

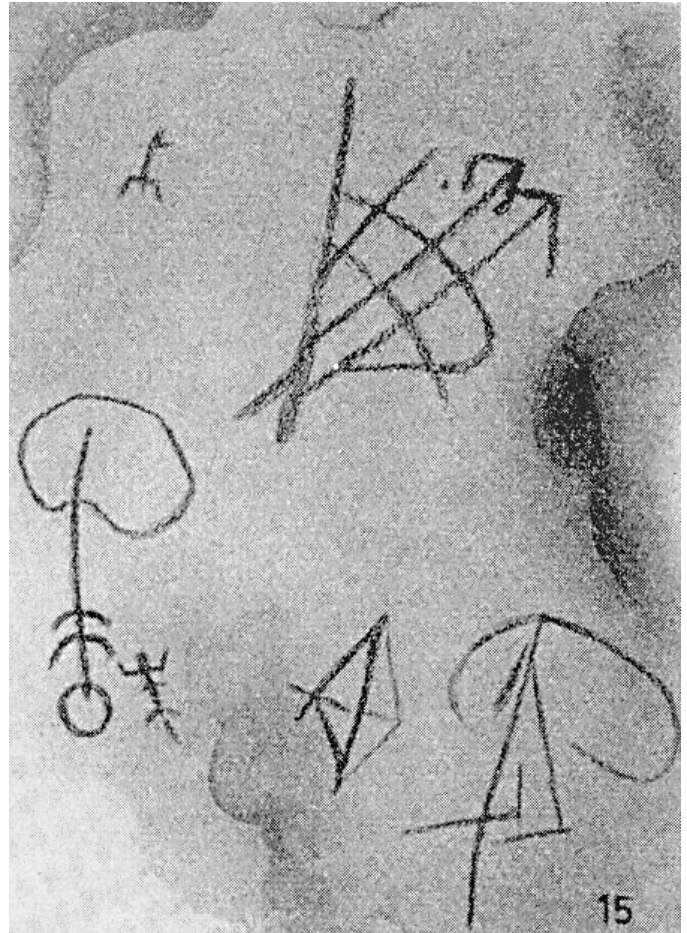
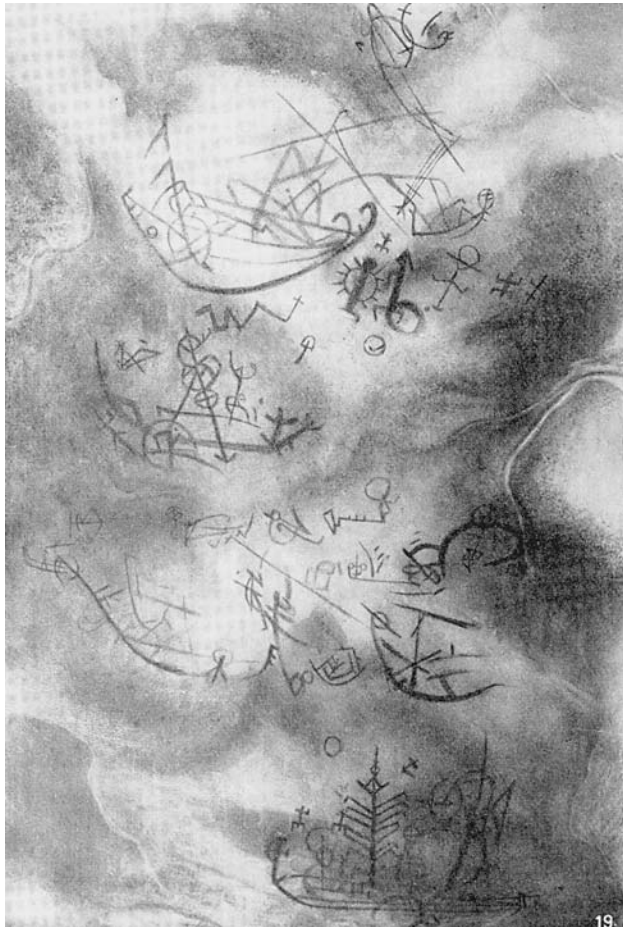
# A voyage around the world in the third century B.C.

