ART. XXXVI.—*Results of Pendulum Experiments;* by C. S. PEIRCE, Assistant Coast and Geodetic Survey. [Published by authority of C. P. Patterson, Superintendent.]

THE following are the results obtained from observations made by me, for the U. S. Coast and Geodetic Survey, at four important stations, for the purpose of comparing the lengths of the seconds pendulum, together with reductions to the sea-level and to the equator. In making the last reduction I have assumed the ellipticity to be $=1:293$, which is the latest result from measurements of arcs.

|  | At station. | At sea-level. | At equator. |
|---|---|---|---|
| Hoboken | $0 \cdot 9932052^m$ | $0 \cdot 9932074^m$ | $0 \cdot 9910003^m$ |
| Paris | $0 \cdot 9939337$ | $0 \cdot 9939500$ | $0 \cdot 9910132$ |
| Berlin | $0 \cdot 9942399$ | $0 \cdot 9942482$ | $0.9909865$ |
| Kew | $0 \cdot 9941776$ | $0 \cdot 9941790$ | $0 \cdot 9910083$ |

The differences of the figures in the last column from $0 \cdot 991^m$, a value conveniently near their mean, when reduced to oscillations per diem are: Hoboken $+0 \cdot 01^s$; Paris $+0 \cdot 58^s$; Berlin $-0 \cdot 59^s$; Kew $+0 \cdot 36^s$. The following are the residuals of former observations according to Clarke (Geodesy, p. 349).

New York $+0 \cdot 20^s$; Paris $-3 \cdot 29^s$; Kew $+2 \cdot 89^s$.

Colonel Clarke has used a value of the ellipticity $=1:292 \cdot 2$ derived from pendulum experiments. This slight difference, however, is not important.

It should be explained that the result for Hoboken is derived from [$T^2$ Inv.] "Regular Set," given on page 318, and also on page 416 of the Report of the Superintendent of the U. S. Coast and Geodetic Survey for 1876. This number is treated as explained on page 319, where in the second line from the bottom for [$T^2$ Rev.] read [$T^2$ Inv.] The altitude of the Hoboken station is stated on page 204. The numbers for the European stations are copied from page 320.

The length which I have taken as the meter has been derived from the German Eichungsamt, as fully explained in my report. This is about $19 \cdot 2$ microns shorter than the quantity which is considered to be a meter in our own office of weights and measures, and is admitted in Berlin to be doubtful. It is impossible to fix the true meter at present; but I have but little doubt the above values will ultimately have to be diminished by about twenty microns on account of the error in the standard used.