1 The rutter of 1611

In the name of the Holy Trinity and Jesus María Joseph, we began our voyage from the Port of Acapulco, [on the capitana] General Don Fernando de Silva and on the almirante Capitán Juan de Balmaseda and we set sail Thursday 24 March in the year 1611 at $10\frac{1}{2}$ o’clock in the morning. The Port of Acapulco is in [latitude] $17^\circ0/0$. 

We left steering south. 
25, 26, 27, 28 to the south-south-east and south-east at other times more or less with light wind. We went on the way south-south-west a quarter point more to the south-west.

On 27 I marked the needle at sunset and it set in $2^\circ40'$ from the west to the north (the instrument was well set). The amplitude conformed with the tables Your Majesty sent me to make the observations $2^\circ53'[']$ and the difference $13'[']$. I judged this on the alguja fixa [In l. margin: Fixa] there being very little difference the sword caused by the iron to this instrument.\footnote{Technically, any variation due to such effects as metal on the ship is called ‘magnetic deviation’, see also the Glossary.} 28 we got to $14^\circ$.

We had calm.

29 We had calm. We went very little to the south-south-west.

30 and 31, with reasonable wind to the south-west, a quarter to the west.

APRIL

On 1, 2, 3 [April] to the east\footnote{Ríos writes $4^a$ to mean a quarter of a compass point or $11\frac{1}{4}^\circ$.} we went to the southeast to a latitude of $11^\circ1\frac{1}{2}$.
I took the variation of the compass in the morning which was the Easter Day. The sun had an amplitude of $5^\circ 15$ and it set in $3^\circ$ of east to the north. It northwested $2^\circ 15$. The ordinary compass [In r. margin: Norw[ested] 2[°]15[‘]] compared with that [of Fonseca], and lie there in a line northwested $2^\circ$ with respect to that, so that it northwested with respect to the pole[star] $4^\circ 15$ minutes.

Today we used the *Punto de Esquadría* [method] and we had gained the meridian of the port of La Navidad 150 leagues from Acapulco because there had always been fair winds with which we had been sailing.\(^3\) Until 4 April we steered on the rhumb of southwest [crossed out] northwest until midday on 5 [April] 25 leagues.

Today I came to mark the compasses, the *Fixa* showed [In r. margin: of Fonseca] at sunrise $3^\circ 1\frac{1}{2}$ to the north, it had an amplitude of $6^\circ 2\frac{1}{2}$. It northwested 3° and the ordinary [In r. margin: Nor[thwested] 3[°] 5\°30[‘]} because the sun arose by it 1° to the north.

On 6 to the west a quarter point to the northwest and to the westnorthwest 25 leagues.

On 7 on the same rhumb of westnorthwest — 16 leagues.

[. 86v]

On 8 to the westnorthwest [On 9, crossed out] 30 leagues.

On 9 on the same rhumb — 25 leagues. Today, in the morning, I observed the compass. It showed northwesting $5^\circ 12[‘]$. [In l. margin: Nor[thewested]. $5^\circ 12’$] During all these days we were making way west, and west a quarter point to the northwest. Although we had been steering at times more to the westnorthwest because the compasses with which they were steering went half a quarter[point] with respect to the northeast which is a significant error since that half quarter, with another [In I. margin: note about the compass] half or more which they northwested in those places, it happened that the compass in the binnacle northwested a quarter [point].

On 10 we made our way west a quarter point to the northwest so that for the said cause we made way west —— 36 leagues.

On 11 making way west —— 30 leagues.

On 12 on the same —— 30 leagues.

Today I marked the compass and the sun rose one degree to the north, it had an amplitude in altitude [In l. margin: Nor[wested] $8^\circ 23’$ // de Fonseca] of $11^\circ 1\frac{1}{2}$ nine degrees $23’$ so that the aguja fixa northwested $8^\circ 23[‘]$

The ordinary compass varied less than $3^\circ$. Since for lack of seeing the sun these previous days I do not know the arrival those days always comparing the compass which had varied regularly having been magnetized anew in Acapulco and always being in the same [f. 87r] line in the instrument with the *Fixa* which made no difference

On 13 on the same —— 45 leagues.

\(^3\)The significance here of the use of the Esquadría method, which was used to find the latitude from the speed and compass bearing, was that to sail to La Navidad was now a simple matter of setting course due east.
On 14 on the same —— 35 leagues.
On 15 on the same —— 35 leagues.
On 16 on the same —— 35 leagues.
On 17 to the west a quarter point from the northwest —— 25 leagues.
On 18 on the same rhumb we were in high seas =

This day in March I marked the compass with little certainty and we got to a latitude of 10° 1/2. The day before when it was taken the sun rose by the instrument in 3° from the east to the north. It had [In r. margin: Nor[thwested] 8°2[′]]. in amplitude 11°2′. Then it northwested 8°2[′].