by Marjorie Mazel Hecht

A flotilla of ships set sail from Egypt around 232 B.C., during the reign of Ptolemy III, on a mission to circumnavigate the globe. The six ships sailed under the direction of Captain Rata and Navigator Maui, a friend of the astronomer Eratosthenes, who was head of the Alexandria library. The commander and navigator knew from Eratosthenes that the circumference of

the Earth was 250,000 stades (approximately 28,000 miles), and they had state-of-the-art astronomical and navigational equipment. Although there is no record that the flotilla returned to Egypt, Maui and others left records of their voyage along the way.

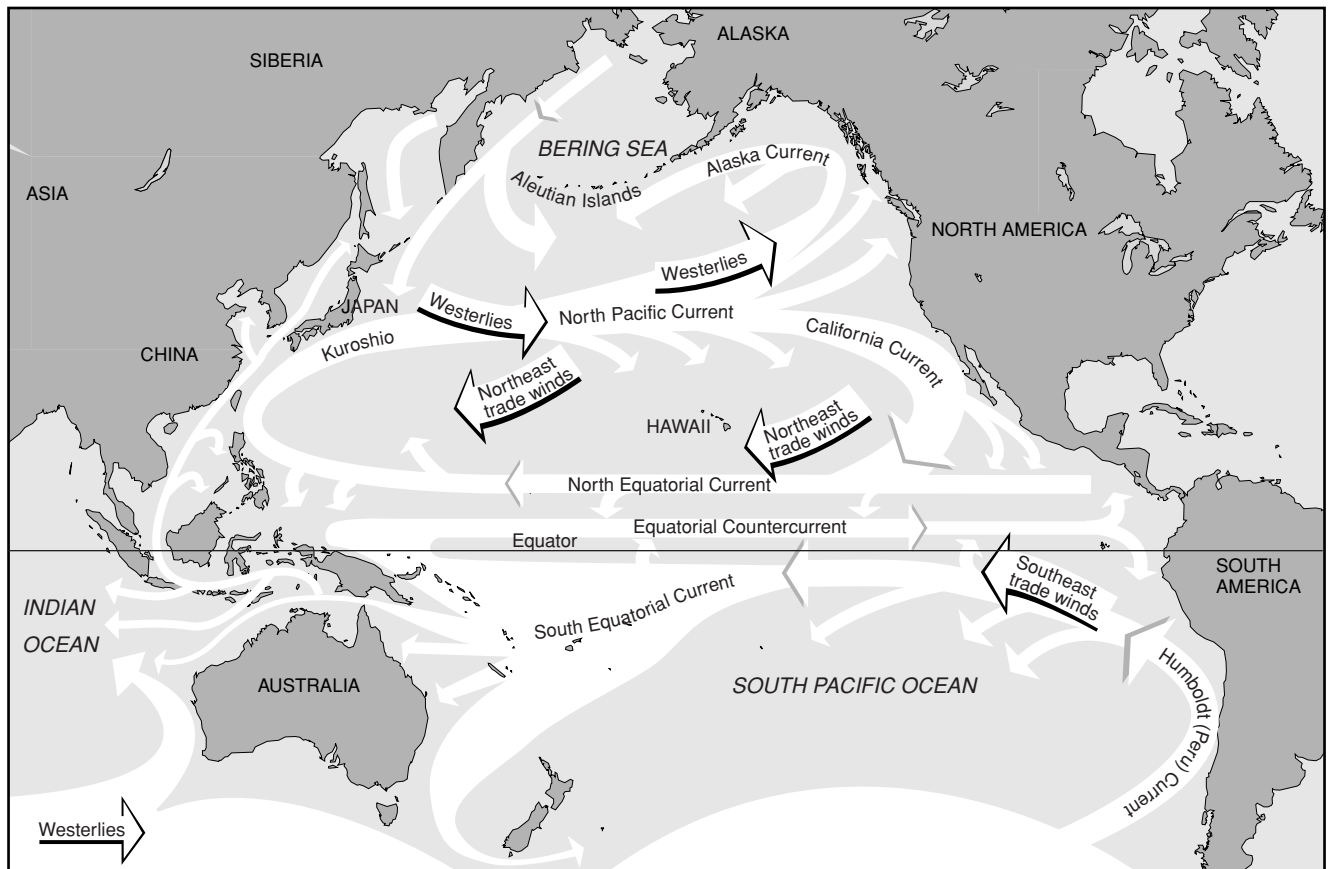
The details of the expedition are known to us through



