ESSAYS

For centuries, historians have discussed the first engagements among Europeans, western Africans, and North and South Americans. Some scholars have wondered how the Spanish and Portuguese so easily defeated powerful indigenous empires. Others have tried to reckon with how much Native American societies were changed. The following essays question our assumptions about these momentous years. In the first, Neal Salisbury observes that the arrival of Europeans and Africans may not have altered indigenous life as much as previously assumed. Long before 1492, Native Americans had dealt with diversities of peoples, places, languages, and objects. They had made war, made peace, and crafted new alliances over time. Without doubt, Europeans posed a new and potent presence, but to claim that their advent altered everything may minimize the complexities of Native American history. The second essay, by Joyce Appleby, fixates on how the Americas helped create new worlds of imagination for Europeans. She suggests that before 1492, Europeans were an uncurious people whose minds had been circumscribed by the Catholic Church. New land masses, people, animals, and materials pushed them to reconsider the world. Studying the natural environment rose in prominence and radically transformed the West.

The Indians' Old World

NEAL SALISBURY

Scholars in history, anthropology, archaeology, and other disciplines have turned increasingly over the past two decades to the study of native peoples during the colonial period of North American history. The new work in Indian history has altered the way we think about the beginning of American history and about the era of European colonization. Historians now recognize that Europeans arrived, not in a virgin land, but in one that was teeming with several million people. Beyond filling in some of the vast blanks left by previous generations' overlooking of Indians, much of this scholarship makes clear that Indians are integral to the history of colonial North America. In short, surveys of recent textbooks and of scholarly titles suggest that Native Americans are well on their way to being "mainstreamed" by colonial historians.

Substantive as this reorientation is, it remains limited. Beyond the problems inherent in representing Indian/non-Indian interactions during the colonial era lies the challenge of contextualizing the era itself. Despite opening chapters and lectures that survey the continent's native peoples and cultures, most historians continue to represent American history as having been set in motion by the arrival of European explorers and colonizers. They have yet to recognize the existence of a North American—as opposed to English or European—background for colonial history, much less to consider the implications of such a background

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for understanding the three centuries following Columbus's landfall. Yet a growing body of scholarship by archaeologists, linguists, and students of Native American expressive traditions recognizes 1492 not as a beginning but as a single moment in a long history utterly detached from that of Europe....

... [I]ndigenous North Americans exhibited a remarkable range of languages, economies, political systems, beliefs, and material cultures. But this range was less the result of their isolation from one another than of the widely varying natural and social environments with which Indians had interacted over millennia. What recent scholars of pre-colonial North America have found even more striking, given this diversity, is the extent to which native peoples' histories intersected one another.

At the heart of these intersections was exchange. By exchange is meant not only the trading of material goods but also exchanges across community lines of marriage partners, resources, labor, ideas, techniques, and religious practices. Longer-distance exchanges frequently crossed cultural and linguistic boundaries as well and ranged from casual encounters to widespread alliances and networks that were economic, political, and religious. For both individuals and communities, exchanges sealed social and political relationships. Rather than accumulate material wealth endlessly, those who acquired it gave it away, thereby earning prestige and placing obligations on others to reciprocate appropriately. And as we shall see, many goods were not given away to others in this world but were buried with individuals to accompany them to another....

By the twelfth century, agricultural production had spread over much of the Eastern Woodlands as well as to more of the Southwest. In both regions, ... more complex societies were emerging to dominate widespread exchange networks. In the Mississippi Valley and the Southeast, the sudden primacy of maize horticulture is marked archaeologically in a variety of ways—food remains, pollen profiles, studies of human bone (showing that maize accounted for 50 percent of people's diets), and in material culture by a proliferation of chert hoes, shell-tempered pottery for storing and cooking, and pits for storing surplus crops. These developments were accompanied by the rise of what archaeologists term "Mississippian" societies, consisting of fortified political and ceremonial centers and outlying villages. The centers were built around open plazas featuring platform burial mounds, temples, and elaborate residences for elite families. Evidence from burials makes clear the wide social gulf that separated commoners from elites. Whereas the former were buried in simple graves with a few personal possessions, the latter were interred in the temples or plazas along with many more, and more elaborate, goods such as copper ornaments, massive sheets of shell, and ceremonial weapons. Skeletal evidence indicates that elites ate more meat, were taller, performed less strenuous physical activity, and were less prone to illness and accident than commoners....

