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D. Leary, of Brooklyn, N. Y. The contract was signed July 1, and Commander Chester was appointed inspector on the part of the Government, Lieut. Richardson Clover, U. S. N., and Passed Assistant Engineer, H. N. Stevenson, U. S. N., being assigned as his assistants.

Lieutenant Clover, who had been associated with Commander Chester in the preparation of the data, from the inception by the late Superintendent of the project of building a vessel especially adapted to the survey of Alaskan waters, was stationed at New York, taking the immediate charge of the work, and under his constant watchfulness nearly ever timber and bolt that went into the construction of the steamer received careful inspection. It is believed that the plan of having the officer upon whom was to rest the responsibility of commanding the vessel in her voyage to the Pacific appointed as the immediate supervisor of her construction, was fraught with good results to the Government, and that he acquitted himself with credit is well known.

Mr. Stevenson was located at Philadelphia, where the steamer's machinery was being made by Messrs. Neafie & Levy. This officer had also been associated with Commander Chester in planning the machinery, and, as her future engineer officer, was deeply interested in the careful construction of the motive power of the vessel.

This arrangement of duties left Commander Chester free to proceed from point to point where he was needed to decide questions of construction, and to see that all workmanship and material were of the best quality and satisfactory to the inspector.

The steamer, named the Carlisle P. Patterson, after the late Superintendent, was launched January 15, 1884, and at the date at which this report closes had made two satisfactory trial trips, and was nearly fitted for her voyage to the Pacific coast.

Charge of the Coast and Geodetic Survey Exhibit at the Southern Exposition, Louisville, Ky.—The Southern Exposition, held at Louisville, Ky., in the summer and autumn of 1883, was, as a whole, principally illustrative of the manufacturing and agricultural interests of the country; but there were many fine commercial exhibits, and the display was national in its character, exhibits being centered there from all parts of the United States, and the following departments or bureaus of the Government being represented in addition to the Coast and Geodetic Survey, viz: The Geological Survey, the Signal Service, the National Museum, the Bureaus of Education and of Engraving and Printing, the Life-Saving Service, the Fish Commission, and the United States Mint at Philadelphia.

Assistant H. W. Blair, having been assigned to the charge of the exhibit made by this Survey left Washington for Louisville in the latter part of July.

In the arrangements for placing the instruments, charts, and other articles illustrating the methods and appliances of the Coast and Geodetic Survey, Mr. Blair expresses his great indebtedness for kindness shown and assistance rendered by Maj. J. M. Wright, the manager of the exposition, and by Prof. J. R. Procter, State geologist, who had general charge of the placing of the Government exhibits.

Mr. Blair remarks that to the general visitor the display made by the Government seemed to be one of the most attractive ones. That of the Coast and Geodetic Survey showed the principal instruments used in its geodetic, astronomical, topographic, hydrographic, and magnetic work, with illustrations of the results of the work by selections from the published charts, collections of the Annual Reports, Coast Pilots, and Tide Tables, and by a model of the basin of the Gulf of Mexico constructed in the office from the results of soundings made between 1876 and 1878. This model attracted special attention; applications for copies of it were made, and it had many visitors from schools and classes of advanced students.

For the exposition management Mr. Blair prepared a concise description of the articles forming the Coast and Geodetic Survey Exhibit, together with a short account of their use. This paper appears as Appendix No. 18.

At the close of the exposition two awards were made to the Survey; one a medal for the exhibit as a whole, and the other a diploma for the line-and-end comparator.

Comparisons of standards of weight and measure, and investigations relating to determinations of gravity.—The special investigations relating to determinations of gravity and to comparisons of standards, carried on in Great Britain and on the continent during the summer of 1883 by Assistant C. S. Peirce have been already referred to in Parts I and II of this report; in the former under the heading "Special Scientific Work," and in the latter under the heading of Section III.

With reference to the ratio of the meter to the yard, to obtain an exact value of which has been one of the objects kept in view during the course of his investigations, Mr. Peirce makes the following statement:

"The ratio of the meter to the yard is still a matter of considerable uncertainty. Kater's value of the meter, 39.3707 inches is universally regarded as too long. Clarke's, 39.3704 inches, though undoubtedly more nearly correct, is not founded upon an examination of sufficiently good meters. The value given by Prof. W. A. Rogers, 39.37027 inches, is probably the most correct, but may be in error by one or two ten thousands of an inch. The main difficulties of the determination are four:

"1. To obtain a length known to be equal to a meter.

"2. To compare quantities practically incommensurable.

"3. To compare two bars, one of which is standard at the freezing point while the other is standard at 62° F.

"4. To compare a line-measure with an end-measure."

"As the amount in doubt is large as compared with the best measures of the length of the second's pendulum, we may obtain a value of the meter not unworthy of consideration by comparing the value of the seconds' pendulum at Kew as determined by Captain Heavyside in inches with the same value as determined in terms of the meter by myself. This gives for the meter 39.3700 inches. In order to obtain a better comparison, two reversible pendulums, made on the same pattern, one measuring a yard and the other a meter between the knife-edges, were swung simultaneously, each near its standard temperature at the Coast Survey Office. The pendulums were also interchanged so as to determine at the same time their coefficients of expansion.

Assuming that by this method a meter and a yard bar can be made which shall bear to each other a relation capable of the most accurate determination, it will still be important to devise a method by which a check can be kept upon the changes in length to which all bars are liable by molecular action. Mr. Peirce has accordingly devoted much attention to the spectrum meter—a meter constructed so as to be readily compared with the length of a wave of light.

Attendance of a delegate on the part of the Coast and Geodetic Survey at the International Geodetic Conference at Rome.—Shortly before the time fixed for the seventh annual conference of the International Geodesic Association at Rome, I received from General Ibanez, of Spain, the president of the conference, a letter expressing his urgent hope that American science would be represented at Rome by a delegate from the United States. In view of the international importance of fixing upon a meridian which should be employed as a common zero of longitude and standard of time reckoning, and of the great desirability of having the opinions of men of science in the United States brought before the conference during its discussions of these subjects, I took the earliest opportunity to obtain from the Department its sanction to the appointment of Mr. R. D. Cutts, Assistant in charge of the office, as a delegate to the conference.

But short notice having been given, Mr. Cutts was able to reach Rome only on the morning of October 15, the first day of the session. Reference has been made in a preceding part of this report to the part taken by him in its deliberations, and to the resolutions which were finally adopted as embodying the conclusions of the conference.

The subsequent action of this Government upon the final resolution recommending an International Convention to be held at Washington, as proposed by the United States and advocated by its delegate, is well known.

Transportation of valuable standards of weight and measure from England to France.—Occasion having arisen for the transportation under responsible personal supervision of two important standards of weight and measure from the British Standards Office in London to the International Bureau of Weights and Measures at Breteuil, near Paris, advantage was taken of a contemplated visit to Europe of Dr. Thomas Craig, of the Johns Hopkins University, who had kindly offered to be of service to the Survey. Dr. Craig's former connection with the work has sufficed to keep up his strong interest in it.

Upon his arrival in London, early in June, he went to the Standards Office and there received the standard yard (Low-moor iron No. 57), and standard Arago platinum kilogram and transported