On 19 to the westnorthwest we made way in a quarter point from west going —— 40 leagues.
On 20. to the same[crossed out] west —— 40 leagues.

Today I went to mark the compass and the sun rose in 3° to the north. 4
It had amplitude 12°43[′] which gave northwesting 9°43[′]. the compass that had varied regularly was with this in one and the [In r. margin: Nor[thwested] 9°43[′].] same line. The ordinary compass was also on the same line.

On 21 on the same rhumb ————– 40 leagues.
On 22 on the same ——— 40 leagues.
On 23 on the same ———— 30 leagues.
On 24 on the same ———— 36 leagues.
On 25 on the same ———— 40 leagues.

Today I marked the compass which so far I had not been able to mark because of the clouds. [f.87v] The sun rose by the instrument in 10° from the east to the north in an altitude of 11°. It had [In l. margin: Nor[theasted] 3°35[′].] amplitude 13°35[′]. northwested 3°35.

On 26 to the west a quarter point. to the northwest —— 36 leagues.

Today the sun set at 15° from the west to the north. We went to latitude 12°. The sun was in 6°20′. 8 [Taurus] with amplitude 14°30[′]. The variation half a degree. [In l. margin: Fixa]

On 27 to the west a quarter point to the northwest. 40 leagues.
On 28 to the west ——— 30 leagues.

Today the sun set at 13° from the west to the north in an altitude of 12°. It had amplitude 14°38. later [In l. margin: Nor[theasted] 1°58[′].] it northeasted 1°58[′], and the ordinary ones 7°.

On 29 of April ———— 30 leagues.
On 30 on the same rhumb —— 30 leagues.

Today the sun set at 12°to the north. It had amplitude 15°15′. Then it northeasted 3° 1/4 [In l. margin: Nor[theasted]3°1/4.]

May
On 1. On the same rhumb —— 36 leagues.

The sun rose today in 19° from the east to the north. It had [In l. margin: Nor[theasted] 3°26.] amplitude 15°34[′]. Then it northeasted 3°26[′].

On 2 on the same rhumb ———— 36 leagues.
On 3 on the same rhumb ———— 45 leagues.

4Ceballos-Escalera Gila 1999 has ‘30g°s de [T]’, where he has transcribed ‘T’ as .V..
The sun rose today in 20° to the north. It had [In l. margin: Nor[theasted] 3° 52′.] amplitude 16° 8′. Then it northeasted 3° 52′. [f. 88r]
On 4 on the same rhumb ———— 40 leagues.
On 5 on the same. In latitude 12° – 35 leagues.
The sun rose today in scarcely 22° to the north. It had 16° 44′ amplitude.
Northeasting resulted [In r. margin: Nor[theasted] 5° \frac{1}{4}] of 5° \frac{1}{4}.
On 6 to the west ———— 40 leagues.
On 7. The same ———— 40 leagues.
The sun rose today in 23° \frac{1}{2} to the north having amplitude 17° 16′. It resulted in northeasting 6° 14′. The aguja fixa and the ordinary [In r. margin: Nor[theasted] 6° \frac{1}{2}] the same.
On 8 to the west a quarter point from northwest ———— 25 leagues.
On 9 on the same. We went to 14° \frac{1}{2} ———— 35 leagues.
On 10 on the same ———— 40 leagues.
On 11 on the same, making an altitude of 13° \frac{1}{2} – 40 leagues.
On 12 on the same ———— 25 leagues.
Today the sun set in 10° to the north. It had amplitude barely 10°. It resulted in northeasting.
[In l. margin: Nor[theasted] 10° | 9°
On 13 on the same ———— 25 leagues. We went to 14° \frac{1}{4}.
On 14 on the same ———— 25 leagues.
On 15 on the same ———— 25 leagues. Today the altitude was taken precisely and we got to 15° \frac{5}{6}.
On 16 to the west a quarter point , to the northwest ———— 30 leagues.
On 17 to the west ———— 25 leagues.
12v [f. 88v]
The sun rose today in 31 Gr. to the north. It had amplitude 20° 9′ in 16° \frac{1}{2} of altitude; by which [In l. margin: Nor[theasted] 10° 51′] the variation resulted in 10° 51′.
On 18 to the west a quarter point to the northwest ———— 25 leagues.
Today we took the latitude in 16°.
On 19 on the same ———— 25 leagues.
Today the sun set in 10° to the north. It had amplitude 20° 40′; with altitude 16°. Then [In l. margin: Nor[theasted] 10° 40′] the variation was 10° 40′.
On 20. We went ———— 30 leagues.
On 21 to the west a quarter point. from the northwest ———— 25 leagues.
The sun set today in 10° to the north. It had [In l. margin: Nor[theasted] 11° 5′] amplitude 21° 5′; in an altitude of 17°. Then the variation was 11° 5′.
On 22 of May ———— 26 leagues.
On 23 we went ———— 25 leagues.
The sun rose today in 31° to the north. It had [In l. margin: Nor[theasted] 9° 21′] amplitude 21° 39′ in an altitude of 17°. Then the variation [was] 9° 21′. The ordinary ones varied 11° 20′.

