

GEOGRAPHICAL EXPLORATION

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I INTRODUCTION

Geographical exploration, the process by which the earth and its features—primarily its physical, terrestrial features—have come to be known and recorded. Thinking of exploration often calls to mind intrepid voyagers setting sail for distant lands, but it is necessary to recall that unless such explorers return—and return able and willing to communicate the nature of the places they have encountered—their “exploration” failed. The roots of these terms offer clues for how to think about this subject: *geo-graphy*, or “earth-writing”; and *ex-ploration*, from the Latin words meaning “to tap, to make pour out.” Geographical exploration demands that an unfamiliar place be “tapped” (made to yield its secrets), and that these previously invisible, unknown qualities be recorded in some form of “earth-writing”—this might include stories, pictures, and, particularly, maps.

Several things follow from this definition. First, not all travel is geographical exploration. People migrate, they wander, they go far from their places of birth, sometimes in pursuit of better conditions, sometimes to hide, and in other cases on military or spiritual quests. Secret travel, travel in one direction, these do not meet our definition. Second, the very idea of geographical exploration implies some sort of “archive,” some way that what is known about the shape and character of the world can be collected and compared, taught and learned. To understand geographical exploration historically we need to think about how a given people, in a given age, organized and maintained their knowledge of the world.

Those now remembered as celebrated geographical explorers may not always have been the first humans to reach a particular place (in fact, they rarely were!) but they were almost always those who succeeded in getting their “earth-writing” into the archive of their day. That archive may have been a library, a royal court, or an association of experts back in the country from which the explorer came. As the archive changed, so did exploration. As the technologies of earth-writing became more precise—for instance, nineteenth-century maps that could indicate the position of a mountain very accurately with mathematical coordinates—new explorers could visit places previously explored, make new measurements, and achieve fame for what they added to what was known about the world.

Much confusion can be avoided by thinking of exploration in this way. Did Columbus discover America? In one way, he surely did not, for the Taino Native Americans had for centuries called his “discovery” home. But Columbus was very much a geographical explorer: his account of the islands he visited became a vital new bit of information that European map-makers had to fit onto their globes. His earth-writing became a crucial part of the archive of European maps and scholarship.

He did not (as far as we know) add anything to the archive of the Taino, who had their own ideas about the shape of the world, their own ideas about what was unknown, and their own ways of recording and transmitting this information. One old history book about exploration shows maps of the world in different ages. The earliest maps are nearly all blacked-out, with only a small area near Greece shown clearly. As the maps approach the present, the visible area grows—the darkness is lifted as additional parts of the world come to be explored. This sort of picture is fine—even helpful—as long as we remember that it is the history of *one* tradition of world knowledge, that of Europeans.

The earth-writing of many societies all over the world—the native peoples of Africa, the Pacific, the Americas, among others—is not well understood, and many of these traditions have been forgotten, and those who knew them are gone. Their traditions of exploration, their explorers (for they surely remembered those who had taught them about the world) will not appear in this article, which will tell the story of western, European explorers and their archive of geographical knowledge. In this sense, much of the history of geographical exploration remains to be discovered.

One last thing merits mention. In a short article like this, it will be necessary to focus on a relatively small number of the most famous geographical explorers in the European tradition. There were many others. A thoughtful reader should remember to ask: How do some explorers end up famous and others are not remembered? It is not always the most courageous or the farthest-ranging who become part of the “canon” of exploration. When historians speak of a “canon” they mean the traditional set of books and names that are used to tell a history. The story of who ends up in the canon is often complex: some explorers had powerful friends who helped them get particular recognition; some wrote well and became popular because people bought and read their books; some are remembered now because they were seen, after their death, to be important to the political or economic strength of a particular nation. This article will offer a canonical history of geographical exploration, a valuable story, but by no means the whole story.

II ANCIENT AND MEDIEVAL EXPLORATION

Records of the earliest geographical explorations in the European tradition are sparse: few names are known to scholars, and the earliest routes are difficult to reconstruct. In general, however, it is clear that trade, and particularly the pursuit of exotic objects, often pushed merchants and royal servants to go beyond their familiar circuits. In a few instances accounts—often recorded much later, and hence questionably reliable—of these travels survive. Maps as we know them do not seem to have been the primary archive of geographical knowledge until surprisingly late (perhaps not until the 14th century), so narratives, poems, and stories were used to tell people about the shape of their world.

A Ancient Eastern Mediterranean Explorers

European traditions are regularly traced back to the earliest civilizations in the eastern Mediterranean, particularly those of ancient Greece and Egypt.

A1 Egyptians

Tomb inscriptions provide evidence of the first few men who elected to be known to posterity as travelers who had expanded the horizons of their communities. Both the nobleman Harkhuf (circa 2300BCE) and Pyopi-nakht (probably contemporaneous) wished to have it known that they had led caravans up the Nile, in the direction of the African land of Nubia. A later and still more elaborate mortuary carving commemorating the Egyptian Queen Hatshepsut (circa 1500BCE) depicts a large expedition that she apparently commissioned to run down the Red Sea in the direction of the Horn of Africa. The link between the Nile and the Red Sea was shown on a papyrus map that can be dated to the period of the Ramses pharaohs, several centuries later.

A2 Phoenicians

A people adept in sailing the coastal trade in the Mediterranean, the Phoenicians established colonies at some distance from their original homeland of Tyre, which lay at the easternmost edge of that sea. One chronicle suggests that Phoenician sailors, on the order of an Egyptian ruler, may have circumnavigated the continent of Africa around 600BCE. The feat seems incredible, given that it was not to be repeated (as far as is known) until nearly 2000 years later. At the same time, working close to the coast, putting ashore for considerable periods to resupply, such an expedition is not totally impossible.

If it did happen, it did not make a contribution to later Greek ideas about geography, as the Arabian Sea was long depicted as sealed to the south by an extension of Africa that made a bridge to southern Asia. Going “around” Africa to the south was thus considered impossible. The Phoenicians did set up trading posts slightly outside the Strait of Gibraltar by the 7th century BCE, and this lends plausibility to an account of a trader named Himlico who in the 5th century BCE is supposed to have sailed north to the northeast corner of France in search of tin mines.

A3 Greeks

Few ages or peoples have had a greater impact on the history of Europe than the civilization of the ancient Greeks. Their achievements in architecture, literature, sculpture, philosophy and science set benchmarks that not only influenced later practitioners in these areas, but which gained a nearly sacred status among scholars and learned people in Europe much after the twilight of Greek power. The geographical thinking of Greece shaped how Europeans saw their world two millennia later.

Little of geographical precision can be said about the legendary wanderings of the greatest Greek traveler of all, Odysseus, whose Mediterranean meanderings are the subject of Homer's celebrated poem. Many classical scholars have turned their hand to "mapping" his mythic journey, but there is no evidence Greeks did the same. Firmer evidence can be offered for the substantial circuit of the Greek admiral, Scylax of Caryanda, who in the late 6th century BCE, at the behest of the Persian ruler Darius, took charge of an expedition from Asia Minor, down the Indus river, and then along the southern coast of Arabia, apparently making his way back to the Eastern Mediterranean via the Red Sea.

A similar route was taken about 200 years later by the Greek ruler Alexander the Great, one of the most remarkable figures in history. Succeeding his father as king of Macedonia (northern Greece) in 336 BCE at the tender age of twenty, Alexander proceeded to leave an indelible mark on the world in the twelve years of his rule. In that time he led troops through Asia Minor (modern Turkey), south through the Levant to Egypt, and then all the way across Persia to the Hindu Kush, the northern and westernmost portion of the Himalaya range. It was a journey of some 20,000 miles.

Conquering as they went, Alexander and his men won for Greece a vast (and loose) eastern empire. It is often noted that young Alexander received lessons from a still more famous Macedonian, the philosopher Aristotle. From Aristotle's works it becomes possible to make some guesses about the geographical ideas Alexander took with him as he headed east. For instance, Aristotle appears to have taught Alexander that a large sea bounded Asia to the east, just as a large sea bounded the known world to the west. This idea—of a world bounded by water, with a certain balance to the configuration of the continents—seems to be a product of geographical theory more than direct observation.

Alexander's campaign was at least in part responsible for a considerable expansion of the Greek world-view. In addition to a variety of doctors, zoologists, and scribes, Alexander brought with him two "measuring men," or *bematistai*, who were responsible for maintaining records of the progress of the army. Their itineraries (now lost) likely included sketch maps, particularly of roads and forts. In addition, on his return trip Alexander commissioned one of his officers, Nearchus, to descend the Indus, and to go by ship along the coast, a portion of the voyage reputedly undertaken by Scylax, who appears not to have been known to Alexander and his men.

