

Doubling the World

Enough for us that the hidden half of the globe is brought to light, and the Portuguese daily go farther and farther beyond the equator. Thus shores unknown will soon become accessible; for one in emulation of another sets forth in labors and mighty perils.
—PETER MARTYR (1493)

The 1400s in a Nutshell: Discovering the Unknown

In the West:

- Ptolemy (geography) is revived
- The Portuguese begin the first state sponsored continuous exploration
- Spain Responds (via efforts of Christopher Columbus)
- A new continent is discovered

In the Middle East:

- The Arabs stagnate; maintain their roles as middle men traders

In the East:

- The Chinese explore one-third of the planet; then stop cold

THE blocking of the land paths proved a godsend. Driven by new incentives to go to sea, Europeans would discover waterways to everywhere.

From the whole period of the **Great Interruption**, the fourth until the fourteenth century, no mariner's charts survive. In that age of widespread illiteracy, sailors passed on their traditional knowledge by word of mouth. From about 1300, however, we do find Mediterranean sea charts (portolanos), offering useful details for the next generation of mariners.

To reach Asia by water from the Mediterranean countries **meant leaving the closed for the open sea**. Mediterranean voyages were mostly coastwise sailing, which meant relying on personal experience of those particular places—local winds and currents, familiar landmarks, well-known offshore islands and the distinctive silhouette of a neighboring mountain.

When Portuguese sailors advanced southward down the coast of Africa, they left behind all familiar landmarks. The farther down they went, the farther away they were from the reassuring details of the **portolanos**. **There was no accumulated experience and there were no handy guides.**

Ptolemy's World Map 1467 (pp 152-153)

Here entered—or, rather, reentered—the great Ptolemy. It was just about this time, when the land curtain thudded down across the European land paths to the East, that the geography of Ptolemy was revived to refresh and reform the thinking of European Christians. If there is a connection between these events, we do not know it, but the coincidence was pregnant for the future of the world.



Note no passage around Africa - No America - short direct passage to Asia

The African Blockade

Before European seafarers could respond to the challenge offered them by the closing of the land passages to Asia, the south African part of Ptolemy's world map would have to be revised.

In fact, the very meaning of "Ocean" would have to be changed. Until that time Europeans made a sharp distinction between the Ocean and a sea (mare).

Evolution of our understanding of the Ocean

In the 1300s, the Ocean led nowhere; in the next centuries people would see that it led everywhere.

Only gradually, in the course of the fifteenth century (1400s), did "Ocean" come to have this revolutionary modern significance. Till then the Atlantic Ocean was not commonly listed among the "seas" of the earth.

The sea route to India would have to be opened in men's minds, and on their maps, before it could be traversed in ships. And so it was.

The openings in the mind preceded *and made possible* the struggle for the openings on the sea. In this respect the finding of a sea route to the Indies was quite different from the finding of America, which occurred on the earth before it had happened in men's minds (i.e. the Viking Leif Ericsson!)

Fra Mauro's Planisphere – last great Medieval Map (p 154)

These openings of the mind and of the map occurred decades before we know of any European actually rounding the Cape into the newfound Indian Ocean.

Example: the famous "planisphere" (1459) of **Fra Mauro** (the last of great medieval maps).

