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Value of the Mile Used at Sea by Cristobal Colon During His First Voyage

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INTRODUCTION

A study of the route borrowed by Colon during his voyage of discovery of America has to refer to the indications given us in the extract made by Las Casas of the copy made by the royal copiers of the *Book of the First Navigation* that he gave to the Kings.

Because of the complex origins of this data, if a serious study is to be made, it will have to be verified as far as is possible in its authenticity, basis and logic.

As far as the value of the mile used at sea by Colon is concerned Europeans have, it seems, always taken for granted (perhaps too easily) that it was the Roman mile, or 1480 meters about, that was used. On the other hand, the American scholars are not unanimous on this point. I have here a book entitled *In the Wake of Columbus* in which a study is made concluding that the value of the mile does not correspond with the value usually admitted.

Since I have the solution to this question, I feel it my duty to share it with all scholars who might be troubled by this divergence of opinion.

The following will demonstrate quickly and unequivocally that the mile used at sea by Colon during his first voyage and, logically also during his other trips, was about 1480 meters as have accepted, without verification, many scholars.

STUDY

The determination of the length of this mile is so simple that one could compare this problem with the well known story of — Colon's egg!

In effect a simple, but careful, examination of a passage taken from a known and uncontested document gives us the answer. A document which everyone seems to have overlooked until now. What seems extraordinary isn't the fact that the real value of the mile has finally been determined but that someone else had not done it long ago!

Perhaps we should see in this the consequence of the fact that no true seaman seems to have closely examined the problems posed in Colon's navigation.

First Approach

Thanks to one clearly visible clue we can already safely presume that the mile used at sea by Colon was the Roman mile. In the *Extract of the Log* in the tenth and eleventh lines under the date Sunday, December 9, 1492 (at this date Colon was in the harbor he named Puerto de la Concepcion) Colon states: "This harbor measures at its mouth, one thousand paces which are one quarter of a league." And as far as known, only the Roman mile is said to measure one thousand paces.

Demonstration

If we still search for an irrefutable proof of the unit of measure used at sea by Colon, it is simply because we can find nowhere in the writing of Colon a clear definition of what he considered a mile to be. This would have satisfied scholars and thus ended the discussion. Unfortunately this is not possible.

In our day, when we speak of a length using a certain unit of measure, the unit of measure used is purely conventional and accepted by all. We would have great difficulty explaining its value, except by comparison. We could say for example: from here to here there are X units of measure; or, the unit of measure represents the length of this object. The definition of the meter is nothing more, nothing less!

From this it appears that the only possible method to determine the length of the mile of Colon, is that for a given distance, for example between two precisely located points, we can compare the value given in Colon's miles with that of the real distance.

But if, in principle, this seems simple, one has to find *where* to apply this ideal method! For, until now, no one has been able to find two points given by Colon for which he gave the distance separating them in miles. Either the measurements given by Colon didn't represent, or didn't form when added together, a complete distance between two points (not to speak of data clearly altered in successive copies which eliminates them automatically, and other distances clearly estimated and rounded off, which are automatically imprecise); or the two points of which Colon spoke are not clearly identifiable and therefore doubtful and subject to criticism. Should we then give up all hope of finding the true value of Colon's mile? No, we should not! For the necessary elements exist, and, even better, they exist in the *Extract of the Log*. The part of the Log that interests us in this demonstration is given at the end of this study. You may refer to it.

We will now go back to February 1493 . . .

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After an agitated crossing from Hispaniola, during which a storm separated him from the Pinta, Colon found himself on the Isla de Santa Maria of the Azores. There, troubles with the local inhabitants cost him several days. Finally things were worked out. During the night of Saturday the 23rd — Sunday the 24th he lifted anchor and set sail to the east, toward Castille. That is, toward Palos, automatically passing by that remarkable landmark, the Cabo de San Vicente.

Notice that in doing this Colon navigates on the straight line joining his starting point, the Isla de Santa Maria, to his goal, the Cabo de San Vicente. This is easily seen on the map in Fig. 1. In this way we have two perfectly identifiable points given by Colon. Two points for which we know the real distance.