Alexander's expedition was a military one, and the lay of the land was incidental to his primary goal of conquering the Persians and extending Greek hegemony. Nevertheless, the records of his foray to the east yielded a considerable amount of geographical information that appeared on later maps made in the Greek world.

What was known of the world to the west of the Mediterranean came not from a military man, but from a navigator and astronomer named Pytheas, who was a native of Marseilles, in what is now southern France. At about the same time as Alexander headed east, Pytheas traveled beyond the Strait of Gibraltar, most probably on ships plying an Atlantic trade in metals and amber. His interest in astronomy led him to link observations of the changing length of the day to his measurements of local latitude, which resulted in his speculation on the spherical form of the earth. So improbable were his stories of endless days and ice islands that a number of classical authors appear to have mistrusted his work.

Of all Alexander's triumphs, one of his most impressive legacies was the city he founded in Egypt, and to which he gave his name. In the Hellenistic period Alexandria, and particularly its library, became a renowned center of learning. It was here that Euclid's school of geometry had its home, and here too that such geographical scholars as Eratosthenes, Hipparchus, Strabo, and Ptolemy conducted their researches. It was the last of these who was to define how learned Europeans understood the world for centuries.

Ptolemy's *Geographia* incorporated the theoretical observations about the shape and size of the earth made by his predecessors, and collated these with a gazeteer, an exhaustive list of locations for cities throughout the known world. In addition, this work included maps and information on making them. [FIGURE] Men like Columbus, 1400 years later, would study what they learned of geography from copies of Ptolemy. The explorations of the "Age of Discovery" would need to be fitted together with the world this Greek author defined.

B The Vikings

That the Nordic peoples of Norway and Sweden were prolific travelers we can be sure: between the 8th and the 10th centuries CE, the Vikings not only penetrated modern Russia and made their way into Georgia and the Caspian Sea, they also appeared (to trade, to raid) in nearly every coastal region of Europe. Moreover, recent work confirms that they founded colonies on Iceland, Greenland, and part of Newfoundland in modern Canada. This made them the first voyagers to cross the Atlantic Ocean. However, it is archaeology that proves this, along with suggestive passages in several Norse chronicles. On the geographical conceptions of these hardy travelers, essentially nothing is known. A few names—Bjorn Ironside, Erik the Red, Leif and Thorvald Erikson—are attached to particular voyages, but if the Vikings had their own cartographic traditions, they must have been separate from those of the Greeks, and they are now lost.

One story of Viking exploration deserves mention, as it serves as a lesson in how the canon of geographical exploration gets made and changed. In 1898, in modern Minnesota, a Swedish immigrant found a stone in his woods that bore an inscription. Deciphered by scholars, it seemed to record a visit by a group of Norsemen in 1362, long before Columbus. This would have been an amazing artifact, evidence of Viking penetration deep into North America. It is now clear that the stone was a fake, made up and “found” as part of an elaborate effort to boost the pride of Nordic peoples, and perhaps to suggest a more Aryan founder for the Americas. During the late 19th century there were many who argued that northern Europeans were superior to those in the south, and this “discovery” would have helped their claims. In addition, it just happens that the U.S. was in a war with Spain at the time the inscription turned up, a war over the Caribbean, and the islands Columbus had claimed for the Spanish Crown. A claim about geographical exploration, then, was also a patriotic fib that weakened Spanish claims on the Caribbean by taking the focus away from Columbus.

C Traders and Missionaries

The story of the silk road shows very clearly how few records we have of the earliest people to make extraordinary expeditions. China lies at the easternmost edge of Asia, tens of thousands of miles from Europe, much of this route through dry, mountainous, and inhospitable terrain. Yet it is almost certain that some sort of trade was conducted across this route from as early as the first century CE. Silk probably dominated the exchange, as European nobles considered it the finest display of refined wealth but had no idea how it was made. Other trade goods likely included spices, corals, precious stones, and porcelain. These trading caravans must have trekked for months to cross Asia, and they did so—back and forth—for hundreds of years. Not a single name or precise record of such a caravan journey has made it into the canon of geographical exploration; these were likely not literate men and women who made these extraordinary trips; if they made maps they were scratched in the sand or modeled in wet clay. They do not survive.

For the route to Asia to become part of the European geographical archive demanded that someone take that journey and write or draw it. In the middle of the 13th century a number of clerics headed east—Giovanni del Carpini in particular—on commissions from the Pope, who was curious to learn more about rumors of Christian communities living in central Asia. In addition, European rulers hoped to find in the court of the Mongols (the dominant power across Asia) allies in their on-going confrontation with Islam. Carpini’s written account details his expedition to the court of the Great Khan at Quaraquorum, in modern Mongolia. A number of other envoys followed.

The written account that became most crucial in influencing European ideas of what lay to the east was the *Description of the World* of Marco Polo, a Venetian born into a family already deeply involved in the eastern trade. Polo claimed to have become a confidant of Kublai Khan, to have reached Xanadu and the Eastern Sea, and to have returned by boat across the Indian Ocean

during nearly 25 years of travel; he returned in 1295. Just how far east Polo actually went is difficult to say, but what is certain is that the story he left—narrated to a fellow prisoner during Polo’s last years in a jail in Genoa—became a primary source for geographers wishing to fill in the land to the east, a land Polo called “Cathay.” Neither Polo, nor his ghost author appears to have used maps to plot the journey, but over the next century a number of celebrated maps were composed that made extensive use of the place names and geographical clues presented in the *Description of the World*. Examples include the Catalan Atlas of 1375 (prepared for the King of France by Abraham Cresques) [FIGURE], and the later Fra Mauro map from 15th century Venice [FIGURE].

D Non-European Explorers

While it is impossible to do justice to the many explorers and geographical traditions outside of Europe, a few expeditions undertaken by men outside the Christian world were so extraordinary that their renown has made them a part of the canon. They will be mentioned here.

D1 Arabs

Islam, the religion that arose on the eastern shore of the Red Sea in the early 7th century, had, by the early middle ages, spread from Spain to Indonesia. Concern for geography and travel was in certain ways built into the very fabric of this spiritual movement, which had its origin within a community of long-distance traders. In the first place, prayer focused on a certain place, the city of Mecca, meaning that Muslim communities required geographical expertise in order to ensure that their places and manner of worship were oriented correctly. Second, one of the fundamental requirements of the faith was a pilgrimage to Mecca itself.

Islamic contributions to the European tradition in the sciences have often been overlooked, but during a considerable period, while Greek learning had been shelved or forgotten in European courts and monasteries, Islamic scholars translated, preserved, and embellished the scientific works of classical Greece. The gazeteers prepared in Baghdad in the 11th century surpassed anything available in Western Europe, and the 12th century world map of Al-Idrisi (in 70 sections!) reflected a detailed and systematic approach to world geography.

Learned in these traditions, a young man from Tangiers set out to make his pilgrimage to Mecca in 1325. Over the next 30 years he completed the most remarkable set of journeys recorded by any man in pre-modern history—perhaps 75,000 miles. In addition to North Africa, Ibn Battuta crossed Arabia, visited east Africa and made the long journey north into Asia and then across the Indian ocean, reaching, by his own account, not only India, but China as well. His *Travels*, composed after his return to Tangiers, served as an embracing chronicle of the Muslim world. At the same time, it is a testimony to the advanced state of Islamic geography that his great travels

added little to the cartography of the period; the regions he visited were, for the most part, already placed within the geographical archive of Muslim scholars.

D2 Chinese

A single question has long puzzled western scholars interested in the history of science and the rise of Europe as a global power from the 16th century forward: namely, how did it happen that China—so well endowed with stable political and social systems, so adept with valuable technical expertise—did not outstrip the West in scientific advances and global power? It is, in some ways, a funny question, as it is hard to tell the history of things that did not happen. But the question itself reflects just how remarkable Chinese learning and political culture were when compared to 13th century Europe, or even to the “golden age” of Islam.

The Chinese possessed an extensive geographical archive—their own administrative maps, detailed cosmographies, and precise astronomical instruments and records. Nor were they unskilled in maritime travel. Rather, it was Europeans who learned critical naval technologies—the magnetic compass, the stern-post rudder—from the Chinese, not to mention gunpowder, another innovation that came from the East but that would be perfected and deployed to devastating effect by Europeans in their efforts to colonize distant lands.

One way that this lingering question has been answered is to suggest that China was so well placed that it became, somehow, “closed.” Needing little from the outside world, China ceased to look abroad, and in so doing cut itself off from the growing web of trade links that bound the peoples of Eurasia. Often given as evidence of this story are the journeys of the great Chinese admiral Zheng Ho, who, over nearly 30 years at the opening of the 14th century conducted multiple expeditions by sea throughout the South China Sea, around the Malay peninsula into the Bay of Bengal, and from there around the tip of India all the way to the Persian gulf. Other ships from his party pushed into the Red Sea and even down the coast of east Africa. These were extensive voyages, conducted less in the spirit of trade than of reconnaissance—collecting, examining, conquering and exacting tribute when possible.