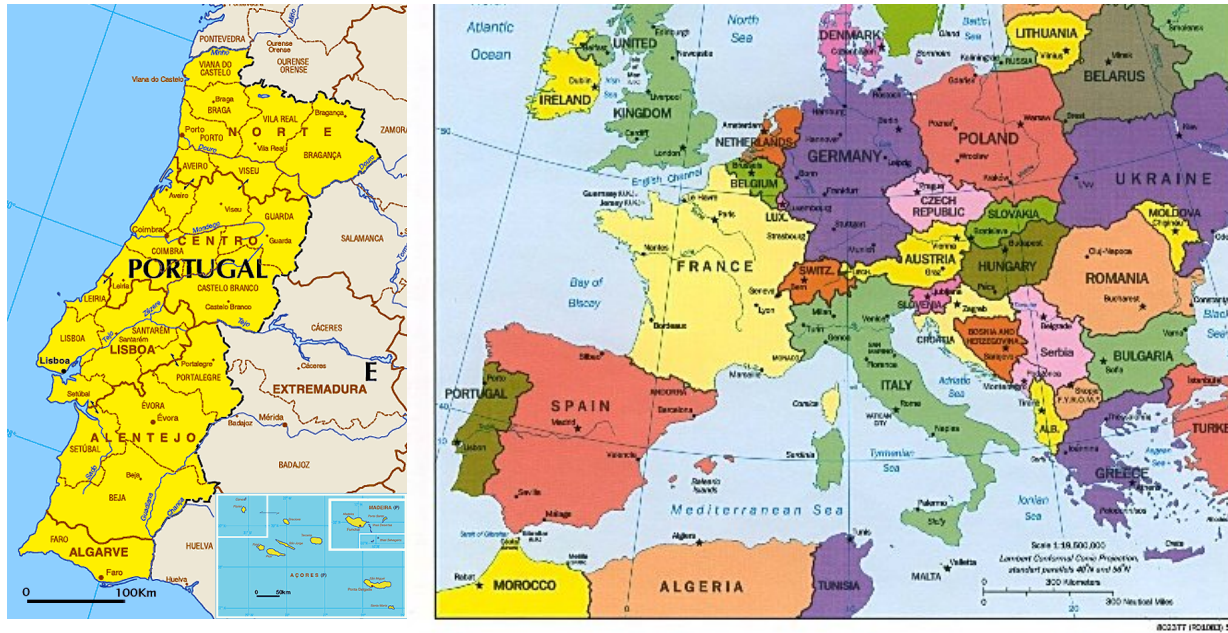
Fra Mauro's planisphere is also one of the first modern maps. For **he now shows the ocean no longer as the forbidden road to nowhere, but as a sea highway to the Indies.**

Fra Mauro pays his respects to Ptolemy, but explains that to follow the Master's scheme of latitude and longitude, one must change some of Ptolemy's maps.



Fra Mauro's planisphere (1459) is perhaps the result of the stories of Nicolo de 'Conti, who upon his return from his travels, brought back rumors that water surrounded all of Africa (p 155)

Portuguese Sea Pioneers (pp156-159)



AMONG those most encouraged were the seamen of Portugal, who had an assignment from geography for their role in history. On the westernmost edge of the Iberian peninsula, the nation attained its modern borders very early, in the mid-thirteenth century. Portugal had no window on the Mediterranean—the "Sea-in-the-Midst-of-the-Land"—but was blessed by long navigable rivers and deep harbors opening ocean ward. Cities grew up on the shores of waters that flowed into the Atlantic. **The Portuguese people, then, naturally faced outward, away from the classic centers of European civilization, westward toward the unfathomed ocean, and southward toward a continent that for other Europeans was also unfathomed.**

Europe and Portugal in the 1400s: Ripe conditions

Hundred Years War and Wars of the Roses:

For most countries of Western Europe the fifteenth century—the epoch of the Hundred Years War and the Wars of the Roses—was a time of civil strife and/or fears of invasion.

Byzantine Empire Falls:

The Turks captured Constantinople in 1453, menaced the whole corridor between Eastern Europe and the Balkans. They established a firm grip and walled Europe off from the East.

Spain:

the only country that shared some of Portugal's peninsular advantage (though diluted by the competition of her prosperous Mediterranean ports), was torn by civil strife and religious persecutions that for most of the century kept her near anarchy.

Portugal:

in sharp contrast to all these others, was a united kingdom for the whole of the fifteenth century and was hardly touched by civil disturbance. There was no religious persecution. Muslims, Jews, and Christian flourished; intellectuals abounded.

