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COLUMBIAN FAIR PROGRESS.

The managers of the International Exposition to be held in Chicago in 1892-93, after many disagreements as to the site and other particulars, seem now to have come to sufficiently definite conclusions to permit of the actual commencement of work. It is decided that all the main buildings of the fair shall be at Jackson Park on the lake front, near the south end of the city, this park being connected by the Midway Plaisance with South Park, and together forming a large, unobstructed, and already improved site. The attempt to divide the fair, and put a portion of the buildings in the small but beautiful park at Lake Front, near the center of the city, has been definitely abandoned, although the latter park is to be adorned with statuary as a lounging place for tourists.

The plans for the buildings in Jackson Park have been very carefully considered by a commission of architects, which met in Chicago, February 20, and, although all details are not yet finally determined, the main features are fully laid out. Richard M. Hunt, of New York, presented three sketches for the Administration Building; George B. Post, of New York, had sketches for the Liberal Arts Building; C. F. McKim, of New York, for the Agricultural Building; R. S. Peabody, of Boston, for the Machinery Hall; Henry Van Brunt, of Kansas City, for the Electrical Building. Adler & Sullivan, S. S. Beman, W. L. B. Jenney, Henry Ives Cobb, Burling & Whitehouse, the local members of the commission, had designs for the Transportation Building, the Mines and Mining Building, Horticultural Hall, Fish and Fisheries Building, and the grand entrance and triumphal arches. Olmsted & Co., the landscape architects, of Boston, were present with landscape designs, and Augustus St. Gaudens, of New York, advised in reference to decorative statuary. It is said the buildings will surpass any previously seen at former international expositions, and that they will also cost more. It is expected that there will be in all "about two miles of frontage and an average height of sixty feet, in which domes, cupolas and minarets will arise from the groups, while canals will wind about the base of the buildings." Iron, steel, brick and glass will be used, but the materials will be so treated as to give the effect of granitic solidity, a classic style of architecture prevailing, and stone and granite of different colors being imitated with marvelous exactness.

It is estimated by the directory that the expenditures will be \$17,625,453, divided as follows: For construction, \$12,766,890; administration and organization, \$3,308,563; operation, \$1,550,000. On these estimates the work has been commenced, and is to be energetically pushed, now that the location of the buildings has been finally decided upon and the plans virtually approved. The resources, believed to be available as fast as needed, are, from popular subscriptions pledged \$5,000,000, from proceeds on Chicago city bonds, \$5,000,000. In addition to this ten millions, it is believed there will be ultimately realized—from gate receipts, \$7,000,000; from concessions, \$1,000,000; from salvage, \$3,000,000—or a total of \$21,000,000. The members of the directory consider these estimates extremely conservative, and do not believe that there will be any further hitch in the progress of the work, from financial or other considerations.

ANOTHER FARADAY WANTED.

Among the scientific problems that await solution was that described at the recent meeting of the National Electric Light Association by Prof. Elihu Thomson, to wit, a direct method of obtaining electricity from fuel. The present method necessitates the interposition of the steam engine, in which even under favorable conditions scarce more than ten per cent of the theoretical energy of the coal is recovered in mechanical power, this suffering diminution again at the wire end of the dynamo. "It almost seems," said Prof. Thomson, "from all that we who are actively engaged in looking up matters in this connection can say, it almost seems to us that we must wait for some new discovery, for another Faraday to come forward and show us principles which are not now known, some relation between electric energy and heat energy whereby we can convert even 35 to 40 per cent—we will be satisfied with that—of the heat energy into electric energy. Look what it means, should such a thing come about. The steam engine would disappear. The steam locomotive would disappear. The steamship would be propelled no longer by the steam boiler and the burning of fuel under a steam boiler. Fuel would be burned, but burned to produce currents. The apparatus to propel the steamship would not be a steam engine with its reciprocating motions and its racking strain, but would have that quiet rotary motion which characterizes the modern electric motor."