When Colon has completed about half of his trip, the weather changes and he sees that a storm is coming. Colon does what any seaman would do in these circumstances: he immediately makes the necessary calculation and estimations to find his position before the storm. In this way he possesses a precise point of reference before being thrown off course by bad weather. This will enable him to make a good dead reckoning after the storm in order to continue navigation toward his original goal.

Up until now Colon has been navigating unknown waters, waters for which there is no existing documentation. Now the situation is different. Maps exist, and evidently Colon has them in his possession.[1] Therefore, he will not be forced to chart his course on a map he draws himself as he progresses and says: "I estimate that I have traveled X miles (sometimes this is the sum of several shorter distances) on this course (this also may be the sum of several directions)", with this estimation originating from a point behind him.

Now he can put his finger on his map and simply say: "I am here in comparison to this and that point of reference on my map!"

This changes everything and this is our chance to find the answer to our problem. For Colon, by navigating practically in a straight line[2] joining two of his reference points, the Isla de Santa Maria and the Cabo de San Vicente, gives us, by the sum of the two distances separating himself from these two points, the distance between them, expressed in miles. The miles used by Colon! This number, compared to the real distance, will give us the value of the mile he used at sea.

Let us see what the *Extract of the Log* says for the date of February 27, 1493:

". . . He was one hundred and twenty five leagues from the Cabo de San Vicente, eighty from the Isla de la Madera and one hundred and six from Santa Maria."

Therefore for Colon and in the miles used by him at sea, the distance between the Isla de Santa Maria and the Cabo de San Vicente would be: 125 leagues + 106 leagues = 231 leagues or 924 miles. And the distance

between these two points is approximately 964 Roman miles of 1480 meters. The map in Fig. 2 helps us to visualize all of this.

But once we have established these figures are we going to make a ridiculous calculation telling us that Colon used a mile equal to 964/924 of a Roman mile or 1544 meters? Should we conclude that Colon used this unit of measure? A unit of measure with no historical basis which would be more than 68 meters longer than the well-known Roman mile! Of course not.

For what we measure in this way is simply the inaccuracy of the map with which he determines the distance separating the Isla de Santa Maria from the Cabo de San Vicente. For it is obvious that at this time the precision of sea charts was far from perfect and the approximately four percent of error we find here is already amazing!

CONCLUSION

From all of this, it is obvious that Colon really used the Roman mile of about 1480 meters. In fact this is what all the scholars, since they used this value in their work, had assumed intuitively without proving it.

NOTES

1. This new method of situating himself in relation to reference points he hadn't yet seen, and from which he says he is a given distance, is a particularity of navigation by map. It is also extremely logical that the seaman that Colon was would not leave without taking with him maps of regions he was susceptible of crossing. The precision of the map he used would lead us to believe that it was a map made by men who knew well this part of the ocean because of sailing there frequently. Therefore probably the Portuguese!

2. We say *"practically in a straight line"*, despite the fact that the text of Tuesday the 26th and Wednesday the 27th of February might lead us to think, after a first reading, that Colon was thrown off this course. We have several reasons to believe this: (1) the deviation from the straight line route resulting from the 8 leagues toward the east-northeast given Tuesday the 26th only represents an elevation to the north of 3. 2 leagues, which represent nearly nothing when compared to the total distance of 231 leagues. (2) while the deviation hinted at on the 27th is not given in figures, it shouldn't have been too large either. For the next day, when the deviation was large, he gave the necessary information. We should also note that, as we said in the study, it is more than probable that the point given by Las Casas is the point given before the storm. The point before being thrown off course. (3) All this is confirmed by the 80 leagues that Colon gives as his distance from the Isla de la Madera. For this is exactly the distance separating this island from the straight line joining the Isla de Santa Maria and the Cabo de San Vicente.

PARTS OF *EXTRACTS OF THE LOG* CITED

Sunday February 24th

. . . Seeing that the weather was favorable for traveling to Castille, he abandoned his idea of taking on wood and stones and steered to the east. Until sunrise, that is for about six and a half hours, he navigated at about 7 miles per hour, which made 45 1/2 miles. From sunrise to sunset, he navigated at 6 miles per hour for eleven hours. This made 66 miles, which with the forty-five and one half of the night gave 111 1/2 miles and in consequence 28 leagues.