There ALWAYS has to be a great leader to inspire

Still, to exploit its many advantages, **Portugal needed a leader**—someone to draw people together, to organize resources, to point the direction. **Without such a leader all other advantages would have been nothing. That leader was Prince Henry.**

Prince Henry “The Navigator” was a curious combination of a bold heroic mind and an outreaching imagination, with an ascetic stay-at-home temperament. Frigid to individuals, he was passionate for grand ideals. His talent of obstinacy and his power to organize proved essential for the first great enterprise of modern discovery.

Prince Henry of Portugal



The father of continuous discovery

King John I had six sons, the third of whom was Henry (b. 1394), who had no chance at becoming King.

After leading a sea armada in an invasion of cities in Morocco, he learned about the trade coming across Africa: gold, silver, spices, and an abundance of other exotic various riches.

When the Portuguese took over, the trade to the area dried up. So Henry researched the trade routes and found they came from the East of Africa.

Embarrassed by King John I, he “stayed clear” of the court and moved to Promontorium Sacrum (“Sacred Promontory”)- Sagres. At this sacred location in Portugal, with resources from the crown, he began something that had never been done in the history of humanity.

Cape Sagres: NASA's Houston to the Sea Race (pp 159-164)

At Cape Sagres Prince Henry initiated, organized, and commanded expeditions on the frontier of mystery. In the first modern enterprise of exploring, he sent out an unbroken series of voyages into the unknown.

Henry created the first Research and Development Laboratory, where he brought together, for the first time, the essential ingredients for continuous discovery: books and the charts, sea captains, pilots, mariners, mapmakers, instrument and compass-makers, ship builders and carpenters, and other craftsmen.

He planned voyages, assessed the findings, and prepared expeditions successively farther into the unknown.

He set up a system of incremental knowledge recording.

The work Prince Henry started would never end.

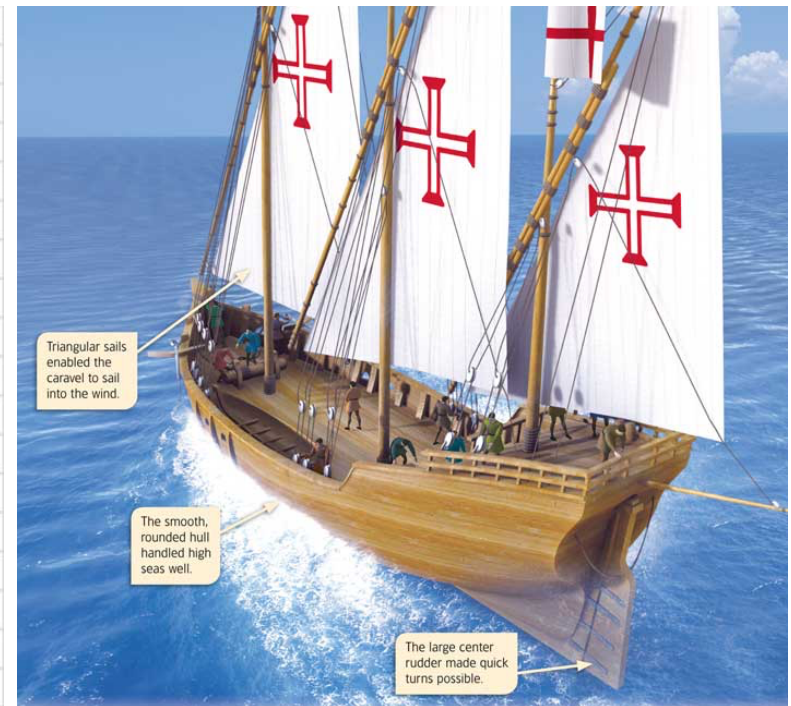


Cape Sagres



The Technology Breakthrough: The caravel

The **caravel** was one of the most **important** ships in the history of the world. In the 15th and 16th centuries, this ship was used to traverse the immense barrier to the New World. Its biggest attribute was that it could sail up wind and return to home.



The caravel class ship was the Saturn V (“moon rocket”) of the Space Race

Cape Bajador - The Cape of Fear (pp 165-167)



Cape Bojador was no worse than a score of other barriers that skillful Portuguese sailors had passed and survived. But this particular Cape Bojador they had made their *ne plus ultra*. You dare not go beyond!