The largest, most complex Mississippian center was Cahokia, located not far from the confluence of the Mississippi and Missouri rivers, near modern East St. Louis, Illinois, in the rich floodplain known as American Bottoms. By the twelfth century, Cahokia probably numbered 20,000 people and contained over 120 mounds within a five-square-mile area.... One key to Cahokia's rise was its combination of rich soil and nearby wooded uplands, enabling inhabitants

to produce surplus crops while providing an abundance and diversity of wild food sources along with ample supplies of wood for fuel and construction. A second key was its location, affording access to the great river systems of the North American interior.

Cahokia had the most elaborate social structure yet seen in North America. Laborers used stone and wooden spades to dig soil from "borrow pits" (at least nineteen have been identified by archaeologists), which they carried in wooden buckets to mounds and palisades often more than half a mile away. The volume and concentration of craft activity in shell, copper, clay, and other materials, both local and imported, suggests that specialized artisans provided the material foundation for Cahokia's exchange ties with other peoples. Although most Cahokians were buried in mass graves outside the palisades, their rulers were given special treatment. At a prominent location in Mound 72, the largest of Cahokia's platform mounds, a man had been buried atop a platform of shell beads. Accompanying him were several group burials: fifty young women, aged 18 to 23, four men, and three men and three women, all encased in uncommonly large amounts of exotic materials. As with the Natchez Indians observed by the French in Louisiana, Cahokians appear to have sacrificed individuals to accompany their leaders in the afterlife. Cahokia was surrounded by nine smaller mound centers and several dozen villages from which it obtained much of its food and through which it conducted its waterborne commerce with other Mississippian centers in the Midwest and Southeast....

At the outset of the twelfth century, the center of production and exchange in the Southwest was in the basin of the San Juan River at Chaco Canyon in New Mexico, where Anasazi culture achieved its most elaborate expression. A twelve-mile stretch of the canyon and its rim held twelve large planned towns on the north side and 200 to 350 apparently unplanned villages on the south. The total population was probably about 15,000. The towns consisted of 200 or more contiguous, multistoried rooms, along with numerous kivas (underground ceremonial areas), constructed of veneered masonry walls and log beams imported from upland areas nearly fifty miles distant. The rooms surrounded a central plaza with a great kiva. Villages typically had ten to twenty rooms that were decidedly smaller than those in the towns. Nearly all of Chaco Canyon's turquoise, shell, and other ornaments and virtually everything imported from Mesoamerica are found in the towns rather than the villages. Whether the goods were considered communal property or were the possessions of elites is uncertain, but either way the towns clearly had primacy. Villages buried their dead near their residences, whereas town burial grounds were apparently located at greater distances, although only a very few of what must have been thousands of town burials have been located by archaeologists. Finally, and of particular importance in the arid environment of the region, the towns were located at the mouths of side canyons where they controlled the collection and distribution of water run-off....

The canyon was the core of an extensive network of at least seventy towns or "outliers," as they are termed in the archaeological literature, and 5,300 villages located as far as sixty miles from the canyon.... Facilitating the movement

of people and goods through this network was a system of roads radiating outward from the canyon in perfectly straight lines, turning into stairways or footholds rather than circumventing cliffs and other obstacles....

When Europeans reached North America .... the continent's demographic and political map was in a state of profound flux. A major factor was the collapse of the great centers at Cahokia and Chaco Canyon and elsewhere in the Midwest and Southwest. Although there were significant differences between these highly centralized societies, each ran up against the capacity of the land or other resources to sustain it....

Such combinations of continuity and change, persistence and adaptability, arose from concrete historical experiences rather than a timeless tradition. The remainder of this [essay] indicates some of the ways that both the deeply rooted imperatives of reciprocity and exchange and the recent legacies of competition and upheaval informed North American history as Europeans began to make their presence felt.

Discussion of the transition from pre- to postcontact times must begin with the sixteenth century, when Indians and Europeans met and interacted in a variety of settings. When not slighting the era altogether, historians have viewed it as one of discovery or exploration, citing the achievements of notable Europeans in either anticipating or failing to anticipate the successful colonial enterprises of the seventeenth century. Recently, however, a number of scholars have been integrating information from European accounts with the findings of archaeologists to produce a much fuller picture of this critical period in North American history.