Edison has been working on the problem. If only he could solve it! Davy, after years of unrewarded study and observation, put two wires together tipped with carbon, drew them apart and got the flame which now we call the electric arc. We put together a mechanism which has made the generation of such light commercially practicable. Faraday discovered the

principle which underlies the generation of current by the dynamo, being the first to move armatures in magnetic fields. We have profited greatly also by that. If only now we could repay these free gifts by the discovery of a principle by which the energy of coal could be directly obtained!

INTERESTING NAVAL INFORMATION BY THE SECRETARY OF THE NAVY.

The impression prevails in the popular mind that there has been a falling off in the speed of our new war ships, and that they are incapable of the velocities with which they were credited on their original trial trips. It is claimed they were unduly pushed and strained on those occasions, to benefit the contractors, and neither have nor can ever again attain an equal speed. This impression has been confirmed by the slow performances of several of the vessels since they were accepted by the government.

A representative of the SCIENTIFIC AMERICAN recently had a special interview with the Hon. Benjamin F. Tracy, Secretary of the Navy, respecting the above matters, and at the same time requested his views upon the new fast cruiser No. 12; also upon the proposal to employ fast naval vessels as mail carriers.

Secretary Tracy said: "The statements recently made concerning the cruisers of the new navy, namely, that they have fallen off in speed from the records established on the measured mile, and that they have never since approached in general efficiency and sea-going qualities to the standard set up on the trial trips, are untrue statements and misleading in the extreme. These statements are particularly untrue of the Chicago, the Boston, the Atlanta, and the Yorktown; as will be seen by comparing the speeds registered by these vessels on the trial trips with the speeds they have attained on more recent cruises. It is true, however, that the cruiser Charleston has not maintained the speed of her initial trip, and on her return to San Francisco, where she is assigned as flagship to the Pacific station, I propose to investigate the matter and find out the cause of her apparent deterioration. The reason for the falling off in this case is, I have no doubt, the same as in all former cases where there has been an apparent deterioration in speed—poor coal and foul bottoms. The statement, I say, is not true of the Yorktown, built by Cramp and now attached to the squadron of evolution. At the series of trials held at Newport on August 21, 1889, her performance as regards general sea-going qualities was as good as ever, while the speed she attained on that occasion was even greater than that developed on her trial trip.

"It is not true of the Boston, which has been in commission many years, and is now also one of the squadron of evolution. She can to-day make as good speed as she has ever made. Look at the recorded speeds of the vessels of this squadron under the command of Admiral Walker, in Narragansett Bay, during the autumn of 1889. In this series of trials the Chicago registered a speed of 15.328 knots; the Boston reached a speed of 15.58 knots; the Atlanta recorded a speed of 13.45 knots; while the Yorktown, built by Cramp in 1887, showed an increase of 0.35 knot over the speed of the trial trip. Now, on ordinary occasions, there is no necessity for a quick run, and the cruisers are, accordingly, not put to their best speeds. The initial or contractor's trips show us what the vessel is capable of doing, and this is confirmed by subsequent special trials. If, then, the cruisers do not invariably maintain the maximum speed, it is not because of any inefficiency of the cruiser, but simply because there is no necessity of stretching every nerve, of using forced draught, of striving to reach a speed which we know the vessel has reached, and can at any time reach again, when the occasion calls for it. The conditions that obtain in a ship under forced draught are not conducive to the continued efficiency of the engines or machinery, and it is my opinion that no ship can be put to this great strain for any considerable time without detriment to the vessel as a whole. This maximum speed should be kept as a reserve power, in case of great emergency in warfare, and it should not be constantly exercised.

"It is in accordance with this theory that the vessels of the new navy are not, as a rule, run up to their best records. But I think it can be shown that whenever great speed is a desideratum, the vessels of the new navy are, class for class, equal to and superior to the English vessels in maintaining and retaining their initial speeds.

"The statement that the coal bunkers are of insufficient capacity is an unreasonable one. Every vessel, it has been said, is a compromise. In the designing of a vessel there are many features to be considered, and to a certain extent each must be modified by all the others. And so the speed of a cruiser must be considered in connection with the enduring capacity and with the weight of battery. As we, unlike most European powers, have no intermediate coaling stations, it is particularly essential that the vessels of our navy have a large coal capacity; indeed, in my opinion, speed and coal capacity rather than weight of battery are the important qualities to be sought for in