From 1433 to 1460 it was SLOW GOING. Expeditions in 1433, 1434, 1435, 1436, ..
By 1441, they had gone only 250 miles beyond the Cape! In 1444, the first African slaves were brought back to Portugal.

At the time of Prince Henry's death in 1460 the discovery of the west African coast had only begun, but it was well begun. The barrier of groundless fear had been breached in what became the first continuous organized enterprise into the unknown. **Prince Henry therefore is properly celebrated as the founder of continuous discovery.**



Prince Henry
(under King John I)



King Alfonso V
(PH's nephew)
1469-1481 (p 168-169)



King John II
1481-1495 (p 169)



King Manuel I
"The Fortunate"
1495-1521 (p 174)

Four generations carried on the exploration!

- Under **Alfonso**, exploration made profitable.
- Under **John II**, India was reached.
- Under **Manuel I**, exploitation was refined, cold war with Spain started, and Portugal was a world power.

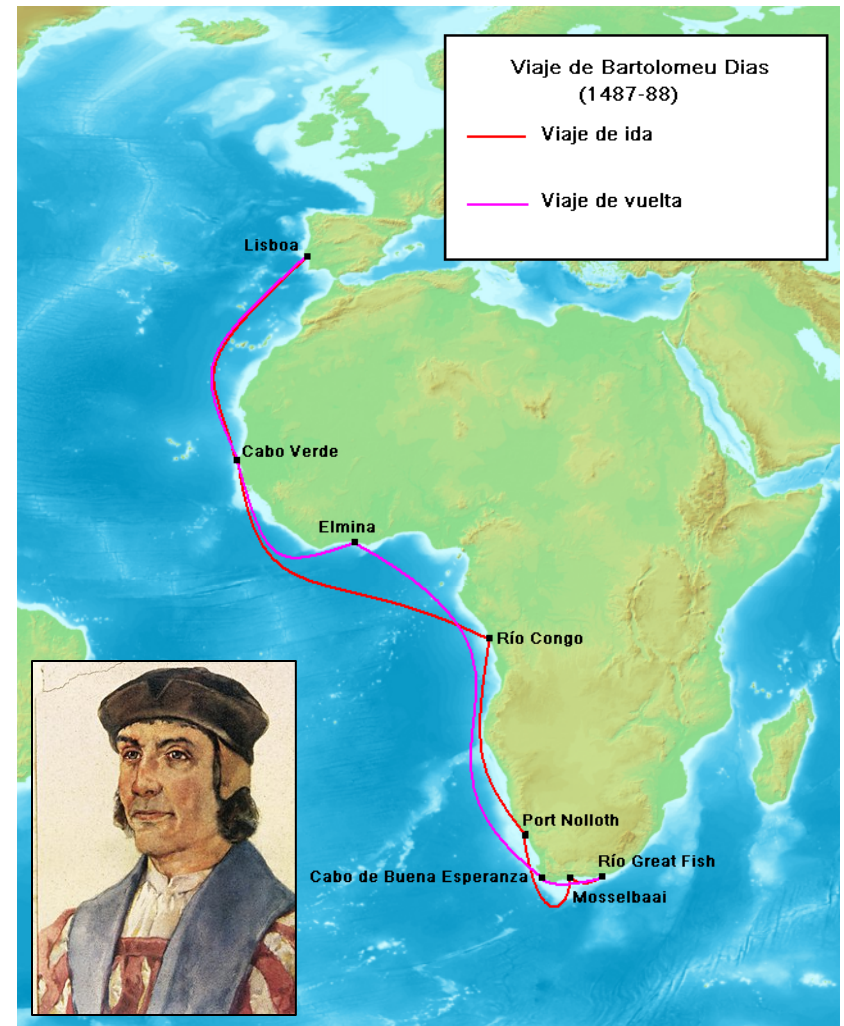
10 year hiatus due to "cold war" with Spain after India passage discovered!

