to the skill of the German engineers, who have proved in many of their later bridges that most pleasing architectural effects may be obtained without violating the structural or commercial limitations which control, and very properly control, the best modern engineering works.

THE SEVENTH ANNUAL RECEPTION AND EXHIBITION OF THE NEW YORK ACADEMY OF SCIENCES.

BY E. O. HOVEY.

The seventh annual reception of the New York Academy of Sciences, with its accompanying exhibition of specimens, preparations and apparatus to illustrate the progress of science during the past year, was held in one of the new halls of the American Museum of Natural History on April 25 and 26. There were about one hundred and twenty exhibitors and the number of articles exhibited ran up into the thousands, classified under twelve sections or departments.

The section of anthropology, in charge of Prof. Franz Boas, exhibited three cases of objects taken entirely from collections made by the Natural History Museum during the past year, and indicating incidentally, but very graphically, the broad scope of the anthropological investigations now being carried forward by the institution. The material exhibited was brought from Southampton Island in the American Arctic regions, Arizona, California, British Columbia and the banks of the Amoor River in Northeastern Asia. Among the articles exhibited here those which attracted the most attention, perhaps, were a toboggan made by the Eskimo of Southampton Island from the baleen of a whale, and a series of beautifully embroidered garments made from salmon skin by the Golds of the regions along the Amoor River, and collected for the museum by Dr. Laufer of the Jesup North Pacific expedition. The section of astronomy, under the care of Prof. Rees, made its usual fine display of photographs showing the progress made in making negatives and measurements of stars, star-clusters, nebulæ, etc. An interesting photograph was one of a rainbow sent on from Arizona.

The botanical exhibit, in charge of D. T. McDougal, was large and contained much of scientific, or popular interest in more ways than those merely botanical. Prof. Stone showed a set of new apparatus used in measuring the amount of force exerted by a plant in growing and in determining the effect of electricity upon plant growth. A series of remarkable photographs of plants by J. A. Anderson, attracted a measure of the attention it deserved. Some of the subjects were fungi on a tree-stump, cotton bolls, milk weed pods shedding their seed and dandelions gone to seed. The New York Botanical Garden showed, by means of copies of publications, examples of labels, etc., the progress that is being made in that part of Bronx Park, but the most interesting thing in its exhibit from a mechanical point of view, was an exhibition microscope which has been recently devised by Dr. McDougal, and which consists of a simplified microscope inclosed in a small box of plate glass in such a way that visitors cannot throw the instrument out of adjustment, although at the same time the attendant can readily open the case and change the mount on exhibition.

The progress in chemistry the past year seems to have been largely in the line of synthetic work, and a large series of artificial perfumes and artificial indigo, both French and German, gave some hint of the skill being attained in the technical side of the science. On account of the interest excited in smokeless powder, through its extensive use in the South African war, a small exhibit of the explosive was instructive as showing the numerous forms in which it is put up and the widely varying appearance of the finished product. C. E. Pellew had charge of this department.

The electrical exhibit, which was in charge of G. F. Sever, consisted mainly of new and improved Watt volt, and ampere meters exhibited by some of the largest manufacturers of such machinery.

The department of geology and geography, under R. E. Dodge, brought together a considerable exhibit, the geographical features of which consisted of the books and maps issued during the past year by the United States Geological Survey, and the State surveys of New Jersey and Maryland. The geology was represented by some remarkably rich telluride specimens from Cripple Creek, Colorado, quicksilver ores from Southwestern Texas, serpentine verdalite (verde-antique) from Easton, Pa., clays and shales from Michigan and Alabama, complete series of igneous rocks from Magnet Cove, Ark., and the Yellowstone National Park. Mention should not be omitted of a large volcanic bomb, or ejected block, from the island of Vulcano, near Sicily, and of a mass of curiously weathered eolian limestone, from the Bermudas, exhibited by the Geological Department of the Museum.

Alongside this section was that devoted to palæontology, which was in charge of G. van Ingen, and was devoted almost entirely to the collections made by the Department of Vertebrate Palæontology of the American Museum. The explorations of this department in