The Southeast was the scene of the most formidable attempts at colonization during the sixteenth century, primarily by Spain. Yet in spite of several expeditions to the interior and the undertaking of an ambitious colonizing and missionary effort, extending from St. Augustine over much of the Florida peninsula and north to Chesapeake Bay, the Spanish retained no permanent settlements beyond St. Augustine itself at the end of the century. Nevertheless, their explorers and missionaries opened the way for the spread of smallpox and other epidemic diseases over much of the area south of the Chesapeake and east of the Mississippi....

As in the Southeast, Spanish colonizers in the sixteenth-century Southwest launched several ambitious military and missionary efforts, hoping to extend New Spain's domain northward and to discover additional sources of wealth. The best-documented encounters of Spanish with Pueblos—most notably those of Coronado's expedition (1540–1542)—ended in violence and failure for the Spanish who, despite vows to proceed peacefully, violated Pueblo norms of reciprocity by insisting on excessive tribute or outright submission. In addition, the Spanish had acquired notoriety among the Pueblos as purveyors of epidemic diseases, religious missions, and slaving expeditions inflicted on Indians to the south, in what is now northern Mexico.

The Spanish also affected patterns of exchange throughout the Southwest. Indians resisting the spread of Spanish rule to northern Mexico stole horses and other livestock, some of which they traded to neighbors. By the end of the sixteenth century, a few Indians on the periphery of the Southwest were riding

horses, anticipating the combination of theft and exchange that would spread horses to native peoples throughout the region and, still later, the Plains and the Southeast. In the meantime, some Navajos and Apaches moved near the Rio Grande Valley, strengthening ties with certain pueblos that were reinforced when inhabitants of those pueblos sought refuge among them in the face or wake of Spanish *entradas*.

Yet another variation on the theme of Indian-European contacts in the sixteenth century was played out in the Northeast, where Iroquoian-speaking villagers on the Mississippian periphery and Archaic hunter-gatherers still further removed from developments in the interior met Europeans of several nationalities. At the outset of the century, Spanish and Portuguese explorers enslaved several dozen Micmacs and other Indians from the Nova Scotia–Gulf of St. Lawrence area. Three French expeditions to the St. Lawrence itself in the 1530s and 1540s followed the Spanish pattern by alienating most Indians encountered and ending in futility. Even as these hostile contacts were taking place, fishermen, whalers, and other Europeans who visited the area regularly had begun trading with natives....

What induced Indians to go out of their way to trap beaver and trade the skins for glass beads, mirrors, copper kettles, and other goods? Throughout North America since Paleo-Indian times, exchange in the Northeast was the means by which people maintained and extended their social, cultural, and spiritual horizons as well as acquired items considered supernaturally powerful. Members of some coastal Indian groups later recalled how the first Europeans they saw, with their facial hair and strange clothes and traveling in their strange boats, seemed like supernatural figures. Although soon disabused of such notions, these Indians and many more inland placed special value on the glass beads and other trinkets offered by the newcomers. Recent scholarship on Indians' motives in this earliest stage of the trade indicates that they regarded such objects as the equivalents of the quartz, mica, shell, and other sacred substances that had formed the heart of long-distance exchange in North America for millennia and that they regarded as sources of physical and spiritual well-being, on earth and in the afterlife. Indians initially altered and wore many of the utilitarian goods they received, such as iron axe heads and copper pots, rather than use them for their intended purposes. Moreover, even though the new objects might pass through many hands, they more often than not ended up in graves, presumably for their possessors to use in the afterlife. Finally, the archaeological findings make clear that shell and native copper predominated over the new objects in sixteenth-century exchanges, indicating that European trade did not suddenly trigger a massive craving for the objects themselves. While northeastern Indians recognized Europeans as different from themselves, they interacted with them and their materials in ways that were consistent with their own customs and beliefs.

By the late sixteenth century, the effects of European trade began to overlap with the effects of earlier upheavals in the northeastern interior. Sometime between Jacques Cartier's final departure in 1543 and Samuel de Champlain's arrival in 1603, the Iroquoian-speaking inhabitants of Hochelaga and Stadacona (modern Montreal and Quebec City) abandoned their communities. The communities were crushed militarily, and the survivors dispersed among both Iroquois and

Hurons. Whether the perpetrators of these dispersals were Iroquois and Huron is a point of controversy, but either way the St. Lawrence communities appear to have been casualties of the rivalry, at least a century old, between the two confederations as each sought to position itself vis-á-vis the French. The effect, if not the cause, of the dispersals was the Iroquois practice of attacking antagonists who denied them direct access to trade goods; this is consistent with Iroquois actions during the preceding two centuries and the century that followed.