*Inscriptions on the wall of one of the "Caves of the Navigators" in New Guinea, as photographed by Josef Röder of the Frobenius Institute. Photo 15 shows part of Maui's demonstration of Eratosthenes' experiment. Röder's exploratory expedition was concerned with ethnology, specifically the religious beliefs of the inhabitants in this area. The photographs are reproduced with permission of the Frobenius Institute at Goethe University.*

FIGURE 2

## The Pacific currents



The North Pacific Current or the Equatorial Countercurrent would have taken the voyagers across the Pacific to the coast of California, Mexico, or Central America. On a return trip, the Humboldt and Peru currents would have taken the voyagers across the Pacific.

Source: Adapted from *Mysteries of the Ancient Americas*, Joseph L. Gardner (ed.), Reader's Digest Association, Inc., 1986.

written inscriptions and drawings left in caves, primarily in what are now called the “Caves of the Navigators” in north-west New Guinea (now Irian Jaya), near McCluer Bay; a cave near Santiago, Chile; and others from Pitcairn Island and Fiji.<sup>1</sup> The New Guinea inscriptions and drawings were discovered by a German exploratory expedition in 1937, led by Josef Röder of the Frobenius Institute of Goethe University in Frankfurt, and the Chilean inscription was found in 1885, by the Chilean-German engineer Karl Stolp, but they were not deciphered until the 1970s, when marine biologist and linguist Barry Fell figured out the connection between the Maori (Polynesian) language and a dialect of ancient Egyptian-

1. The translations of the cave inscriptions originally appeared in the *Epigrapic Society Occasional Papers*, Vols. 1 and 2, 1974 and 1975. They are reprinted here with permission. For more information, contact the Epigraphic Society, Donal B. Buchanan, Secretary, 8216 Labbe Lane, Vienna, Virginia 22182-5244 or E-mail donalb@aol.com.

