

Dear editor

For aficionados of historical minutiae, Larry Pynn's otherwise excellent articles on Captain Vancouver contain a serious error. Vancouver did not determine longitude by using a chronometer. He did it by observing the position of the moon. Because this is difficult to do accurately, he made many observations and averaged the results. It probably took about twenty minutes to process just one set of observations in a cramped, dimly lit cabin, yet, at Observatory Inlet, he made 367 sets of lunar observations.

It is common to imagine that the older navigational methods fell into disuse the moment a sea-going chronometer was invented. Vancouver's technique was developed by Captain Cook and William Wales and used a chronometer to determine small differences in longitudes. The ability to "reduce" celestial determinations to a common place using these small differences allowed navigators to amass many more assessments of the longitude of the common place, and by averaging reduce its error. The two methods thus played complementary roles and not either-or ones.

An adjunct to this is that Vancouver did keep records of longitudes determined by the chronometers. The recording of this data however was very sloppy and his arithmetic is full of errors. Vancouver was evidently not interested in any method other than the tried-and-tested one used by Cook. Vancouver would undoubtedly be dismayed to learn that his charted coastline, although accurate in detail, is about twenty kilometres too far east. This was a result of errors in his Nautical Almanac, not because of his lack of skill or effort.

Sincerely

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[This is an earlier version sent to Vancouver Sun journalist Larry Pynn on June 26, 2007]

Dear Larry

Your otherwise excellent articles on navigation in Vancouver's time contain what to us aficionados of historical minutiae is a "serious" error.

It has become part of modern mythology that the older methods of celestial navigational were replaced in one fell swoop by the development of a sea-going chronometer by John Harrison. The two methods are popularly characterized in a "hero-villain" setting with the Reverend Nevil Maskelyne and the Board of Longitude playing the bad guys. This is simply not what happened. Contrary to the assertion in some of your articles, Captain Vancouver did not determine his longitudes using a chronometer. He did it by painstakingly taking many hundreds of observations of the position of the moon, a method known as the lunar distance method.

His technique was the same as that developed by Cook and William Wales in earlier voyages. The innovation that Cook and Wales introduced was the use of a chronometer to determine the difference in longitudes between points relatively close together. The fact that

the chronometer could not keep good time over long periods, certainly not over the years of Vancouver's voyage, then didn't matter. With the ability to "reduce" celestial determinations of longitude to a common place by using the chronometer measurements of small differences, the navigators were able to amass many more assessments of the longitude of the common place, and by averaging reduce its error.

At one point in the voyage, Vancouver used this technique to amass over a thousand independent determinations of longitude from the position of the moon. The chronometer and celestial methods thus played a complementary role, and not an either-or one. An interesting adjunct is that Vancouver did keep a record of what his longitude would have been had he been relying on Harrison's machine. A study of these records has shown that Vancouver was remarkably sloppy about his recording of the data. This suggests to me that Vancouver personally had complete faith in the methods used by Cook and was not enamored of the new technique. He certainly was not about to change it, even had his instructions from the Admiralty permitted him to do so, which they did not. Vancouver went to sea at a young age and he was a practical man and, unlike Alcalá Galiano, he was not a student of navigational theory. It was for this reason that Vancouver ignored Galiano's warning that the lunar distance method was prone to error because of errors in the tables in the Nautical Almanac.

The research behind these ideas was published in the *Journal of Navigation* in 1995 and in the *Journal of the Canadian Hydrographic Association* in 1994.

Sincerely

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