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ART. VI.—*Note on the Progress of Experiments for comparing a Wave-length with a Meter*; by C. S. PEIRCE. Communicated by the Superintendent of the U. S. Coast and Geodetic Survey.

To C. P. PATTERSON, Superintendent U. S. Coast and Geodetic Survey:—

DEAR SIR—The following is the present state of the spectrum meter business. The deviation of a spectral line (Van der Willigen's No. 16) has had three complete measures using a certain gitter of $340\frac{1}{2}$ lines to the millimeter. The double deviation (the angle measured) was found to be

1877. June 23,	89° 54' 19".5
June 29 and July 2,	19.25
Sep. 4 and Aug. 27,	19.65
Mean,	89° 54' 19".3

An error of 0.4" in this would occasion an error of one micron in the meter. These measures were previously communicated to you, but owing to an erroneous value of the coefficient of expansion of glass having been used (the value for iron having been inadvertently substituted) they did not seem to agree as well as they do. There were two other complete measures, but in regard to one of them there is a doubt about the thermometer used, and in regard to the other there is a doubt about the part of the line set on. This line seems on the whole to be a bad one for the purpose. Another line near it was therefore selected and another much finer gitter. The deviations obtained were on the different days:

1879. May 8,	90° 03' 51".7	May 15,	90° 03' 50.35
May 9,	51.75	May 21,	51.75
May 10,	52.0	May 22,	51.2
Mean,	90° 03' 51".45		

Notwithstanding the bad result of May 15, which is unaccountable, these measures are evidently good enough. One of these gitters has been compared with all the centimeters of a decimeter scale of centimeters. The other is still to be compared with all the even two centimeters of the same scale.

Mr. Chapman is now comparing this decimeter scale with all the decimeters of a meter scale of decimeters. As soon as that is done a meter will have been compared with a wave-length. But shortly after, this will be improved by comparing the other gitter and also a third upon which I propose to measure a deviation. It will remain, first, to find the coefficient of expansion of the glass meter. The apparatus is all ready for this and it will not take a fortnight. Second, the glass meter will have to be compared with a brass meter. This will be an operation of some difficulty but I think we shall complete it before long.

Yours respectfully, C. S. PEIRCE, Assistant.