For all that, the expeditions are remembered as a hint of what might have been. For, returning to China, Zheng Ho found a changed dynasty, one not sympathetic to expansion or extensive contact with the world beyond China’s own shores. Zheng Ho’s geographical explorations found their way into the charts produced in China in the early 17th century, and his name joined the ranks of the great explorers, but China did not reach west again.

III EUROPE'S "AGE OF DISCOVERY"

We take spices for granted, but imagine that you could trade a small bag of nutmegs for a team of oxen and all their fittings, the 15th century equivalent of shining, overpowered 18-wheeler. Such rates of exchange were not unheard of in Europe in the late middle ages. The reason, of course, is that such exotic substances as pepper, cloves, and cinnamon grew only in places far away and difficult to reach—the East coast of Africa, the shores of India, the islands of Indonesia. Trade routes were slow and dangerous, and each port of call meant taxes levied on passing goods.

A new and faster route to the East promised tremendous riches. Mariners, navigators, princes, geographers, and merchants schemed and dreamed for several centuries in the hopes of cashing in on the eastern trade. In the process, the traditional European images of the world—inherited from Ptolemy, influenced by Christian symbolism—had to be stretched and refigured. The world was proving much larger than anyone had suspected, but, equipped with larger ships and new navigational tools, European sailors were seeking to tap its distant zones.

A Portuguese Voyages Down the African Coast

From 1416 to the early 16th century, a series of Portuguese expeditions set out from Lisbon and pushed their way South along the western coast of Africa. The aim of these naval voyages has been disputed—were they prompted by enlightened curiosity or primitive greed?—but their effect can be stated with certainty: by 1488 a Portuguese captain, Bartholomew Dias, had rounded the southern tip of Africa and sailed into the Indian Ocean. Within a decade Portuguese military/commercial expeditions would, under the leadership of Vasco da Gama, sail not only around the Cape of Africa, but up the east coast and across the sea to India. A new sea route to the east had been found.

One stimulus to this southern push was the Portuguese King, Don Henrique, sometimes called Henry the Navigator (1394-1460). He sponsored the expeditions that located the Canary Islands (off the coast of modern Morocco), as well as those that reached around the edge of western Africa into the Gulf of Guinea and beyond. Historians have probably over-emphasized Henry's "scientific spirit" and the Renaissance energy that supposedly drove these expeditions. Their purpose was trade, and conquest where possible; capturing slaves happened too. There was also a good deal of interest in seeing whether any Christians lay to the south of the Muslim regions of North Africa. As Christians considered "the infidels" their sworn enemies (and vice versa), rumors about a Christian prince named "Prester John," who might provide an ally both in trade and war, attracted much attention.

Prester John turned out to be wishful thinking, but through the naval and military successes of Francisco de Almeida and Alfonso d'Albuquerque, the Portuguese held fortress trading ports not

only in India (at Goa) but as far east as Malacca by 1511. Portugal had not only reached the east, but had dug in and claimed an empire. In the process, one of the central tenets of Ptolemaic geography had to be cast aside—that the Indian Ocean was bounded by land to the south. Africa's coast had been charted in close detail. [FIGURE The Martellus map of 1490, and the Cantino map of 1502]

B Columbus

Plenty of educated people think that before Columbus, European scholars believed the world was flat. This is wrong. We have seen that the Greeks, more than 1000 years before, detailed the shape and size of the globe. In addition, Columbus himself read widely in the geographical texts he could find—Strabo, Ptolemy, even Marco Polo—and annotated their margins as he puzzled over just how big the western ocean was. Having been resident in Lisbon during a period of intensive Portuguese expeditions down the coast of Africa—and aware that a new route had been opened to the east around the cape—Columbus began to ponder whether it would not be faster simply to sail for Cathay (China) and Cipangu (Japan) by going due west out the Straits of Gibraltar, going west to get east.

The idea was not entirely new. A much-loved 14th century story of travel and adventure, the *Travels* of John Mandeville, told just such a tale of an explorer who went so far in one direction that he came back again to the borders of his own country. Columbus surely knew Mandeville, and he may even have thought that it was a true story. Scholars now agree that Mandeville's *Travels* were the work of an energetic and learned gentleman with a vivid imagination.

To suggest it could be done was one thing, to do it was quite another. Increasingly persuaded that the smaller estimates of the earth's size were right, and encouraged by a number of scholars who had worked on translations and new editions of Ptolemy, Columbus began to look for the sponsorship he would need to undertake what he hoped would be a thirty-day voyage to China, across the Atlantic. The Spanish court provided him with ships, men, and provisions, and he set out from Palos, on the southern coast of Spain, on the 3rd of August 1492. It was a grueling passage, and Columbus ultimately resorted to subterfuge to calm a crew at the edge of mutiny after more than two months of sailing out of sight of land. Then, on Thursday the 11th of October, Columbus and his men spied green on the horizon.

Where did Columbus think he was? He thought he was somewhere in the vicinity of the Great Khan, somewhere near the markets of China and Japan. Where was he in reality? There has been much dispute about the precise island where Columbus and his men went ashore, but it is almost certain that he was somewhere in what are now called the Bahamas. [For a discussion of different theories, as well as accounts of Columbus's techniques for navigation see <http://www1.minn.net/~keithp/>] There was a vast continent and then another vast ocean between him and the Khan. Columbus had stumbled on what was, for Europeans, a new world.

That was not so clear at first. Columbus would make three more voyages to the Antilles between 1493 and 1504, coasting the shores of the islands of Cuba, Hispanola and Puerto Rico, and on his third voyage, touching the shores of South America near Trinidad and modern Venezuela. Later he would reach the coasts of Central America near modern Honduras and coast down to Panama. He would die declaring that he had opened a new route to the traditional trading zones of the east. Others had their doubts. For all the appeal of these “Indies,” other European navigators who reached them within Columbus’s lifetime—Amerigo Vespucci, Vicente Pinzòn—found little evidence that they were anywhere near the empire of the Great Khan. No one they met seemed to know any of the expected languages, or recognize any of the place names that the sailors yelled in increasing frustration: no one pointed knowingly when one asked for the Moluccas, the famed “Spice Islands” of the East. Columbus’s insistence began to look a little suspicious. After all, his arrangement with Ferdinand and Isabella stipulated that he had to reach Cathay to receive his reward. Once he had that money in hand he would have been unwise to change his tune.

Close to Pope Alexander VI, the Spanish Crown secured a very favorable ruling about how possessions to the west were to be divided between Spain and her rival, Portugal. A north-south line was imagined bisecting the Atlantic: to the west lay Spanish territory, to the east, that of Portugal. Given the very unreliable technologies for finding longitude at sea (east-west distances), the actual position of the line was a subject of dispute for more than a century.

In 1500, the Portuguese captain Pedro Cabral, swinging far to the west in preparation for rounding the cape of Africa, came upon land—he had struck the east coast of Brazil. Added to the landfalls to the north, Cabral’s discovery made it seem even more likely that there was quite a bit of land between the Atlantic and China. The efforts made by geographers to incorporate these landfalls into their world maps betray the uncertainty that attended these discoveries: Were the Islands of the Antilles merely an archipelago near Japan (as Contarini suggested in 1506 [FIGURE])? Or was there much more (as Waldseemüller seems to suggest in 1507 [FIGURE])?

C Early Exploration of the “New World”

It appears Columbus made no maps of his journeys. Or, if he did, they were treated as secret (and valuable) documents, and have not survived. Cartographers like Waldseemüller learned much more of the lands to the west from the narratives of Amerigo Vespucci, who published accounts of four voyages across the Atlantic, probably only two of which (1499-1500) were real. This greater reach of Amerigo’s writing led Waldseemüller to give the emerging form of a new continent the name “America.”

The best efforts at secrecy were bound to fail; common sailors could not be silenced, and they were a mobile bunch. Word spread quickly. In 1497 John Cabot—from Genoa originally, but sailing from England—reached Newfoundland, the same region visited by the Vikings more than

500 years before, of whom no memory remained. A series of expeditions charted the coast of North America in the early years of the 16th century—Giovanni da Verazzano (for the French), Gaspar and Miguel Corte Real and Esteban Gòmez (for the Spanish). In most of these cases the aim was less to map North America than to find a way to get through or around it. There was little sense of the expanse of territory that lay to the west. In 1524 Verazzano believed he had spotted the extension of the sea that would lead to China. He had seen what we call Pamlico Sound, lying behind some barrier islands. The whole of a continent lay ahead.