5This appears to be a later pagination number.
On 24 we went ————- 35 leagues.
On 25 we went ————- 33 leagues.
The sun rose in $29^\circ$ to the north. It had amplitude $22^\circ$ in an altitude of $17^\circ$. Then it varied [In l. margin: Nor[theasted] $7^\circ$] 7° to the northeast. [f. 89v]
On 26 to the west a quarter point from the southwest – 30 leagues. We went to $16^{\circ}\frac{1}{2}$.
On 27 on the same rhumb.
It rose today in $28^\circ$ to the north. It had amplitude $22^\circ19\text{'}$. Therefore it varied $5^\circ\frac{2}{3}$. [In r. margin: Nor[theasted] $5^\circ\frac{2}{3}$.
In the afternoon I rectified this observation because there was less rocking and it was easier and it went to $7^\circ\frac{1}{3}$ variation because the sun set in $15^\circ$ to [In r. margin: $7^\circ20\text{'}$,] the north.
On 28 on the same rhumb.
On 29 to the west a quarter point from the northwest —- 30 leagues. We saw the Ladrones Islands [Mariana Islands] in the morning. One high [In r. margin: Ladrones Islands.] and rounded. The point above was cut off. It was 6 leagues in length, and from there to the other island which ran with it northnortheast-southsouthwest a distance of 5 leagues much bigger from northwest-southeast 4 leagues away. To the northeast of the point another 12 leagues [In r. margin there is a sketch of two islands, see main text] one somewhat smaller, and further to the northeast another 6 leagues. The point is in $16^{\circ}\frac{3}{4}$ because the altitude was taken. Several boats left from the Ladrones set out to us.

Today in the afternoon I marked the compass and the sun set in $16^{\circ}\frac{1}{2}$ from the west to the north It had [In r. margin: Nor[theasted] $6^\circ4\text{'}$,] amplitude $22^\circ34\text{'}$. The difference was $6^\circ4\text{'}$ and the compass northeasted by that much. [f. 89v]
On 30 on the same rhumb ————- 25 leagues.
On 31 on the same ————- 30 leagues.
June.
On 1 to the west a quarter point to the southwest ———— 30 leagues.
On 2 on the same ————- 40 leagues.
On 3 on the same ————- 20 leagues.
On 4 on the same ————- 30 leagues.
The sun rose in $25^\circ$ to the north. It had amplitude [In l. margin: Nor[theasted]$1^\circ46\text{'}.$] $23^\circ14\text{'}.$ in an altitude of $14^\circ$. We estimated the difference was $1^\circ46$ minutes of northeast ing.
On 5 to the west yawing a quarter point. —- 30 leagues.
On 6 on the same ————- 18 leagues.
On 7 on the same ————- 20. legas.
On 8 on the same ————- 15 leagues.
Today the sun set in $22^\circ30'$ to the north. It had amplitude $23^\circ33\text{'}$. minutes in an altitude of $13^\circ$. The difference which is $1^\circ3\text{'}$ is what the compass northeasted. [In l. margin: Nor[theasted] $1^\circ3\text{'}$]
On 9 on the same ————- 25 leagues.
On 10 on the same ———— 25 leagues. Today we came on Cape Spiritu Santo, to the southwest. This morning the aguja fixa stayed.

→ Finis →

[End of f. 89v]

Table 1: The magnetic variations on the 1611 voyage.

<table>
<thead>
<tr>
<th>Date 1611</th>
<th>De los Ríos rutter</th>
<th>Santa Ana rutter</th>
<th>Comment</th>
<th>Compass error</th>
<th>Compared with ordinary</th>
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<tr>
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<td>Aguja fixa</td>
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<td>24.3</td>
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<td>2.G.53</td>
<td>13' Sword</td>
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<td>3.4</td>
<td>2. 15</td>
<td>4.G.15</td>
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<td>5. G 30</td>
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<td>be 3g’s 23</td>
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<td>5.G.12</td>
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<td>8G.23’</td>
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References