and the amount of the declination at that time are easily derived from above formula. D will have a minimum value, for example, when

$$\sin (1°.4\, m - 22°.3) = -1\,, \qquad (2)$$

that is when $1°.4m - 22°.3 = -90°$,

or $$m = (t - 1850) = -\frac{67.7}{1.4} = 48.4\,.$$

Hence $t = 1801.6$,

and $D = 3°.38 - 2.72 = 0°.66$ W.

The minimum westerly declination of 40′ W. was, consequently, reached at Baltimore in about 1802.

The formula will also enable us to obtain the amount of annual change at any time between 1640 and present date. The expression to be used for this purpose can readily be obtained by differentiation of the original formula. If a is the amount of annual change, expressed in minutes,

$$a = 60 \sin 1° \times 2.72 \times 1.4 \cos (1°.4m - 22°.3)$$
$$= 3'.99 \cos (1.4m - 22.3)\,. \qquad (3)$$

We see in the first place that if the quantity in parenthesis is equal to 90°, then the value of a is zero. Since we found $(1.4m - 22.3)$ was equal to —90° in 1801-6, it follows that at the time of minimum declination the annual change vanished. Again, a will have its maximum value of 4′ nearly when

$$1.4m - 22.3 = 0\,,$$

or when $$m = t - 1850 = \frac{22.3}{1.4} = 16\,,$$

that is in 1866.

The figures as obtained in this way will be close approximations to the real facts.

Similar collections to those at Baltimore at stations in the adjoining states have been made by the Coast and Geodetic Survey. As the reports of the Survey can be readily obtained, it would be useless to reproduce here these collections. Simply so much can be given in each case as will make it unnecessary for any one who wishes to make a practical application of the data to refer to the original source. The student of terrestrial magnetism who wishes to refer to the original observations may consult Appendix 1, Coast and Geodetic Survey Report for 1895. All the data that could be of possible ser-