In 1513 Vasco Nuñez de Balboa was the first to see the other side in earnest. One of the growing number of Spanish men-of-fortune who had made their way to the new Spanish colonies in the Caribbean in search of land and wealth, Balboa made his way into the interior of Central America in the company of a group of Amerindians. In the process he crossed the isthmus of Darien, and became the first European to see the Pacific ocean. The product of this and a number of other Spanish expeditions in the Gulf of Mexico (including that of Ponce de León around modern Florida, also in 1513) was an increasing recognition that no easy way to China would be possible sailing West from Europe. In the meantime, Spanish colonization and conquest began to gather momentum. New continents had come into focus on the world map.

D Magellan and the Circumnavigation

For proof of just how hard it would be to reach the spice-rich East Indies by sailing west, Europe would have to wait no longer than 1522, when a bedraggled group of 18 men reached Seville, having completed the most remarkable sea voyage of their age. They were all that remained of a set of five ships and several hundred men that had set sail three years earlier to succeed where Columbus had, in a way, failed—under the leadership of Ferdinand Magellan, they were to reach the East by sailing west. The magnitude of the Pacific had been established at considerable human cost.

One of the casualties was Magellan himself. After leading his little flotilla down the eastern coast of South America, Magellan succeeded in negotiating the dangerous strait that now bears his name, and which runs between the southernmost tip of the Americas and the island of Tierra Del Fuego. He survived, too, the savage 98-days out of sight of land that welcomed Europeans to navigation in the vast Pacific. Many men died of scurvy and other forms of malnutrition. Magellan fell after the crossing was complete, killed in a skirmish with the native people of the Philippines. The completion of the voyage—down through the East Indies and across the Indian Ocean, around the Cape of Africa and back up to Spain—was completed by his officer, Juan Sebastián Del Cano in the *Victoria*.

Several subsequent attempts to circumnavigate the globe failed, and increased the mystique attached to that of Magellan's men; the Englishman Sir Francis Drake would succeed, more than 50 years later. Several world charts commemorated Magellan's voyage, and suggested the newly-discovered extent of the earth's seas [Ribero's world Chart of 1529 FIGURE], but with no certain way to measure longitude at sea, much difference of opinion remained over the precise size of the Pacific.

This made a difference in several ways. First, Spain and Portugal continued to dispute the extent of their empires. That line drawn by the Pope in the western hemisphere supposedly continued around the globe, dividing the eastern hemisphere too. Where? No one could say exactly, but both sides hoped (and claimed) that they had the valuable spice islands called the Moluccas. Magellan himself got Spanish support for his voyage by claiming that the Moluccas lay in the Spanish sphere. He had earlier visited them, however, when sailing under a Portuguese flag! Second, uncertainty about the size of the Pacific continued to draw explorers to look for an easy way to the East Indies through or across the Americas, the subject of the next section.

E The Northwest Passage

Spanish and Portuguese control over the southern routes to the East Indies placed pressure on the countries of northern Europe to find another way. Better accustomed to the frigid waters and sea ice of the North Atlantic, the English led a number of these expeditions to look for a "Northwest Passage." The earliest of these journeys were those directed by Martin Frobisher in 1576 and again in 1578. Nosing about at the North end of Labrador, Frobisher found a number of promising seaways that he reported would likely continue on to Cathay. One, it later turned out, was a medium-sized bay on Baffin Island; the other was the strait that led to Hudson Bay.

But it took Henry Hudson's voyage of 1610 to pass into this large body of water, and to give it a name on European maps. Hudson was on his second season of cruising off North America, having been disappointed the year before when a large river on the eastern coast petered to the north, and failed to turn west and span the continent. The river now known as the Hudson would never be a highway to Cathay. The voyages of John Davis between 1585-87 had likewise turned up no evidence of an easy route around the top of North America. The promise died hard, however, in part because of the many waterways that laced the northeastern portions of modern Canada. It is always hard to prove a negative, particularly among optimists.

Thomas James followed Hudson's route into the bay in 1631, and he and his men traced its western edge and passed a difficult winter under heavy ice and snow. But for all his protestations—he thought that no passage could be found in a latitude warm enough to be free of ice for a convenient portion of the year—others followed him. It is worth noting that English sailors in the mid 16th century (Sir Hugh Willoughby, Richard Chancellor) had sought a

Northeast passage, around the top of what is now Russia. While these routes helped opened trade in furs and other commodities, the project of reaching China that way froze in the Siberian ice.

F Sea Explorers

The 16th and early 17th century saw a number of other significant expeditions that continued to shape European geographical understanding. A series of Spanish naval journeys up the west coast of Mexico to California demonstrated conclusively the magnitude of the Americas, though considerable confusion arose about whether California itself (or what we now call Baja) was a peninsula or an island. In 1565 André de Urdaneta, a Spanish monk, succeeded in captaining the first west-east crossing of the Pacific, a trip that linked the Philippines with Mexico, and greatly extended Spain's trading network in the Pacific.

Other Spanish expeditions looped through the Pacific in the late 16th century, noting encounters with many of the island people of Polynesia and Melanesia. Declarations of Spanish sovereignty were made, and names given to these islands, but they drifted about on contemporary maps, as their small size and abundance led to confusion among European geographers. Navigators themselves, without reliable techniques for establishing their position, could seldom specify the location of a new island discovery with enough precision to ensure that it could be found again.

The early decades of the 17th century were also a period of considerable Dutch ascendancy in the East Indies. Dutch control over a strategically placed base on the western end of the island of Java from 1619 forward signaled an extension of Dutch trading power in the region. It was in this period that a number of Dutch sailors, overshooting their marks, sighted land to the south, the western coast of Australia. By 1627 Dutch ships had coasted from the Cape York peninsula all the way to the Nuyts Archipelago, and in the early 1640s Abel Tasman rounded the eastern end of Australia from the south. He stayed far enough off shore that he did not see the eastern coast, but he did chart "Van Diemen's Land," or modern Tasmania, and he noted the western edge of New Zealand as well.

IV EXPLORATION AND EXPLOITATION IN THE AMERICAS

Reconstructing the violence, heroism and tragedy that attended European territorial colonization of the Americas is no small task. There are many different questions one would like to have answered: Why did Europeans so often feel that it was their right to displace (and often kill) indigenous inhabitants of these lands? What made it possible for them to do so? What did this encounter look like to those who were defeated, and whose memories and perspective have been

largely lost? These are the weighty questions pursued by those who think seriously about the conquest of the new world.

Of some things we can be certain: money was consistently near the top of motivations for those who arrived in the Americas, regardless of how much talk there was of converting the heathen, and serving the Lord. The organized and wealthy civilizations of the Aztec and the Inca (in Central and South America respectively) yielded up gold and silver in staggering quantities, a hoard of treasure so great that it changed the shape of European banking and finance and made Spain the richest court in Europe. Later plantation systems allowed for a slower production of wealth, and gave rise to an intricate (and inhumane) trade in slaves. In the northern regions furs were a precious commodity. Everywhere both technology and disease played significant roles in the encounter.

Geographical exploration is just one small part of this vast story. The *conquistadores*, navigators and explorers who added to geographical understanding of the Americas were almost always involved in the broader colonial projects in one way or another. Sometimes they were themselves military men, in other cases they were sponsored by companies seeking information about resources and trade goods deeper in the interior. In almost every case (particularly in North America), it is worth remembering that the named explorers in the canon were very often preceded by unnamed explorers who were simply going about their business—trading, fighting, etc.—and who did not have the ability or the leisure to write of their exploits. The writing and mapping and picturing of the Americas served not only to consolidate European territorial claims, but also to communicate something of this distant place to the courts, scholars and readers of Europe. In this sense “America” as it was known to its conquerors took shape as it was mapped and described.

A Spanish Conquest

Hernán Cortés hardly merits mention in the annals of geographical exploration. His three-year expedition from Veracruz to Tenochtitlán covered less than 250 kilometers, and Cortés himself had relatively little interest in systematic cartography. He was a military commander with a volatile band of 600 soldiers of fortune. Their aim was the conquest of the Aztec empire.

In this they succeeded, and Spain became the most powerful military presence in Mexico from 1521 forward, but little was added to the European map of the world as a result. The consolidation of the territory of “New Spain” and its depiction in maps became a major initiative later in the 16th century, and led to a failed project to create a synthetic map of the region out of the collation of a set of local cartographic sketches. The story of this enterprise, the *Relaciones Geográficas*, is a wonderful testimony to how difficult it could be to maintain a geographical archive. As responsibility for mapping different regions was assigned to different local officials, who in turn assigned the painting of them to native assistants, the maps could not be fitted

together. They remain, however a fascinating visual source for the history of the period. [FIGURE].