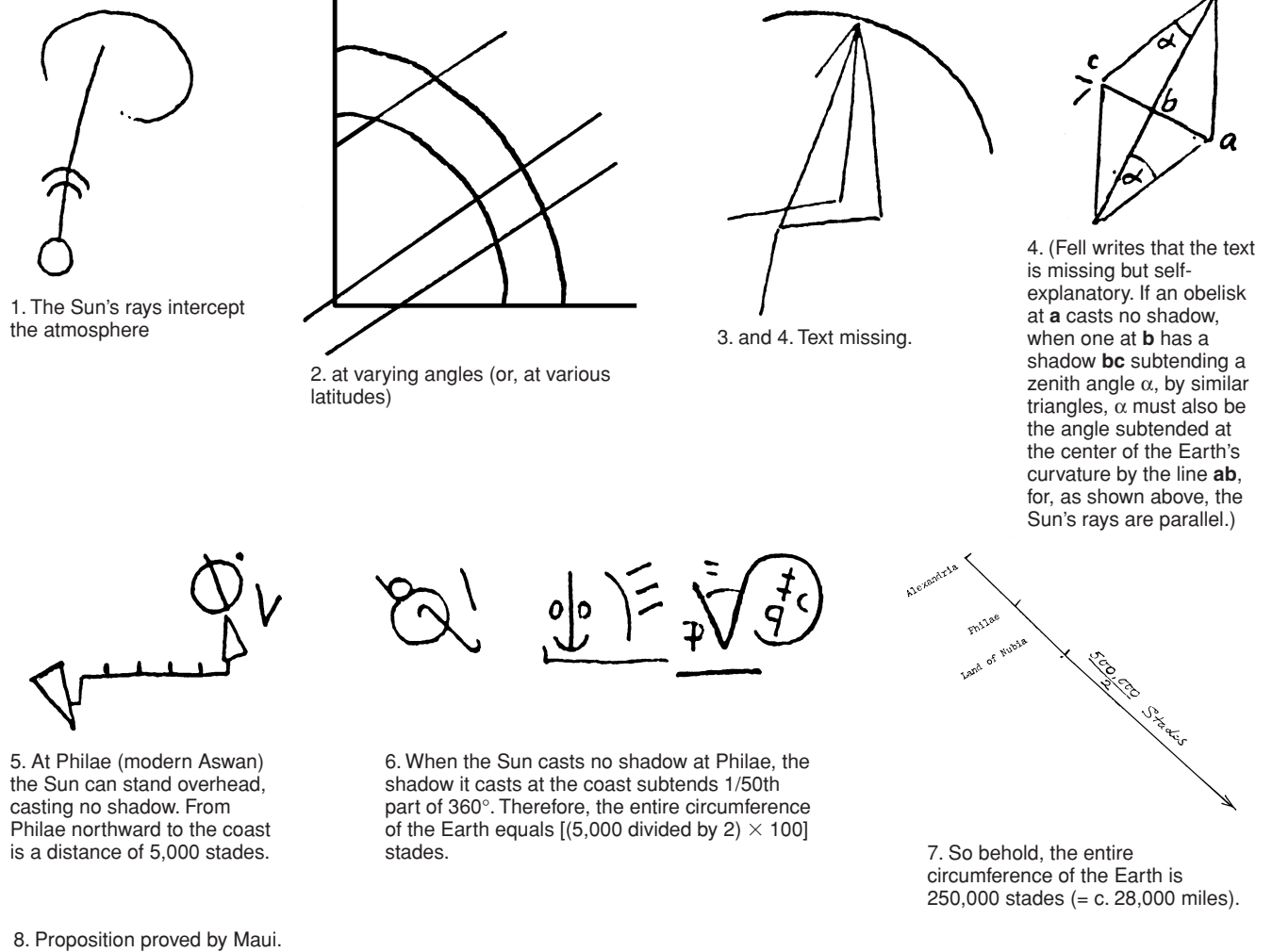
Libyan. Hundreds more ancient Maori inscriptions exist in the Polynesian islands, and, as Fell notes, there are also inscriptions in the ancient Egyptian-Libyan in North America.

In the early 1970s, Fell, a specialist in echinoderms (star fish), was teaching marine biology at Harvard University, at its Museum of Comparative Zoology. A native of New Zealand, Fell was an exceptional linguist, with a working knowledge of scores of languages, modern and ancient, including Maori. His passion for translating ancient inscriptions and his ideas about pre-Columbian settlements in America made him a controversial figure in archeology, and led him to write three books on the subject, the best known of which is *America B.C.*<sup>2</sup> Fell touched on some of the evidence of Egyptian-Libyan journeys to America in *America B.C.*, but the specific cave transcriptions discussed here appear only in

2. Barry Fell *America B.C.* (New York: Simon & Schuster, 1976).

FIGURE 3

**Maui's proof of Eratosthenes' measurement of the size of the Earth, as translated by Barry Fell**



*"This particular theorem Eratosthenes, an astronomer of the Delta country in Lower Egypt, disclosed to Maui." This inscription from the "Caves of the Navigators," which begins with the above quotation, was discovered by Josef Röder in 1937, but not translated until 1974, by linguist Barry Fell. It is reproduced here, with permission, from the Epigraphic Society Occasional Papers, Vol. 1, No. 18, Nov. 13, 1974. (See footnote 1.)*

the "Occasional Papers" of the Epigraphic Society, which he founded in 1974; they were not generally publicized.<sup>3</sup>

