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PROCEEDINGS

VOLUME I.

DECEMBER, 1884.

OF THE

The meeting was called to order by P. M. President bar-

The Treasurer presented the following

American Metrological Society,

ORGANIZED, DEC. 30, 1873.

FROM MAY, 1884, TO DECEMBER, 1885.

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1885.

MEETING OF THE SOCIETY,
COLUMBIA COLLEGE, New York City,

December 30, 1884.

The meeting was called to order at 3 P. M., President Barnard in the chair.

The Treasurer presented his report as follows:

TREASURER'S ACCOUNT TO DEC. 30, 1884.

By Receipts for Dues (May to Dec.),	-	-	-	95 00
" Donation from F. A. P. Barnard,	-	-	-	100 00
" Balance last acc't, May, 1884,	-	-	-	647 50
				<u>\$842 50</u>
To Gregory Bro's, Printing,	-	-	550 00	
" Clerical services and stamps,	-	-	82 80	
" Sundries,	-	-	17 60	650 40
				<u>\$192 10</u>
Balance on hand,	-	-	-	

BILLS PAYABLE.

Due the printer on Proceedings,	-	-	150 00	
" on Index (estimated),	-	-	78 86	228 86
				<u>\$36 76</u>
Prospective deficit,	-	-	-	

J. K. REES, Treasurer.

The Report was referred to Messrs. Allen and Colin as auditing committee.

The committee reported the accounts correct, and the report of the Treasurer was accepted.

Hon. Horatio Burchard, Director of the Mint, was nominated for membership by Mr. Elliott and was elected.

Mr. Colin remarked that the expression "Prime Meridian," is the most appropriate in the English language, but the word "prime," having several meanings, the French, Italians and Spaniards do not always translate it properly. To say in French "Premier Meridian," is a misnomer, although it is the first to be considered; it is in fact the *meridian zero*, and not the *first*; the word "initial" in these languages, removes all ambiguity, and unless a much needed technical expression be coined, it will ultimately be retained.

Prof. C. S. Peirce then gave a very interesting and detailed description of the pendulum experiments now being carried on by him, to determine the force of gravity at different points in the United States and elsewhere.*

Prof. Mayer remarked that 62° F. was the best standard temperature, much better than 0° C., because we do not yet know accurately the law of expansion by heat. There may be increase in length without change in volume. For terminal surfaces of the standards of length, he thought steel better than agate or any other non-conducting material, as heat raises a welt on a non-conducting surface, and cold caused a depression, and this is owing to the heat not being conducted from the agate, &c., surface.

In answer to Mr. Elliott, Mr. Peirce said that he thought both Clarke's and Rogers' meters were too long.

By request of the President, Mr. Peirce gave an account of his measures on the old Newport Mill or Tower. He said his measures pointed to the use of the old Norse foot.

Prof. Peirce inquired of Mr. Burchard whether or not any allowance was made for the different buoyancy of brass (relative to gold) at the mints in Carson and Denver, and those nearer the sea-level.

Mr. Burchard said they used the weights furnished by the Office of Weights and Measures without correction.

* This paper is not ready for printing in the Proceedings.

1884.]

On Weights and Measures.

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Mr. Peirce explained that he was in charge of the office of Weights and Measures, under the Superintendent of the Coast Survey. He stated that the condition of our pound weights was somewhat confusing. At the Declaration of American Independence, the legal standards were those of Queen Elizabeth. No relation was fixed by law between the Troy pound and the avoirdupois pound, although no doubt it was understood that their ratio was at $5760 \div 7000$. But the actual avoirdupois standard of Elizabeth is believed to have originally weighed 7002 grains, while in 1758 it was found to weigh 7000½ grains. During the presidency of J. Q. Adams, Congress declared by law that a certain pound, now in the mint in Philadelphia, should be the Troy pound of the United States. This then is the Troy pound to-day, irrespective of English standards. However, this law did not alter the avoirdupois pound, which therefore remains as it was before. But unfortunately, we do not know, precisely, what either of those weights are.

The Elizabethan standards were used in England till 1824. They were then replaced by the new Imperial Pound, which does not profess to be a copy of the old avoirdupois pound, but to be 11% of the old Troy pound; that is of what the old pound did weigh in vacuo. This Imperial pound has no authority in this country, except what it may derive from the belief that it is equal to the old avoirdupois pound. Nevertheless, all avoirdupois weights are adjusted to this in the Office of Weights and Measures.

We are equally in the dark in regard to the Troy pound. The pound of the Philadelphia Mint is hollow, and its specific gravity and consequently its exact mass, are unknown. What is certain is that the Troy weights issued by the Office of Weights and Measures, do not bear the exact relation to the avoirdupois weights which is legal in England. Mr. Peirce said that such a state of confusion was sufficient, of itself, to prevent the use of the English system in scientific work.

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On Weights and Measures.

[Dec.,

Prof. Mayer then made some remarks on his investigations with vibrations of tuning forks.

Mr. Allen said that the proceedings of the International Meridian Conference had not yet been published for general distribution, but he presumed they would be so printed. In alluding to the recommendations of the Conference (note elsewhere), Mr. Allen stated that the majority of the members of the Conference appeared to favor reckoning longitude up to 360° . There appeared to be irreconcilable differences of opinion as to the direction of the count and it was therefore thought best not to interfere with the present method of reckoning, which was consequently re-affirmed.

Mr. Elliott moved that a vote of thanks be given by the Society to Dr. Pierce, for the interesting information he had given, and it was unanimously carried.

The following resolution was unanimously passed:

Resolved, that a Committee be appointed to address the Secretary of the Treasury, and to memorialize Congress, upon the need of establishing an efficient bureau of weights, measures and physical units.

The officers elected last year were continued in office for the ensuing year.

On motion the Society adjourned.

J. K. REES,

Secretary.

[May,

1885.]

The Secretary called the attention of the Committee to Memorialize Congress to the resolution passed at last meeting on the suggestion of Prof. C. S. Peirce, of the Coast Survey.

Resolved, That a committee be appointed to address the Secretary of the Treasury, and to memorialize Congress upon the need of establishing an efficient Bureau of Weights, Measures, and Physical Units.

The Secretary was requested to call the attention of the President to the matter.

Mr. Elliott, for the Committee on Variation of Measures, said that the subject had been under consideration, and it was intended to continue the same field of investigation upon which they had already reported. The Committee made an elaborate report some time ago on the measures of capacity of the various States.

The Secretary reported that the fourth volume of the Proceedings had been issued and distributed to the members of the Society, the members of Congress and the foreign societies, and to all the State Governments of this country.

He reported also, that the Publication Committee had prepared an index to all the publications of the Society. This is the first index to the Proceedings ever prepared. It gives the principal subjects referred to in the Proceedings from the beginning of the first volume, and has been sent to all the members of the Society. There are some errors and misprints in it, but they are not of a character that would cause any serious trouble in using it for reference, and it will certainly make the Proceedings far more useful. In the future each volume will have its own complete table of contents.

Mr. Elliott said, I deem it very desirable that this Society should, at an early date, through its proper officers, communicate with the Administration with regard to these various points.

International action, with regard to the introduction of the metric system, with regard to coinage, and especially with regard to the relations of silver, is desirable. My views are based on a late consultation with the Treasury authorities. The adoption of the metric system for the Customs offices, the adoption of the existing