Bartholomeu Dias (pp 172-174)

Under King John II

The crew, who had just suffered tropical heat at the equator, were panicked. "And as the ships were tiny, and the seas colder and not such as they were familiar with... they gave themselves up for dead." After the storm, Dias steered east with all sails hoisted, but for several days he still sighted no land. Turning north for 150 leagues, he suddenly viewed high mountains. On February 3, 1488, he anchored in Mossel Bay, about two hundred thirty miles east of what is now Cape Town.

The providential storm, achieving what no planning could yet accomplish, had driven him around the southern tip of Africa. When the men landed, the natives tried to drive them off with stones, Dias himself killed one of them with an arrow from his crossbow, and that was the end of their encounter. He followed the coast, which now plainly ran to the northeast, another three hundred miles to the mouth of the Great Fish River and into Algoa Bay.



The path of Bartholomeu Dias, who accidentally discovered the route around southern Africa, and then was forced to turn back by his crew, thus robbing him of fulfilling his dream of being the first European to sail to India.

Dias wanted to go on into the Indian Ocean, and so fulfill the hope of many centuries, but the crew would have none of it. "Weary, and terrified by the great seas through which they had passed, all with one voice began to murmur, and demand that they proceed no farther."

After a meeting of his captains, who all signed a sworn document declaring their decision to turn back, Dias agreed. As the ships turned about, Dias passed the stone marker they had set up to note their coming, "with as much sorrow and feeling as though he were taking his last leave of a son condemned to exile forever, recalling with what danger to his own person and to all his men they had come such a long distance with this sole aim, and then God would not grant it to him to reach his goal."

HISTORICAL MOMENT OF IRONY

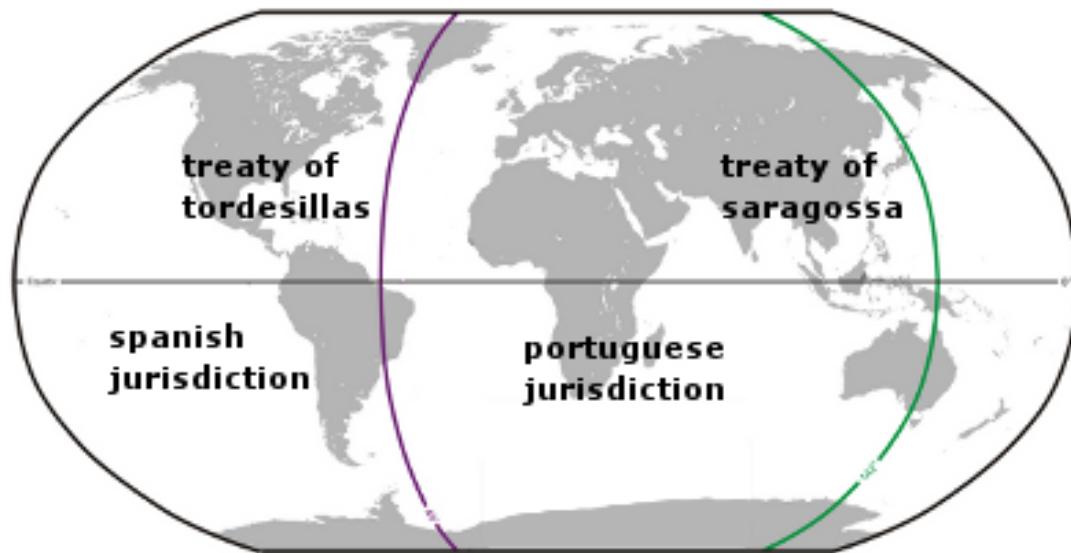
When Dias' weather beaten caravels came sailing into Lisbon harbor, there awaiting them was the still-obscure Christopher Columbus. The outcome of Dias' voyage was of immediate personal interest to him. For Columbus was then in Lisbon making another effort to persuade King John II to support his own seaborne expedition to the Indies by sailing westward across the Atlantic. Four years earlier, in 1484, when Columbus had first come for that purpose, the King had referred the project to a commission of experts, who turned him down, probably because they thought he had grossly underestimated the sea distance westward to the Indies. But Columbus had then impressed the King with his "industry and good talent" and now had come back to renew his request. Dias' moment of triumph was a season of disappointment for Columbus. For the eastward sea route to the Indies around Africa was now feasible and Columbus' project was superfluous.