The other most celebrated Spanish *conquistador*, Francisco Pizarro, belongs in the same category as Cortés. He too was a military commander, most interested in reaching and defeating the Inca in his capital of Cuzco, in Peru. His success in this endeavor, however, had a number of lasting effects for the history of geographical exploration in South America. In the first place, Spanish military reconnaissance of the extensive network of Inca roads lacing the western coast of South America led to an increasingly detailed understanding of the shape of that coast. Second, a subsequent expedition led by Francisco's brother Gonzalo penetrated from Quito to Iquitos in the early 1540s, a town on the upper reaches of the Amazon.

As a result of some confusion—or perhaps a defection—one of Gonzalo's officers, Francesco de Orellana, ended up splitting off from Gonzalo's force with a small band of his own. They would become the first known Europeans to descend the Amazon to its mouth, eventually making their way back up the coast toward Trinidad, a journey of some 5,500 kilometers. This was a desperate route, and no one was keeping a detailed log or sketching maps, but the story captured many imaginations, and the squiggle of the Amazon was extended on most European maps, reaching the eastern escarpment of the northern Andes.

The final way that Pizarro's conquests affected European exploration of South America was linked to the riches he found. The silver mines of the Inca rivaled any source of precious metals known, and the rumor that a "lost Inca," an escapee of Pizarro's bloodshed, might have made his way down the Amazon and settled in the interior gave rise to the legend of *El Dorado*, a story that compelled explorers to push into the jungles of South America for centuries. No hidden golden kingdom was ever found, but the tale of *El Dorado* became one of the most celebrated myths of exploration, driving men like Sir Walter Raleigh to great (and ultimately fatal) exploits.

B Exploration of North America

This section will offer a resume of the major patterns and most celebrated expeditions of North American exploration. As in other cases, the coasts of the continents were charted considerably in advance of any substantial reconnaissance in the interior, simply because of the greater safety and ease involved in running along unfamiliar coasts in a familiar ship, different indeed from the slow and dangerous passage up rivers and across land.

In general, North American geographical exploration can be divided both spatially and nationally, and there is considerable overlap in these categories: The Spanish pushed into the southeast and the southwest of the continent from their established colonies in New Spain (Mexico) and the islands of the Caribbean. French explorers had their strongest base of operations in the far northeast, where both missionaries and fur traders had established a considerable network of

alliances with Native Americans. English exploration, like English colonization, focused on the eastern seaboard, and only gradually pushed over the Allegheny mountains. Conflict, particularly between the French and the English, came to a head in the 18th century, by the end of which the United States were a separate country.

Not only was interior exploration more dangerous than maritime voyages of discovery, it depended to a much greater degree on an explorer's ability to negotiate some working relationship with local inhabitants of the regions through which he and his men passed. No man could carry food to support himself for more than a few days—even with a mule to help. Hunting could supplement provisions, but trade (or stealing) was almost always necessary. Moreover, explorers on land required detailed knowledge of the lay of the land ahead. All this meant that securing guides was essential. These individuals often had links of one sort or another with several different communities—they were of mixed parentage, for instance, or had been raised in the region, despite coming from elsewhere. Almost without fail, these guides decided the fate of interior explorers, though, in their narratives explorers had a tendency to write of guides as if they were simple servants.

If we remain conscious of the way that European geographical explorers almost always relied on individuals, networks and alliances that preceded them, we will not only have a clearer understanding of how most exploration really worked, we will also be able to see the real task of the geographical explorer: to go to a place, collect the local knowledge of its inhabitants, record it, and carry it to the archives of European geography.

B1 Spanish

Around the middle of the 16th century an interesting change occurs in European maps of the new world: a new set of maps appears that focus on depicting North and South America together, centered in frame of the map. This represented a departure from maps that had shown Europe and the Atlantic with a little edge of the Americas peeking in at the left edge of the page, or others that depicted the islands of the Caribbean. This new focus on the Americas—reflected in their being placed on “center stage” in these maps—was at least in part a product of the inland expeditions of Spaniards in the first half of the 16th century.

Few of these were as dramatic as that of Álvaro Núñez Cabeza de Vaca, who set out by sea with a large company to investigate the North American coast of the Gulf of Mexico. After coming ashore in Florida, and marching along a section of the coast, the men built small ships and continued by sea, coasting past the mouth of the Mississippi. Explorers often used the size, color, and temperature of river mouths to guess the size of the land through which they ran. North America suddenly seemed very large indeed.

The expedition unraveled on the shores of modern Texas, where, harried by the attacks of Native Americans, the party dwindled, and eventually the survivors (among them Cabeza de Vaca himself) were taken as prisoners. The story of their wanderings through Texas and the across the Rio Grande—their full journey took from 1528-1536—makes a remarkable read to this day. They found their way back into New Spain after being discovered by Spanish slave raiders in the southwest, good evidence that where explorers went they were seldom really beyond the reach of other forms of exploratory commerce, carried on by people who are now forgotten.

Following a similar route at first, the brutal expedition of Hernando de Soto reached farther north, into modern Georgia, Alabama, Mississippi, Arkansas and Louisiana from 1539-1543. De Soto tortured information out of the Native Americans he was able to capture, but his plan to bring this vast region under direct Spanish authority failed.

Like many a survivor, Cabeza de Vaca told some remarkable stories about the lands he had traversed as a slave of his captors in the dry Piñon forests of the American southwest. He was at least in part responsible for intensified rumors concerning the “Seven Cities of Cibola,” imperial fortresses which began to appear on the maps of the southwest region in this period. It is interesting to speculate as to why the Spaniards seem so often to have imagined cities in the regions they sought to conquer, places like Cibola and *El Dorado*. In one sense cities promised wealth. Thus the Spaniards kept re-playing in their minds the earliest conquests in the new world—those of Cortés and Pizarro. At the same time, cities lay at the hubs of empires, and this meant that the infrastructure of political control—agriculture, water, transportation—would be found already established. Conquering such a city meant controlling the region. By contrast, the highly mobile and dispersed peoples of North America (like those of the Amazon) proved nearly impossible to “conquer” in any rapid, dramatic way. They could simply move, sniping as they went. The dream of cities was a dream of ready-made imperial control.

It was this promise, as much as anything, that drew one of the explorers who survived with Cabeza de Vaca, an African known only as Esteban, to join with an expedition back up into the southwest in 1539. They reached Zuni villages where Esteban was eventually killed, and the expedition dispersed. The same region saw a number of other explorers—Francisco Vázquez de Coronado and García López de Cárdenas—in the early 1540s. One result of these expeditions was the first European view of the astounding topography of the Grand Canyon.

B2 French

European penetration of the northern parts of North America was, on the whole, a full century behind the Spanish incursions to the south. This reflected the later development of French and British colonial bases on the northeast seaboard, but ice-cold winters played a role too in discouraging long inland expeditions.

The voyages of Jacques Cartier in 1534 and 1535-1536 established that the St. Lawrence river was a means to reach the inner regions of the northern continent, but little incentive drew French and Dutch explorers to follow the route. Large numbers of ships from a variety of countries plied the waters off North America in the later 16th century, but their goal was fish—primarily cod—and so they made increasingly accurate local charts of the coastline and maritime hazards, without much concern for the interior. When the region was not marked “terra incognita” on contemporary maps it was called the *Terra de Baccalos*—Land of the Cod—something of a contradiction in terms! As in the case of *El Dorado* in South America, a paradisaical mythology was invented for North America too, and rumors of an inland empire—*Norumbega*—played a key role in shaping how geographers and literate Europeans imagined the regions out of sight of the coast.

Not until the expeditions of Samuel de Champlain (1604-1607 and 1608-1616), a skilled cartographer in his own right, did the extent of the fresh-water system now called the Great Lakes start to be apparent. Relations with the Native American tribes in the region constituted the single most important factor as the French sought to extend their trading networks for fur deeper into the region. Fur drew traders and trappers to establish more intricate alliances, but the renewed idea that all this water might lead to China led one explorer—Jean Nicollet, in 1634—to push into Lake Michigan wearing a Chinese robe!

Champlain’s detailed charts of the region he surveyed were published in 1613, and they represented the first such charts to be made widely available. They incorporated soundings of the waterways and information on the settlements and agricultural enterprises of the Native Americans. This information would be valuable to later French entrepreneurs and explorers who pushed farther west in pursuit of the pelts that sold so well in France, Holland and England. By the 1650s the general configuration of the Great Lakes appeared on French maps by Nicolas Sanson and others, suggesting that this information was widely enough known that it was no longer considered secret knowledge of traders.