The sudden availability of many more European goods, the absorption of many refugees from the St. Lawrence, and the heightening of tensions with the Iroquois help to explain the movement of most outlying Huron communities to what is now Simcoe County area of Ontario during the 1580s. This geographic concentration strengthened their confederacy and gave it the form it had when allied with New France during the first half of the seventeenth century. Having formerly existed at the outer margins of an arena of exchange centered in Cahokia, the Hurons and Iroquois now faced a new source of goods and power to the east.

The diverse native societies encountered by Europeans as they began to settle North America permanently during the seventeenth century were not static isolates lying outside the ebb and flow of human history. Rather, they were products of a complex set of historical forces, both local and wide ranging, both deeply rooted and of recent origin. Although their lives and worldviews were shaped by long-standing traditions of reciprocity and spiritual power, the people in these communities were also accustomed—contrary to popular myths about inflexible Indians—to economic and political flux and to absorbing new peoples (both allies and antagonists), objects, and ideas, including those originating in Europe. Such combinations of tradition and innovation continued to shape Indians' relations with Europeans, even as the latter's visits became permanent.

The establishment of lasting European colonies, beginning with New Mexico in 1598, began a phase in the continent's history that eventually resulted in the displacement of Indians to the economic, political, and cultural margins of a new order. But during the interim natives and colonizers entered into numerous relationships in which they exchanged material goods and often supported one another diplomatically or militarily against common enemies. These relations combined native and European modes of exchange. While much of the scholarly literature emphasizes the subordination and dependence of Indians in these circumstances, Indians as much as Europeans dictated the form and content of their early exchanges and alliances. Much of the protocol and ritual surrounding such intercultural contacts was rooted in indigenous kinship obligations and gift exchanges, and Indian consumers exhibited decided preferences for European commodities that satisfied social, spiritual, and aesthetic values. Similarly, Indians' long-range motives and strategies in their alliances with Europeans were frequently rooted in older patterns of alliance and rivalry with regional neighbors. Such continuities can be glimpsed through a brief consideration of the early colonial-era histories of the Five Nations Iroquois in the Northeast, ... and the Rio Grande Pueblos in the Southwest.

Post-Mississippian and sixteenth-century patterns of antagonism between the Iroquois and their neighbors to the north and west persisted, albeit under altered

circumstances, during the seventeenth century when France established its colony on the St. Lawrence and allied itself with Hurons and other Indians. France aimed to extract maximum profits from the fur trade, and it immediately recognized the Iroquois as the major threat to that goal. In response, the Iroquois turned to the Dutch in New Netherland for guns and other trade goods while raiding New France's Indian allies for the thicker northern pelts that brought higher prices than those in their own country (which they exhausted by midcentury) and for captives to replace those from their own ranks who had died from epidemics or in wars. During the 1640s, the Iroquois replaced raids with full-scale military assaults (the so-called Beaver Wars) on Iroquoian-speaking communities in the lower Great Lakes, absorbing most of the survivors as refugees or captives. All the while, the Iroquois elaborated a vision of their confederation, which had brought harmony within their own ranks, as bringing peace to all peoples of the region. For the remainder of the century, the Five Nations fought a grueling and costly series of wars against the French and their Indian allies in order to gain access to the pelts and French goods circulating in lands to the north and west.

Meanwhile, the Iroquois were also adapting to the growing presence of English colonists along the Atlantic seaboard.... After the English supplanted the Dutch in New York in 1664, Iroquois diplomats established relations with the proprietary governor, Sir Edmund Andros, in a treaty known as the Covenant Chain. The Covenant Chain was an elaboration of the Iroquois' earlier treaty arrangements with the Dutch, but, whereas the Iroquois had termed the Dutch relationship a chain of iron, they referred to the one with the English as a chain of silver. The shift in metaphors was appropriate, for what had been strictly an economic connection was now a political one in which the Iroquois acquired power over other New York Indians. After 1677, the Covenant Chain was expanded to include several English colonies, most notably Massachusetts and Maryland, along with those colonies' subject Indians. The upshot of these arrangements was that the Iroquois cooperated with their colonial partners in subduing and removing subject Indians who impeded settler expansion. The Mohawks in particular played a vital role in the New England colonies' suppression of the Indian uprising known as King Philip's War and in moving the Susquehannocks away from the expanding frontier of settlement in the Chesapeake after Bacon's Rebellion.