A quick follow-up to Dias' discovery might have been expected. But the next step was delayed—by domestic problems in Portugal, by a disrupted succession to the crown, and especially **by the running dispute that kept Portugal on the brink of war with Spain.**

Ironically, **the discoveries of Columbus** himself proved to be the **principal cause of these troubles**, which postponed for a full decade the sequel to Dias' rounding of the Cape. **When King John II received word of Columbus' discovery of new islands in the Atlantic, he announced, in March 1493, that these new lands, because of their proximity to the Azores and for other reasons, rightly belonged to Portugal.** The ensuing disputes between King John of Portugal and King Ferdinand of Castile, and their rivalry for the support of the Pope, who presumably had the power to assign to Catholic kings the worldly governance of all newly discovered parts of the earth, resulted in the famous **Treaty of Tordesillas (June 7, 1494).**

Spain and Portugal both acquiesced in **a papal line which was to run north and south at 370 leagues (about 1,200 nautical miles) west of the Cape Verde Islands.** Lands to the west of the line would belong to Spain, those eastward to Portugal. This agreement did evade war for the moment, and remains one of the most celebrated treaties in European History. In addition to securing Portugal's claim to Brazil, the treaty affirmed Portugal's right to the eastward sea path to the Indies.

On coming to the Portuguese throne in 1495, the twenty-six-year-old King Manuel I was nicknamed "The Fortunate" because he inherited so many grand enterprises to come.



Tensions continued to flare and in 1520, both Portugal and Spain claimed the same territories in the east Pacific. In 1529, resulting in **The Treaty of Zaragoza.** The treaty did not modify or clarify the line of demarcation in the Treaty of Tordesillas, nor did it validate Spain's claim to equal hemispheres (180° each), **so the two lines divided the Earth into unequal portions, with Portugal getting the larger portion.**

Portugal's portion was roughly 191° whereas Spain's portion was roughly 169°.

Vasco da Gama (pp 175-178)

Under King Manuel I (The Fortunate)

Five years after Columbus' voyages, and following two years of preparation, Gama's fleet of four vessels sailed out of Lisbon harbor on July 8, 1497. The ships carried provisions for three years for some 170 men.

He reached Cape Town after being at sea for ninety-three days. From there, his skill in navigation, in managing his crew, and in dealing with the hostile Muslim rulers at Mozambique, Mombasa, and Malindi, finally took him and his fleet across the Arabian Sea and the Indian Ocean, to arrive at Calicut, his intended destination on the southwestern coast of the Indian peninsula on May 22, 1498. Until then, there had been no seafaring achievement of equal scope.

Not many heroes of discovery have the good luck themselves to enjoy the fruits of their discovery. Vasco da Gama was one. His voyage, which finally proved a feasible sea route between West and East, changed the course of both Western and Eastern history. **In February 1502 he set out again from Lisbon, this time with a Portuguese squadron to make Calicut into a Portuguese colony.**



Arriving off the Malabar coast, when he sighted a large boat carrying Muslim pilgrims home from Mecca, he demanded all the treasure on board. When the owners were slow to deliver, the result was recorded by one of his crew...

"We took a Mecca ship on board of which were 380 men and many women and children, and we took from it fully 12,000 ducats, and goods worth at least another 10,000. And we burned the ship and all the people on board with gunpowder, on the first day of October."