**The Eratosthenes proof**

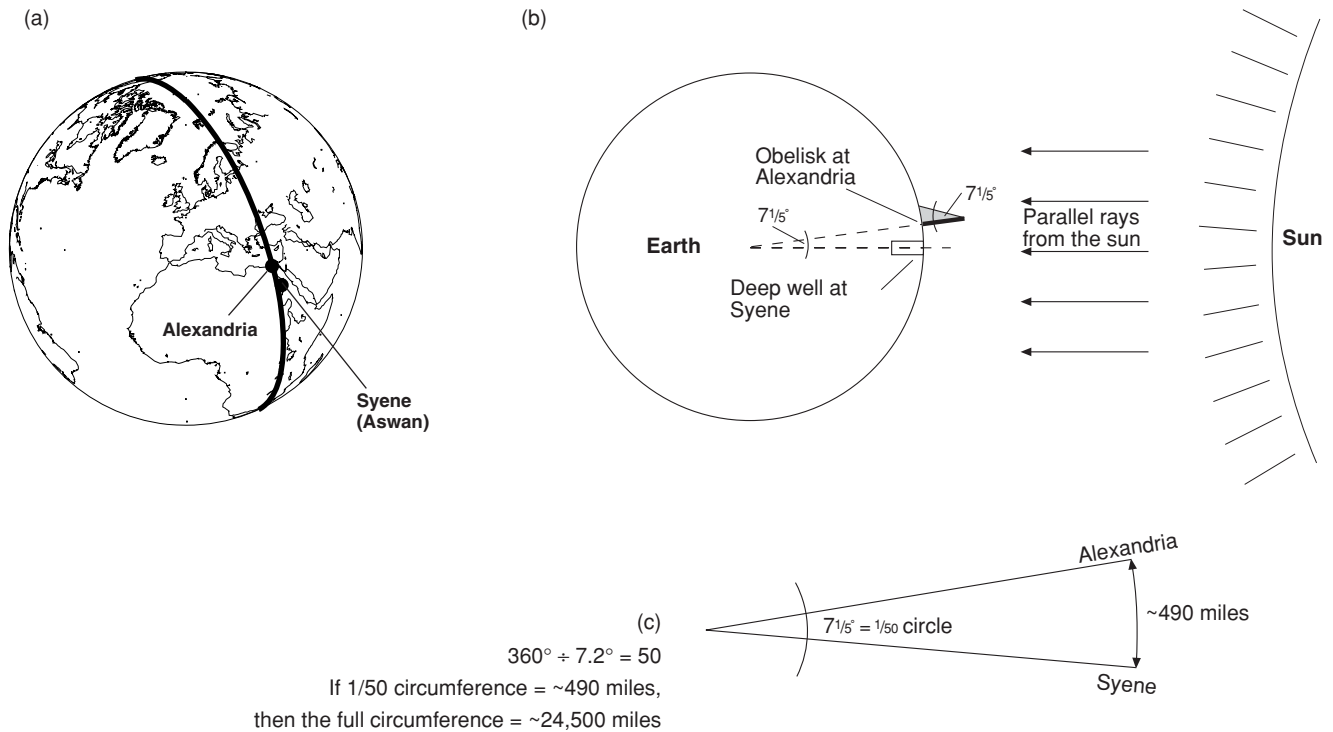
The New Guinea inscriptions include a concise proof, in words and drawings, signed by Maui, of the Eratosthenes

experiment at Syene and Alexandria to demonstrate that the world was round! The cave inscriptions and drawings are done in colored chalks and charcoal, which have been preserved by a thin layer of transparent stalactite. According to Fell, there are diagrams of ships and fishing gear, astronomical observations, "with illustrations of celestial phenomena and astronomical apparatus, including the cross-staff, a variable-angle sundial for use in various latitudes, a computing instrument for correcting zenith angles to latitude, dividers, set-square, charts of the sky showing particular constellations," and numerous religious drawings and paintings of

3. John Chappell, president of the Natural Philosophy Society, had known Fell at Harvard University, and brought the Egyptian expedition to our attention after reading about Eratosthenes in *21st Century Science & Technology* magazine.