The work of trappers and missionaries in the Wisconsin region led to the discovery of the large southern-flowing river that bore that name. Louis Jolliet was commissioned to make an expedition south on this river to the Mississippi in 1672, and he was accompanied by the Jesuit, Father Jacques Marquette, who sought to extend the reach of French Catholicism among the Native Americans. A major aim of the descent of the Mississippi was to begin the process of alliance-building that would forestall English efforts to push west from their seaboard colonies in the mid-Atlantic. The expedition failed to reach the mouth of the river, turning back near the juncture of the Arkansas. It was left to Rene-Robert Cavalier, better known as LaSalle, to complete the course of the Mississippi in 1682, claiming all of “Louisiana” (at the time a territory extending to what we now call the Dakotas) for France. His more ambitious later effort to establish a large colony at the mouth of the river failed when he overshot the delta and ended up having to settle those accompanying him on incommensurate grounds along the Texas coast.

LaSalle fell at the hands of his own men on one of their expeditions back north in pursuit of the lost Mississippi.

B3 British

English traders and trappers clashed with those of France in an on-going series of skirmishes that enlisted the loyalties and counter-loyalties of Amerindian tribes and, from the mid 17th to the mid 18th centuries, gradually defined the northeastern boundaries of the two nations' American Colonies. In the early period of this simmering conflict the Dutch too played a role, given their settlements at New Amsterdam, the island later to become the nucleus of New York City. The British-Indian-French conflicts culminated in the Seven-Years War (1756-1763) during which the British and their Iroquois allies held the French (and the Hurons) at bay and retained at least nominal control over the disputed western and northern regions.

It was after this period that the British began to organize reconnaissance of the westernmost parts of Canada. Thus in 1789 and again in 1792-1793 Alexander Mackenzie made his two long journeys from the western fort at Chipewyan: first north to the Arctic Ocean; second, west, across the Rocky Mountains to the Pacific. Slightly later (1807-1811) David Thompson conducted detailed surveys to the south of Mackenzie's western route, not only traversing the Rockies, but establishing the course of the Columbia River.

In thinking about the geographical exploration by the British from the Atlantic colonies before the war, it is valuable to notice important differences in what it can mean to "know the geography" of a region. These are differences of scale. For instance, by 1690, one might argue, the major "geographical" features of eastern North America were reasonably well known: the coast had been charted in considerable detail; the outline of the great lakes had been established; the courses of the major waterways were generally clear; and the existence of a broadly north-south range of mountains (the Appalachians) had been known for some time, as trade had probably passed over them since the 1650s. At the scale of major geographical features, there was not much to be discovered in eastern North America by the eighteenth century.

But, of course, someone with a nice early 18th century map of the region would have had a very difficult time using it on the ground to find the Ohio river. He (or she) would most likely have had to ask the best way west from homestead to homestead, consulting trappers, mountain men and English-speaking Native Americans for information on paths, shallow places on rivers to be crossed, and advise on which waterways were navigable. This too is "geographical" knowledge, but of a detailed, intimate sort. It is much more difficult to trace the evolution of that archive, as it existed in scratch maps, in practical advice, in the popular traditions of settlers and pioneers.

It was at this level that the most interesting geographical exploration went on in this period. We know a few names—Thomas Batts and Robert Fallam, for instance, who (with an Appomattox

guide named Perecute) reached across the watershed of the Appalachians in 1670—but we also know that hundreds, if not thousands, of Europeans had reached and surpassed that point before him. The fine textured geographical exploration of eastern North America was accomplished by largely English settlers and wanderers; it is a story that cannot be reduced to a handful of great names.

B4 United States

To some degree, the same thing can be said for the western exploration of North America after the English colonies established their independence from Britain and came to be called the United States. Trappers, traders and those romantics and outcasts who developed close ties to Native American communities or who wandered alone, these individuals were responsible for the first explorations west of the Mississippi. Nevertheless, in the wake of the Louisiana Purchase in 1803, the United States government commissioned a formal expedition to conduct reconnaissance into the vast new region acquired from France. The men selected to lead this journey were Meriwether Lewis and William Clark.

Between 1804 and 1806 the Lewis and Clark expedition (as it came to be called) made a truly remarkable circuit, west from St. Louis up the Missouri River, across the Rocky Mountains and eventually to the mouth of the Columbia River on the Pacific. About a quarter of this route can fairly said to have been unknown to European and U.S. explorers. In many important ways their journey was facilitated by a 16-year old American Indian woman named Sacajawea, who was the partner of one of the expedition's guides. Her linguistic abilities, and knowledge of the Bitterroot range, proved valuable. The expedition's reports, narratives, and maps, along with the many popular legends and images it evoked, all had a profound effect on American ideas of the west, and helped make the "great migrations" of the early 19th century possible. Clark's 1810 map of the expedition is thus a prophetic document, strongly suggesting the geographical destiny of the young nation [FIGURE].

The Lewis and Clark expedition had made its western penetration to the far north, into land not claimed by the Spanish, but President Jefferson was curious about the central and southern regions across the Mississippi as well. It was in investigating these regions—the upper Arkansas to the Rio Grande in 1806—that Lt. Zebulon Pike ended up a captive of Spanish troops. He was eventually returned, but his reconnaissance had indicated how thinly spread Spanish forces actually were in the southwest. Later, from 1817-1820 Stephen Long carried out surveys in the region of modern Kansas and Oklahoma. These, and the still more extensive expeditions of John C. Frémont (1842-1846), who reached California overland, certainly stand as important landmarks in the history of the American west, but these men could rely on networks of settlers and "mountain men" as they travelled. The regions they crossed could be found on atlas images of the United States available to any schoolmistress: so quickly had western expansion occurred; so quickly had the geographical archive of the expanding nation been codified.

V EXPLORATION FOR KNOWLEDGE (AND POWER)

While the citizens of the new American Republic were playing out their sense of geographical destiny by embracing the continent they claimed, the nations of Europe were busy reaching across the globe. They were doing so in two closely related ways: first, by means of expanding colonial empires; second, by means of expanding scientific efforts to understand the world—its physical processes, living creatures, and natural history. The history of geographical exploration from the late 18th to early 20th century must be understood in the context of science and imperialism.

The 19th century saw a tremendous extension of European colonialism. By the end of the century Europeans and descendants of Europeans claimed sovereignty over more than 80% of the earth's terrestrial surface. Needless to say, the administrative systems that controlled these lands (and their indigenous peoples) were highly variable, and, in many cases, places were colonial territory in name, but control on the ground was very limited. However, back in Europe people had limited knowledge of what was going on in distant parts of the colonies. What people knew were the maps of their nation's empire. On such maps, foreign places could be painted over in patriotic colors, and national flags could be pinned over remote islands. Geographical knowledge had never seemed so important. Emergent nationalism and the rise of the popular press created new and enthusiastic audiences for tales of distant voyages. In this context geographical explorers became national heroes in new ways. Their work was inseparable from the expansion of national empires.

This did not mean that explorers always acknowledged this fact. Rather, many conceived of themselves as men of science, pursuing disinterested geographical inquiry, seeking truth about the world, meticulously measuring and collecting as they travelled, in order to expand human understanding. The rise of distinctly “scientific” kind of exploration is linked to a larger and more complex story of the origins of European science itself, a history of great richness, and one not easily summarized. But perhaps the easiest way to see what characterized this emergent scientific spirit is to recognize that between the 14th and the 17th centuries the idea of “curiosity” went from being something like a *sin* to being something like the central *virtue* praised by a growing number of men, women, and specialized institutions like scientific societies. Travelers who travelled in the scientific spirit claimed to be *merely* curious, to be investigating the world for the sake of investigation itself, rather than for wealth or power. They saw themselves as communicating with others who shared their ideal.

A discerning reader will see that the imperial and scientific contexts of geographical exploration were thus very much at odds. One was exactly about national interests, the other was about being disinterested. The tension was a very real one in the works of explorers in the 19th century.

A The Pacific

No one exemplifies the intersection of geographical exploration, science, and empire better than Captain James Cook, who in three voyages to the Pacific (1768-1771, 1772-1775, 1776-1779) not only established the pattern for a properly scientific expedition, but also added more territory to the British Empire than any battle ever fought. Moreover, his violent death on Hawaii in 1779 at the hands of the native Hawaiians became one of the most romanticized incidents in the history of exploration, consecrating Cook's memory and defining English heroism for decades to come.

The Pacific was hardly unknown when Cook set off in 1768. In fact, his earliest voyage was roughly contemporaneous with a set of circumnavigations by both French and British ships, all of which cruised the island archipelagos of Polynesia and Melanesia. These included John Byron, Samuel Wallis, and Philip Carteret (for the British) and the Comte de Bougainville (for the French). Nevertheless, Cook's expeditions changed how Europeans envisioned the Pacific. Cook took with him a considerable entourage of painters and naturalists, as part of an expedition that had multiple aims. These included the abundantly scientific project of erecting a temporary observatory on the island of Tahiti, in order that astronomical observations could be made of the planet Venus as it passed in front of the sun. Precise measurements would contribute to the calculation of the Earth's distance from the Sun. But Cook also had another assignment: to head south of Tahiti in search of a *Terra Australis*, a southern continent. If he found it, he was to claim it for the British flag.