Boorstin p 177

On October 30, Gama, now off Calicut, ordered the Samuri to surrender, and demanded the expulsion of every Muslim from the city. When the Samuri temporized and sent envoys to negotiate peace, Gama replied without ambiguity. He seized a number of traders and fishermen whom he picked up casually in the harbor. He hanged them at once, then cut up their bodies, and tossed hands, feet, and heads into a boat, which he sent ashore with a message in Arabic suggesting that the Samuri use these pieces of his people to make himself a curry.

When Gama departed for Lisbon with his cargo of treasure, he left behind in Indian waters five ships commanded by his mother's brother, **the first permanent naval force stationed by Europeans in Asiatic waters.**

Da Gama left Calicut in August 1498. His expedition beat all expectations after he brought in cargo that was worth 60 times more than the cost of the expedition.



And that was just the beginning...

The next sequence of steps to establish an empire in India seemed as obvious as the stages down the west African coast.

The first Portuguese viceroy of India, Francisco de Almeida, destroyed the Muslim fleet in 1509. Afonso de Albuquerque, the next Portuguese governor of India, conquered Ormuz, the gateway to the Persian Gulf, in 1507, made Goa capital of the Portuguese possessions in 1510, took Malacca in 1511, and then opened sea trade with Siam, the Moluccas, or Spice Islands, and China. The Portuguese now ruled the Indian Ocean.

The consequences reached around the world. Much Italian splendor had been based on the wealth of the East pouring through Venice and Genoa. **Now the traffic in Asiatic treasure—spices, drugs, gems, and silks would no longer come through the Persian Gulf, the Red Sea and the Levant, but on Portuguese ships around the Cape of Good Hope to Atlantic-facing Europe.**

The Egyptian sultans had been able to keep the price of pepper high by keeping the consignments down to about two hundred and ten tons per year. So quickly was the effect of the Portuguese sea route felt that by 1503 the price of pepper in Lisbon was only one-fifth of what it was in Venice. **The Egyptian-Venetian trade was destroyed. The wealth of Asia, the fabled treasures of the Orient, were flowing west.**

The new Age of the Sea moved the trading posts and ports of commerce and civilization from the coasts of a finite body, the closed Mediterranean, the "Sea-in-the-Midst-of-the-Land," to the shores of the open Atlantic and the boundless world-reaching Oceans.

Historical Perspective: Henry versus Columbus

Henry's discoveries required a progressive, systematic, step-by-step national program for advances through the unknown.

Columbus' Enterprise of the Indies was a bold stroke, the significance of which would not be known for decades.

Henry's Portuguese voyagers were on a century-and-a-half enterprise, the actual meaning of which was imagined long in advance, the accomplishment of which was known immediately.

Columbus' greatest achievement was something he never even imagined, a by-product of his purposes, a consequence of unexpected facts.

Henry's achievement was the product of a clear purpose, which required heavy national support. Here was a grand prototype of modern exploration.

Historical Perspective: Feedback

The ability to come home again was essential if a people were to enrich, embellish, and enlighten themselves from far-off places.

In a later age this would be called **feedback**.

It was crucial to the discoverer, and helps explain why going to sea, why the opening of the oceans, would mark a grand epoch for humankind. In one after another human enterprise, the act without the feedback was of little consequence. **The capacity to enjoy and profit from feedback is a prime human power.** Seafaring ventures, and even their one-way success, were themselves of small consequence and left little record in history. Getting there was not enough.

The inter-nourishment of the peoples of the earth required the ability to get back, to return to the voyaging source and transform the stay-at-homes by the commodities and the knowledge that the voyagers had found over there.

Historical Perspective: First in the Mind, then explore...

In the perspective of history, it is not so surprising that the pioneer of modern exploration never himself (Prince Henry) went out on an exploring expedition. The great medieval adventure in Europe—crusading—called for risk of life and limb against the infidel.

Modern exploration had to be an adventure of the mind, a thrust of someone's imagination, before it became a worldwide adventure of seafaring.

The great modern adventure—exploring—first has to be undertaken in the brain. The pioneer explorer is one lonely man thinking.

Will it not be the same for space exploration?

Is there any reason to think that the nature of humanity and exploration has changed in a few hundred years?