

1777.
July.

I can assign no reason why the variation is so much less at, and near, Annamooka, than at either of the other two places. I can only say, that there is no fault in the observations; and that the variation ought to be more at Annamooka than the above, as it has been found to be so to the Northward, Southward, Eastward, and Westward of it. But disagreements in the variation, greater than this, even in the same needle, have been often observed. And I should not have taken notice of this instance, but from a belief that the cause, whatever it is, exists in the place, and not in the needles; for Mr. Bayly found the same, or rather more difference.

The tides are more considerable at these islands, than at any other of my discoveries in this ocean, that lie within the tropics. At Annamooka it is high water, on the full and change days, nearly at six o'clock; and the tide rises and falls there, upon a perpendicular, about six feet. In the harbour of Tongataboo, it is high water, on the full and change days, at fifty minutes past six. The tide rises and falls, on those days, four feet nine inches; and three feet six inches at the Quadratures. In the channels between the islands, which lie in this harbour, it flows near tide and half tide; that is, the flood continues to run up near three hours, after it is high water by the shore; and the ebb continues to run down, after it is flood by the shore. It is only in these channels, and in a few other places near the shores, that the motion of the water or tide is perceivable; so that I can only guess at the quarter from which the flood comes. In the road of Annamooka, it sets West South West, and the ebb the contrary; but it falls into the harbour of Tongataboo from the North West,
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