FIGURE 4

**How Eratosthenes measured the unseen**



Eratosthenes' measurement of the size of the Earth was based upon determining the angle of arc between Alexandria and Syene (Aswan), cities that lie close to the same meridian at a walking distance of approximately 490 miles (a). At the same time that the Sun's rays shone directly into a deep well in Syene, they cast a shadow of  $7.2^\circ$  from the top of an obelisk at Alexandria (b). Eratosthenes' calculation of the circumference was remarkably accurate.

Graeco-Egyptian deities.

The dating of the occupation of these "Caves of the Navigators" is set as 235-225 B.C. Fell says that a detailed account of a solar eclipse is dated as in the 15th year of the reign of Pharaoh, which would coincide with the annular eclipse of Nov. 19, 232 B.C. (Were the caves used to teach astronomy and navigation to the crew, or to the native inhabitants? Was it to make sure that this knowledge would be preserved? These are only suppositions.)

Fell translates the most important inscription by Maui as follows:

Invocation to Tawera [the morning star, or Venus]

To cast off the mooring-rope is Maui's delight  
 For he is content to be showered with the salt spray.

He has been absent from home on a foreign voyage  
 These past eight years, Yet through Thee, O Divine  
 Morning Star, may he escape death,  
 That Captain of the Mariners, to find new lands  
 uplifted.

The elegant Eratosthenes proof appears next to this inscription. As Fell translates it, "This particular theorem Eratosthenes, an astronomer of the delta country in Lower Egypt, disclosed to Maui" (see **Figures 3 and 4**).

There are other, later inscriptions superimposed on that of Maui, which Fell says are imitative of the older work "and are attributed to Papuan cave artists." Fell's supposition is that the expedition was sent out by Ptolemy III both to find new sources of gold for coins and to demonstrate Eratosthenes' "newly propounded doctrine." The flotilla of ships did reach South America, according to the documentation below, but never returned to Egypt. When the Egyptians did not find a navigable passageway through America, the supposition is that they turned back to return the way they had come, across the Pacific. One ship was apparently wrecked on Pitcairn Island.

Fell proposes that Rata, Maui, and the other members of the expedition became the founding fathers of Polynesia. In fact, he says, the actual names Rata and Maui appear in Polynesian legend. Further, he says, the ancient Maori-Libyan language, writing, and knowledge became the "initial heri-

tage of Polynesia.” Libyan inscriptions, according to Fell, were found in New Zealand “as late as 1450 A.D.”

### South America claimed for Ptolemy III

At the Harvard seminar where Fell initially presented his translations, in November 1974, it was concluded that the voyage of Rata and Maui would probably follow a great circle route, according to Eratosthenes’ plan. Therefore, it could be expected that the expedition would land on the West Coast of America in 231 or 230 B.C., and that there would be similar inscriptions in American caves. It was thought that the flotilla would probably land around Panama or Baja California, and that the ships would then go both north and south to find a seaway through the land mass.

