

other local circumstances, will profoundly modify the regularity of the great tidal march.

Moreover, the moon is not the only celestial body which acts upon the waters of the sea. We have already said that the sun has a share in this phenomenon, although it is only 38-hundredths of that of our lunar satellite, on account of its vast and almost inconceivable distance from our earth. The inequality existing between the solar and lunar days (the latter are fifty-four minutes longer than the former) results from the joint or alternately contradictory action of the two others. When the sun and moon are in *conjunction*, or

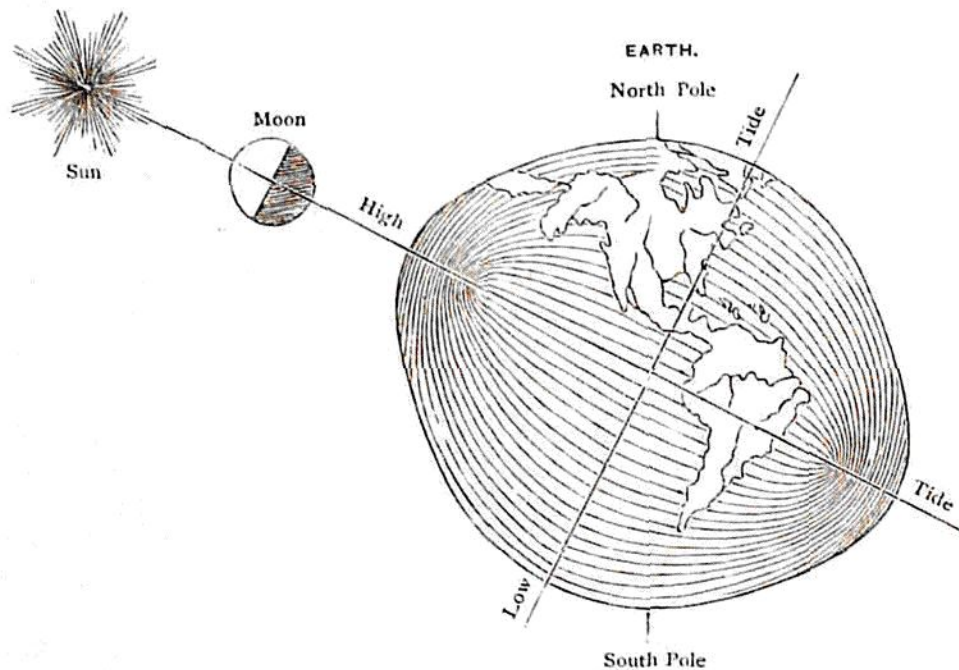


FIG. 217.—LUNI-SOLAR TIDE.

in opposition—that is, situated on the same straight line—their attraction upon the sea combines, and produces a very strong tide; this occurs at the epochs of the *syzigies* (the new and full moon). At the epochs of the *quadratures* (the first and last quarter) the solar action tends to produce a low tide wherever the moon wishes to raise the waters, and reciprocally: the result, accordingly, is a lunar tide perceptibly weakened.

All these effects are not instantaneously obtained, but the impulsion given continues to act, and is not fully spent for one or two