

4

A tide of this character is apt to be termed irregular by the mariner, as the tropical or declination-month, which is its governing period, is less familiar and less noticeable than the synodic month of the moon's phases. It is evident, however, that this tide is perfectly astronomical, and its analysis and prediction are just as definite as for any other type of tide.

Mean Sea Level.—With a tide of this type, there is a notable difference between the half-tide level, and the true value of Mean Sea level. Its only accurate value is the mean ordinate found by the integration of the tide curve, referred to any invariable base line or datum. This mean ordinate fixes the position of the horizontal line which bisects the area of the tide curve; and this also accords with the best definition of Mean Sea level for any type of tide. We have occasion, later on, to point out the importance of adhering to this definition, as the half-tide level may differ a foot from true Mean Sea level, even in the case of a tide whose extreme range is only thirteen feet.

The advantage of a registering tide gauge is much emphasised with tides of this character. If scale readings are taken by direct observation, which the Admiralty surveyors usually prefer, they must be continuous, day and night, and afterwards plotted as a curve, or little use can be made of them except for the reduction of soundings. With a registering gauge this elaborate and expensive method can be dispensed with. The hourly ordinates of the tide curve throughout the year enable the true value of Mean Sea level to be readily found; and even with a shorter period, the continuity of the record enables the diurnal inequality to be followed, and if this is known the average level and the extremes of high and low water and other data can be correctly determined. The continuous record is equally important with respect to the time of the tide, in which there is a similar inequality of interval; but with this we are not now dealing.

The question of Mean Sea level is of unusual interest on the Pacific coast, as there is reason to believe that its elevation is changing. Some indications point to a rise in the level of the coast, at as high a rate as one or two feet per century. It is only from tidal observations properly reduced, that any trustworthy result can be arrived at; and if the change is as rapid as supposed, it will not require an interval of many years to obtain a fair approximation to its amount.

DATUM PLANES AT VICTORIA.

At Victoria and Esquimalt, the planes of reference were found to be in great confusion, no less than eight datum planes existing.