Cook had already established a reputation as an exceptionally skilled exploratory cartographer in Newfoundland. In his first Pacific voyage he did not disappoint, bringing back charts of the two islands of New Zealand, as well as a detailed map of the eastern coast of Australia. His young botanist, Joseph Banks, recorded and collected numerous novel plant species, and composed notes on the animals and fish that they encountered. Ethnographic accounts—descriptions of the local inhabitants—would be of still greater interest in Britain. Banks would go on to become the great patron of English exploration in the late 18th and early 19th century, founding and leading a number of different learned societies dedicated to supporting and commissioning explorers. He would serve as the central node in a vast web of politicians, scientists, travellers and military men who shared interests in exploring the globe, cataloguing its contents, and (in many cases) claiming large portions of it for the British Crown.

Cook's second and third expeditions were each successful in their own ways. The second passed into the Antarctic circle and circumnavigated the globe at an extremely southern latitude. It also served as an arduous testing ground for the new maritime chronometer (a very precise clock) that had been designed by John Harrison. Accurate clocks allowed ship captains and chart-makers to establish their longitude (east-west position) with precision; Harrison's chronometer changed navigation, exploration, and cartography. Maps of unprecedented accuracy became possible.

The third voyage reached north, and passed through the Bering Strait, confirming that Asia and North America were separated by the sea even at the extreme northern latitudes. The discovery of Hawaii on this voyage proved fateful, as it was there, in 1779, that Cook fell. While subsequent years saw several remarkable French voyages in the Pacific—the Comte de La Pérouse (1785-1788), who ranged to the four distant corners of the ocean before wrecking in the Solomon Islands; Joseph-Antoine d’Entrecasteaux, who circumnavigated Australia, and himself died in search of the lost La Perouse—Cook had changed the character of geographical exploration for good, and he became a sort of patron saint of British overseas exploits.

B South America

One effect of the voyages of Cook, Bougainville and others was that the Pacific came to seem like a sort of paradise in the European imagination: healthy, strong, and beautiful inhabitants enjoyed good food and delightful weather; joys of the flesh seemed nearer and more enticing. These people, it was decided, were “natural,” unburdened by the oppression of society. As a result, they were truly happy. This way of thinking about the Pacific was (obviously) naïve, but it gave rise to a deeply romantic ideal of native peoples in other places as well.

The great Prussian scholar/scientist/explorer, Alexander von Humboldt, brought those romantic associations with him when, in 1799, he set out with a Frenchman named Aimée Bonpland, to explore the Caribbean and northern South America. He changed the character of inland, terrestrial exploration as much as Cook changed that of naval exploration. The fame of Baron von Humboldt’s voyage, in the end, has more to do with his vast writings—more than thirty volumes!—than the length of his voyage, and while he did not exactly travel widely in regions unknown to European geography, he did change what Europeans thought geography was, and in doing so had a profound influence on future explorers.

Humboldt was a synthetic thinker. He believed (in a somewhat mystical way) that everything fit together somehow, and he felt that the global, cartographic, synthetic discipline of geography held the key to revealing the inner workings of nature. At the same time, influenced by movements in German thought at this time, Humboldt was an explorer who puzzled over *historical* questions. He was always curious about where things had come from—rivers, peoples, myths, languages, the weather—and he sought to understand how the sources of such diversities might be connected. In addition, Humboldt was a particularly passionate explorer, writing in sweeping terms, given (like his romantic associates) to exclamation and intense commune with the wonders of the natural world.

Curiously, though, he combined this very personal, emotional approach with an obsession with instruments. He carried with him every sort of thermometer, wind-meter, barometer, magnetic needle, and other measuring device he could find, and he insisted that true geographical exploration involved making—and mapping—countless measurements. The result was a set of

maps, using what are called “isolines,” that depicted the global distribution of different phenomena. These provided a new and powerful tool for understanding the world.

Humboldt made some interesting observations about the pattern of rivers in modern Venezuela and Brazil, but his real importance lies in the long list of 19th century explorers (in South America and elsewhere) who followed his approaches, and posed Humboldtian questions. One such explorer was Robert Schomburgk, originally also from Prussia, who received a commission from the Royal Geographical Society to explore the northeastern region of South America, called Guiana. From 1836 to 1844 Schomburgk explored and mapped in the area, connecting his map measurements to those of Humboldt, and using his writings about history and myth to find what he claimed was the true site of *El Dorado*. Schomburgk’s work was vital to British colonial interests in the region, and it “solved” one of the great mysteries in the history of exploration.

In a different way, the most famous of all 19th century explorer-scientists, Charles Darwin, was another young Humboldtian. His voyage on the *Beagle*—which circumnavigated the globe, but spent a great deal of time charting the coasts of South America—had been inspired by readings of Humboldt’s work. The question to which Darwin addressed himself—the origin of life and its development—can be understood as a very Humboldtian question, and the investigations of animal and plant distribution that Darwin conducted in trying to answer it owed much to similar work by Humboldt and others.

The profound biological richness of South America would continue to enthrall naturalists throughout the century. Men like Alfred Russell Wallace, Henry Walter Bates and Richard Spruce, would spend years in the 1850s and 1860s collecting specimens and living among the Amerindians of the Amazon.

C Africa

It is interesting to note the peculiar European fascination with the sources of rivers. Several explanations are possible. A very deep European mythology promised good things at a river’s source: grottos, nymphs, paradise itself. Perhaps these old stories had some subliminal power. In another sense, it is hard to explain where one is going when one sets off into the interior of an unfamiliar region. As most 19th century interior expeditions were done by river, and every river has a source, maybe the source of the river was the most convenient goal anyone could imagine.

Whatever the cause, expeditions to reach the sources of rivers were the common obsession of the nineteenth century, particularly in Africa. The eccentric Scotsman, James Bruce, became a national figure in Britain in the late 18th century when he published a swashbuckling account of his travels from 1769-1773 in a region he called Abyssinia, today composed of parts of Sudan, Eritrea and Ethiopia. His “discovery” of the sources of the Nile (he was in fact not the first European to reach Lake Tana, nor is it the source of the Blue Nile as he claimed) made him

something of a hero on his return. He raised eyebrows with many of his stories, particularly when he claimed that the tough herdsmen he encountered would strip meat from the hindquarters of their livestock for a snack, and then wait for the spot to heal, thus “milking” their herds for fresh steak! Bruce knew how to play on the squeamishness and exotic anxieties of his countrymen.

Bruce and Joseph Banks teamed up to encourage other British explorers who were willing to try pushing into the interior of Africa. One of their first protégés was another source-seeker, Mungo Park, who knew as well as Bruce how to write a story that would titillate his English readers. Park’s two expeditions (1795-1797, 1805-1806) both sought the sources (and the outflow) of the Niger River, which was known to flow to the east just south of the Sahara. Was it connected somehow with the Nile? Park would die on his second voyage trying to find out. But not before he composed his *Travels in the Interior of Africa*, which described the perilous adventures of his first expedition. He captured the European imagination by describing the explorer as vulnerable, and as an object of fascination to local people, particularly to local women. In doing so, it might be argued, he created a new persona for the explorer—not quite man of science, but not colonial agent either; rather, the boy-like explorer as object of romance.

Sorting out the path of the Niger would fall to Richard Lander, who in 1830 established that the river’s upper reaches were linked to the large delta pouring into the Gulf of Guinea near the trading port of Brass. Lander achieved broad recognition despite his humble background: he had his first taste of African exploration as a servant to Hugh Clapperton, the leader of a government-sponsored trans-Saharan expedition that descended to Lake Chad from Tripoli from 1822-25. Clapperton, with Lander at his side, would die in a later journey north toward Sokoto from Badagri (1825-27).

The source and course of the Niger was interesting, but the Nile occupied a particularly significant place in the European imagination. After all, its floods were the source of the fertile valley that gave rise to the fabulous civilization of the pyramids and the sphinx. Ancient myth suggested that the original “horn of plenty” or *cornucopia* had been cast into its waters by the Greek gods. Thus what might be called the “golden age” of geographical exploration by Europeans in Africa ran from the late 1850s to the early 1860s, during which time a number of celebrated explorers made expeditions aimed at identifying the sources of the Nile.

Issues of priority were always hotly contested. Richard Burton and John Hanning Speke headed west from the Zanzibar coast in 1857, and established the locations of two large inland lakes, Tanganyika and what Speke called Lake Victoria. They ended up dividing over which was linked to the Nile system, and they became adversaries in the course of their later work. From 1860 to 1863 Speke and James Grant made a follow-up expedition to the same region, pushing north and tracing the western edge of Lake Victoria. After continuing north they came upon what they suspected were the upper reaches of the Nile, a surmise that was confirmed by their unexpected encounter with Samuel Baker and his intrepid wife Florence, who had mounted the river from

Cairo. This confirmed in Speke and Grant's own minds (though not in those of all who received them back in Britain) that Lake Victoria was indeed the main source of the Blue Nile.

