

states that at Sydney what have been previously termed earthquake waves are in most cases due to atmospheric disturbances in some yet ill-defined manner, and have a marked twenty-six minute time interval from crest to crest.

Finally, these undulations are universal to a greater or less extent, as has been proved by a personal study of tidal records obtained from all parts of the world.

CHIEF POINTS DEDUCED.

1. That the undulations are due to the direct action of atmospheric waves upon the surface of the water at stations, and not to ground swells due to distant storms or "seiche" movements, as found upon lakes during atmospheric disturbances.

2. There is a marked relative correspondence in amplitude between the barometric and water undulations.

3. That they often appear during fine settled weather, when the barometer is high over the station but decidedly low to the south-west, frequently when over 1,000 miles distant.

4. That they increase in amplitude as the storm advances, the maximum usually occurring shortly before and at the time of the shift of wind, which also corresponds with the time of heaviest precipitation. This tends to prove that the axis of rotation of important storms is inclined towards the direction of its future course.

5. That after the storm has passed the station, these undulations rapidly diminish, although a heavy westerly gale may still be blowing, provided the temperature to the westward is fairly uniform: should a cold or warm wave be approaching marked undulations appear.

6. Should a south-west storm move with diminishing energy towards the station the undulations correspondingly decrease as it approaches.

7. That the tidal records are most disturbed during winter and least in summer, due to the velocity of the primary poleward current being almost double in winter what it is during the summer months.

8. The disturbed traces during the summer months chiefly occur shortly before or at the time of showers or thunderstorms, and usually precede warm and cool waves.

9. Whereas many of our storms are whirling eddies, developing from above downwards, it is hoped a further study of these undulations may throw much light upon their future growth and course, even before the ordinary barometer begins to fall.

10. Meteorologists throughout the scientific world now realize that for the further advancement of weather forecasting a better knowledge of the upper atmosphere must be obtained. Rapid strides are now being made in this direction by means of kites, balloons and cloud observations. May we not add the study of atmospheric and water waves at the bottom of this aerial ocean, which can be carried on during all conditions of weather by means of sensitive self-recording instruments?*

The various traces, termed "hydro-aerographs," obtained from such instruments, when more fully understood, will indicate to us certain wonderful forces at work far above, not visually discernible either through the dense lower clouds of an approaching storm or the clear blue sky of a fine winter's day. Also we trust that in the near future the installation of such instruments will become universal, and that Canada will lead in such an undertaking.

*Fully described in a paper read before the Toronto meeting of the British Association in August, 1897.