3. *South-north motion.*† Suppose a body has moved from P to Q (fig. 2) the time t which is supposed to be so small that the velocity of the body may be assumed as constant during the interval. Since the body has the eastward velocity $\omega r \cos \varphi$ at P and $\omega r \cos \varphi'$ at Q the eastward displacement of the body at the end of the time t is $\omega r (\cos \varphi - \cos \varphi')t$ which we shall denote by s. Let the velocity of the body along the meridian be v, then $PQ = vt = r(\varphi' - \varphi) \div \frac{vt}{\varphi' - \varphi}$

$$s = \omega r (\cos \varphi - \cos \varphi') t = \frac{\omega v t^2}{\varphi' - \varphi} (\cos \varphi - \cos \varphi')$$

$$= \frac{\omega v t^2}{\varphi' - \varphi} \left(2 \sin \frac{\varphi' - \varphi}{2} \sin \frac{\varphi + \varphi'}{2} \right)$$

$$= \frac{\omega v t^2}{\varphi' - \varphi} \times 2 \frac{\varphi' - \varphi}{2} \sin \varphi = \omega v t^2 \sin \varphi.$$

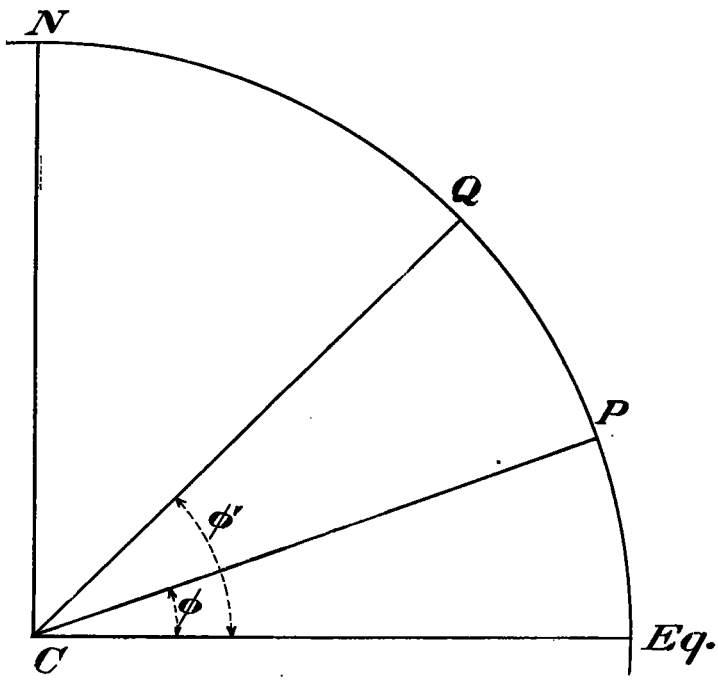

Fig. 2.—Section along earth's axis, thru part of Northern Hemisphere, showing cause of deflection of a body moving northward or southward.

Considering that this eastward displacement is caused by the so-called "deflecting force due to the earth's rotation" we have

$$s = \tfrac{1}{2} a t^2,$$

where a denotes the acceleration of the force.

$$\therefore f = m \frac{2s}{t^2} = 2 m \omega v \sin \varphi,$$

which is the same as in the case of the west-east motion. Hence, whenever a body moves in any direction on the earth's surface, there is a force ($2 m \omega v \sin \varphi$) arising from the earth's rotation which tends to deflect the body to the right in the Northern Hemisphere, and to the left in the Southern.

† The idea involved in this method is due to Dr. P. Schreiber, but it is more generalized in the present note. See his excellent treatise "Studien über Luftbewegungen." Leipzig, 1898.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

C. FITZHUGH TALMAN, Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them. Anonymous publications are indicated by a ——.

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C. FITZHUGH TALMAN, Librarian.

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