These expeditions, but particularly the earlier ones in the Niger region, cannot be separated from the history of the slave trade, a subject of great dispute among European nations in this period. Britain banned slave trade (though not slavery itself) in 1807, but many nations (Portugal, Spain) did not follow suit. For both economic and humanitarian reasons different powerful groups in Britain and France wanted to investigate the African kingdoms in which slaving expeditions occurred. The hope of many was that better knowledge of these areas might lead to an end to the slavers' depredations. The famous expeditions of David Livingstone, who spent nearly 25 years exploring southern Africa, were particularly focused on missionary and abolitionist work.

Livingstone was also interested in sources and among his earliest expeditions (1849-50 and 1853-1856, and again from 1858-1864) he sought the sources of the Zambezi river. In the process he made an extensive circuit around lake Malawi, and crossed the entire continent in that latitude. His most celebrated travels, however, involved yet another (ill-fated) attempt to establish the source of the Nile, there having remained speculation that, in reality, the primary source might be lake Tanganyika.

This expedition, instead of taking a year or so, dragged on from 1867-1871, as Livingstone took up with different trading groups, lost his porters, and became increasingly disillusioned with his African enterprises. He was "rescued" by the American, Henry Morton Stanley, who had received funding from a U.S. newspaper anxious to get the "scoop" on Livingstone's whereabouts. Together this unlikely team demonstrated that the Lake Tanganyika was definitively not linked to Nile system. Rather, it looked like a thin stream connected it to the upper reaches of the Congo. It was exploring in this area that Livingstone died in 1873, at the age of 60. His body was returned to London, and received a state funeral in the national shrine of Westminster, a symbol of how the explorer lay close to the heart of Victorian Britain.

The work of such explorers resulted in maps. It was on those maps that European leaders would draw lines symbolizing their respective claims on the continent at the Berlin Conference of 1884-1885, a meeting that is now recalled as the opening of the "Scramble for Africa," perhaps the most blatant instance of imperial cartography in the age of empire.

D Australia

Geographically speaking, the exploration of Australia was something like the reverse of that of Africa. When Matthew Flinders—an admirer of Cook—undertook his charting expeditions around this southern continent (1798-1803), he found many fewer large river mouths than he expected. This gave rise to speculation that the rivers that ran to the west of the Blue Mountains might run to some large inland sea or lake. In the 1830s both Charles Sturt and Thomas Mitchell

traced these rivers—the Lachlan, the Murrumbidgee, the Murray—to Encounter Bay, not far from where Colonel William Light would lay out the city of Adelaide. In the late 1830s and 1840s the south and west coasts would be surveyed by George Grey (who would go on to be Colonial Governor) and Edward Eyre. Sturt pushed north from Adelaide to explore the region to the east of Lake Torrens and the Stony Desert. A German named Ludwig Leichhardt—an admirer of Humboldt—made a remarkable journey from the far east to the extreme north from 1844-1845.

Tragedy attended many of these expeditions, at least as far as the Aboriginal Australians were concerned. Its origins as a penal settlement gave Australia, and an unfortunate number of its early settlers, a menacing air. Treatment of native peoples was never good, and a policy close to genocide was pursued in several areas. The land exacted its revenge on those who tried to cross the continent from south to north in the early 1860s: Robert O’Hara Burke and his companion, William John Wills, both died in the attempt, as did a third man in their party. John McDougal Stuart, a former companion of Sturt, succeeded only on his third attempt, in 1862, after numerous clashes with Aboriginal peoples defending their territory and provisions.

E Polar Regions

The forbidding conditions at the extreme northern and southern regions of the globe turned away explorers for centuries. Little stood to be gained in reaching these points. There was nothing but ice at both of them—literally nothing but ice at the North Pole, as the arctic is merely an ice-cap, without land below. Antarctica was the last continent to be discovered, and while it is associated with the names of a number of great explorers—Scott, Shackleton, Amundsen—much of its rough coast was known to sealers and whalers before the region became a zone of intensive formal exploration.

E1 Arctic

Before the project of reaching the North Pole became a subject of world-wide media attention (as it did in the early 20th century), arctic explorers remained focused on completing the Northwest and Northeast passages, so long the fascination of European geographers, politicians and merchants. John Franklin set out with a commission from the British Admiralty in 1845 to find a route to the Pacific over North America. His large expedition vanished, leading to an intensive decade-long series of rescue expeditions of various nations and sizes. The melancholy memoirs of Franklin’s last days, along with the remains of some of his party, were later found on King William Island. They had frozen to death after their ships became trapped in shifting ice.

One of those who set out to find Franklin, Robert McClure, negotiated much of the passage from the Pacific, but had to abandon his ship midway. Rescued via the Atlantic route, he and his men

completed the Northwest passage in 1854, but not by a single voyage in a single ship. That had to await the crossing made by Roald Amundsen with six companions in a small boat from 1903-1906. Nils Nordenskjöld completed the northeast passage in 1879.

One of Nordenskjöld's disciples, Fridtjof Nansen made an early attempt on the North Pole itself in 1893, having already conducted a successful trans-Greenland expedition. His bid for the Pole, however failed, and became a three-year circuit in the Siberian Arctic. The fame for being the first man to reach the Pole fell to an American named Robert Peary, on his sixth and final arctic expedition. His claim was much disputed at the time, as it was notoriously difficult to validate. The best evidence to date (photogrammetric analysis undertaken by the National Geographic Society) suggests he was telling the truth. It is worth noting that he was sponsored by the Society.

E2 Antarctic

Bury a continent beneath a dozen feet of pack ice, and it is difficult even to see, much less cross. Antarctica entered the European geographical imagination as something of a phantom. Cook came close enough that he might have spied it, were it not for the thick air and uncertain light he found in the southernmost latitudes. Fifty years later the Russian Thaddeus Bellingshausen circumnavigated the southern continent, coming in several instances within a few kilometers of land. He saw the ice, but did not spot the tell-tale "nunataks," or visible, dark mountains that push through the sheet ice in some places. In 1831, a decade after Bellingshausen, John Briscoe, a mariner in the service of a large English whaling company, did.

A set of national expeditions followed in the 1830s and 1840s sponsored by Great Britain, the United States and France. Each approached by sea, each was preoccupied with charting the coast and claiming territory. Later national and scientific expeditions at the end of the 19th and beginning of the 20th century set the stage for the so-called "heroic age" of Antarctic exploration. This period saw intense international attention focused on a "race for the South Pole." After Ernest Shackleton came within 100 miles of the pole in 1908, the stage was set for a final dash. The (unofficial) contestants were the Norwegian Amundsen and the Briton Robert Scott. Scott emulated Shackleton in a number of strategies, including the use of motorized vehicles.

He also relied on sled dogs to a lesser degree than his rival Amundsen, who, after laying-in a series of stores along the route, conquered the Pole in a swift two-month strike late in 1911. Scott reached the pole about a month later, after a grueling approach by a different but longer route. The 1300 kilometer return journey looked bleak indeed after this failure. Scott and his men never returned, freezing to death on their sad route back. Their last journals, found later, captured wide public sympathy.

VI CONCLUSION

Geographical exploration has always meant finding *terra incognita* (“unknown land”), doing the work of knowing it, and then returning to contribute what was learned to a geographical archive. But it is important to remember that what is blank on your map depends on what questions you ask. In this sense, the process of exploration itself does not really end, even as the features of the earth’s surface (and increasingly those beneath the sea as well) come to be known in staggering detail through the use of remote sensing and satellite imagery. Increasingly, scientists are asking new questions about the global patterns of ecological systems. This demands a new kind of surveying of the world, examining (for instance) biodiversity and ecosystem stability. Is this “geographical exploration”? In important ways it represents an extension of the traditions explored in this article.

Moreover, for many on the planet—the poor, those in remote and less-developed countries—the archive of the world created by Western geographical explorers may remain remote. Much of that archive, as we have seen, emerged as part of an effort to know the world precisely in order to exploit and control distant territories and their inhabitants. The history of geographical exploration in the Western tradition and the history of European imperialism are difficult to disentangle. For this reason, some people—Amerindians in Central America, Aboriginal Australians—have shown an interest in researching and extending their own traditions of “earth-writing,” in some cases combining their traditional accounts of their lands with modern technologies of cartography as part of efforts to regain lost territory. These efforts represent attempts to translate across different geographical archives—a new horizon for a new generation of geographical explorers prepared to cross a new set of cultural, not physical, boundaries.

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