Monday February 25th

Yesterday after sunset, he navigated on his course toward the east at five miles per hour. And during the thirteen hours of that night he traveled 65 miles which made 16 1/4 leagues. From sunrise to sunset he traveled another sixteen and one half miles and, thanks to God, on a flat sea. A very large bird that resembled an eagle came to the caravelle.

Tuesday February 26th

Yesterday, after sunset, he navigated on his course toward the east and, thanks to God, on a flat sea. He navigated 8 1/2 miles per hour the greater part of the night, thus traveling 100 miles which made 25 leagues. After sunrise, with a little wind and passing through some rain showers, he traveled about eight leagues to the east-northeast.

Wednesday February 27th

This night and today he navigated off his course because of contrary winds, great waves and the state of the sea. He was one hundred and twenty-five leagues from Cabo de San Vicente, eighty from the Isla de la Madera and one hundred and six from Santa Maria. He was quite dismayed at having to undergo a storm like this when he was at the doorstep of his house.
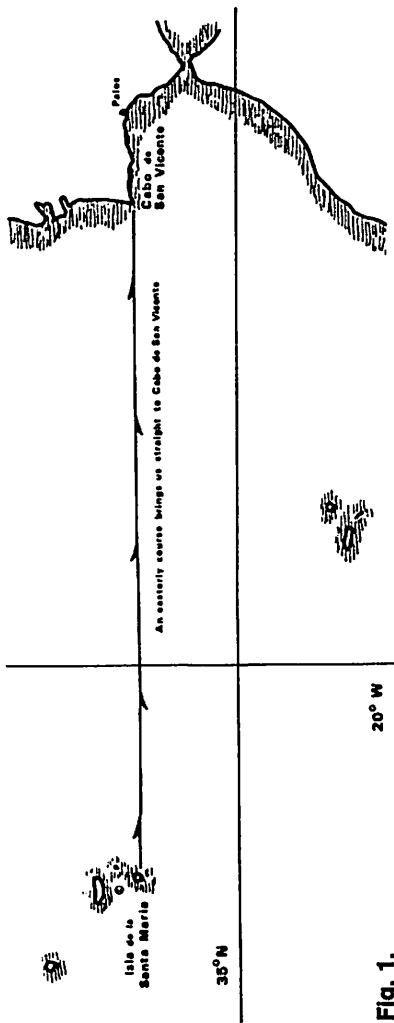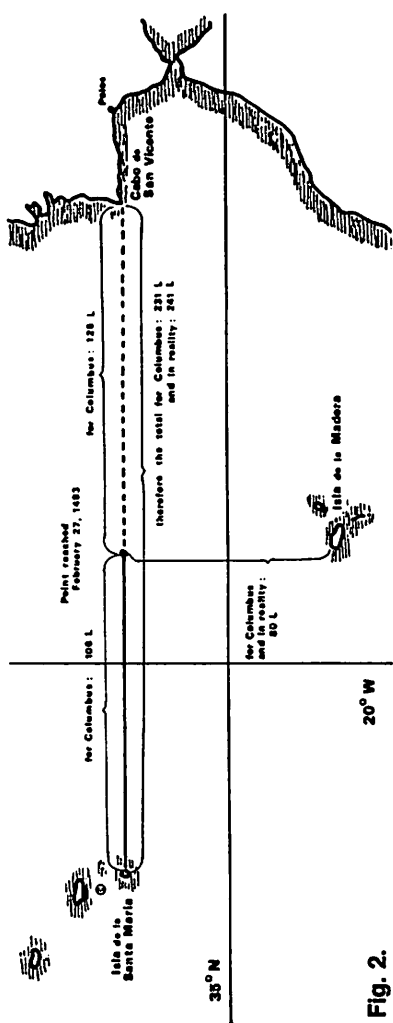
Fig. 1.

Palos

Cabo de
San Vicente

An easterly course brings us straight to Cabo de San Vicente

Isla de la
Santa Maria

35° N

20° W

Fig. 2.

Palos

Cabo de
San Vicente

Point reached
February 27, 1493

for Columbus: 106 L

for Columbus: 120 L

therefore the total for Columbus: 226 L
and in reality: 261 L

for Columbus
and in reality:
80 L

Isla de la
Santa Maria

Isla de la Madera

35° N

20° W

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