Learning of the November seminar, geographer George F. Carter, Sr., a professor at Texas A&M University with an interest in ancient inscriptions, recalled a cave inscription that he had copied down from a German-language scientific journal published in Chile, which he found at the Johns Hopkins University Library in Baltimore, in the 1950s, when he was teaching in the geography department there. The inscription was copied in 1885 by Karl Stolp, who had taken shelter in a cave near Santiago during a storm. Carter thought the script was similar to the Polynesian inscriptions. He was right: As Fell was able to translate it, the Santiago inscription gave the date as the “regnal year 16,” which would have been 231 B.C., and also had Maui’s name:

“Southern limit of the coast reached by Maui. This region is the southern limit of the mountainous land the commander claims, by written proclamation, in this land exulting. To this southern limit he steered the flotilla of ships. This land the navigator claims for the King of Egypt, for his Queen, and for their noble son, running a course of 4,000 miles, steep, mighty, mountainous, on high uplifted. August, day 5, regnal year 16.”

## The navigators of the Golden Renaissance

by Timothy Rush

The same connection between fundamental Platonic scientific method, and great voyages of discovery to prove the efficacy of that method, which blazed forth in the Eratosthenes-Rata-Maui enterprise, precisely characterized the revival of such voyages in 15th-century Europe.

The pivot point of the revival and further advance of Platonic scientific method in the period was centered in the collaboration of two intimate friends: Cardinal Nicolaus of Cusa (1401-64), and the astronomer, mathematician, and geographer Paolo dal Pozzo Toscanelli (1394?-1482). Their work

was installed as the central thrust of European Renaissance statecraft at the great Council of Florence (1438-41). Eratosthenes’ work was studied as a crucial feature of this revival.

Prince Henry the Navigator (1394-1460) of Portugal had already begun a systematic project to re-discover deep-sea sailing methods, as of 1415. This became known as Henry’s “Atlantic Enterprise,” and was centered in Sagres, at Portugal’s extreme southwest promontory. By the time of his death, in 1460, his caravels had reached the tropics in equatorial Africa, and (re)-discovered key way stations in the Atlantic: Madeira, the Azores, and the Cape Verde Islands. After his death, Henry’s project continued, and provided the foundation for the voyages of the next generation: Diaz, Columbus, and Da Gama.

Here are the crucial connections:

- The personal representative of the Portuguese royal house in Florence for the period 1415-40 was an abbot of the Camaldolese Order, Dom Gomes Ferreira da Silva. Dom Gomes was an intimate of Toscanelli and of the chief organizer of the Council of Florence, Ambrogio Traversari. In 1428, he arranged the meetings of Henry the Navigator’s brother, Prince Pedro, with Traversari and Toscanelli in Florence, from which Pedro returned to Portugal with an archive of the Florentine scientific re-discoveries. From 1436-39, Dom Gomes served as the Traversari’s “right-hand man” in arranging the Council of Florence; and upon Traversari’s death, a few months later, Dom Gomes assumed Traversari’s position as head of the Order. Gomes then returned to Portugal to supervise personally the implementation of the Council of Florence directives in Portugal.

- Dom Gomes’s successor was Canon Fernão Martins of Lisbon. Spending large portions of time as a churchman in Italy, he assumed duties as confessor to King Afonso V of Portugal. Cusa’s esteem for Martins was such that he put Martins as one of the four interlocutors in the last of his dialogue masterpieces, *De Non Aliud* (On the Not-Other). (Martins was referred to in the manuscript as Ferdinando Martin Portugaliensi Natione.) At Cusa’s death a year later, in 1464, Fernão Martins and Toscanelli were both named as executors. In 1474, Toscanelli and Martins corresponded on the possibilities of going west to reach the Indies, and Toscanelli sent Martin the map, which was later forwarded to Columbus and which guided Columbus in his voyage.

It was not a question of the *influence* of the Cusa-Toscanelli circle on the Portugal of Henry the Navigator, but of *one single circle of personal collaborators*.

### Breakthroughs in deep-sea sailing

The breakthroughs in deep-sea sailing proceeded exactly as they had in the earlier Eratosthenes-Rata-Maui collaboration.

One of the major features, was the use of large-scale wind and current patterns far out from coast-wise “sense-certainty” sailing, to accomplish feats no “linear” approach could pro-