For the Iroquois, such a policy helped expand their "Tree of peace" among Indians while providing them with buffers against settler encroachment around their homelands. The major drawback in the arrangement proved to be the weakness of English military assistance against the French. This inadequacy, and the consequent suffering experienced by the Iroquois during two decades of war after 1680, finally drove the Five Nations to make peace with the French and their Indian allies in the Grand settlement of 1701. Together, the Grand Settlement and Covenant Chain provided the Iroquois with the peace and security, the access to trade goods, and the dominant role among northeastern Indians they had long sought. That these arrangements in the long run served to reinforce rather than deter English encroachment on Iroquois lands and autonomy

should not obscure their pre-European roots and their importance in shaping colonial history in the Northeast....

In the Southwest, the institution of Spanish colonial rule on the Rio Grande after 1598 further affected exchange relations between Pueblo Indians and nearby Apaches and Navajos. By imposing heavy demands for tribute in the form of corn, the Spanish prevented Pueblo peoples from trading surplus produce with their non-farming neighbors. In order to obtain the produce on which they had come to depend, Apaches and Navajos staged deadly raids on some pueblos, leaving the inhabitants dependent on the Spanish for protection. In retaliation, Spanish soldiers captured Apaches and Navajos whom they sold as slaves to their countrymen to the south. From the beginning, the trading pueblos of Pecos, Picuris, and Taos most resented Spanish control and strongly resisted the proselytizing of Franciscan missionaries. From the late 1660s, drought and disease, intensified Apache and Navajo raids, and the severity of Spanish rule led more and more Indians from all pueblos to question the advantages of Christianity and to renew their ties to their indigenous religious traditions. Spanish persecution of native religious leaders and their backsliding followers precipitated the Pueblo Revolt of 1680, in which the trading Pueblos played a leading role and which was actively supported by some Navajos and Apaches.

When the Spanish reimposed their rule during the 1690s, they tolerated traditional Indian religion rather than trying to extirpate it, and they participated in interregional trade fairs at Taos and other villages. The successful incorporation of Pueblo Indians as loyal subjects proved vital to New Mexico's survival as a colony and, more generally, to Spain's imperial presence in the Southwest during the eighteenth and early nineteenth centuries.

As significant as is the divide separating pre- and post-Columbian North American history, it is not the stark gap suggested by the distinction between prehistory and history. For varying periods of time after their arrival in North America, Europeans adapted to the social and political environments they found, including the fluctuating ties of reciprocity and interdependence as well as rivalry, that characterized those environments. They had little choice but to enter in and participate if they wished to sustain their presence. Eventually, one route to success proved to be their ability to insert themselves as regional powers in new networks of exchange and alliance that arose to supplant those of the Mississippians, Anasazis, and others.

To assert such continuities does not minimize the radical transformations entailed in Europeans' colonization of the continent and its indigenous peoples. Arising in Cahokia's wake, new centers at Montreal, Fort Orange/Albany, Charleston, and elsewhere permanently altered the primary patterns of exchange in eastern North America. The riverine system that channeled exchange in the interior of the continent gave way to one in which growing quantities of goods arrived from, and were directed to, coastal peripheries and ultimately Europe. In the Southwest, the Spanish revived Anasazi links with Mesoamerica at some cost to newer ties between the Rio Grande Pueblos and recently arrived, nonfarming Athapaskan speakers. More generally, European colonizers brought a complex of demographic and ecological advantages, most notably epidemic diseases and their

own immunity to them, that utterly devastated Indian communities; ideologies and beliefs in their cultural and spiritual superiority to native peoples and their entitlement to natives' lands; and economic, political, and military systems organized for the engrossment of Indian lands and the subordination or suppression of Indian peoples.

Europeans were anything but uniformly successful in realizing their goals, but the combination of demographic and ecological advantages and imperial intentions, along with the Anglo-Iroquois Covenant Chain, enabled land-hungry colonists from New England to the Chesapeake to break entirely free of ties of dependence on Indians before the end of the seventeenth century. Their successes proved to be only the beginning of a new phase of Indian-European relations. By the mid-eighteenth century, the rapid expansion of land-based settlement in the English colonies had sundered older ties of exchange and alliance linking natives and colonizers nearly everywhere east of the Appalachians, driving many Indians west and reducing those who remained to a scattering of politically powerless enclaves in which Indian identities were nurtured in isolation. Meanwhile, the colonizers threatened to extend this new mode of Indian relations across the Appalachians. An old world, rooted in indigenous exchange, was giving way to one in which Native Americans had no certain place.

The Europeans' New World

JOYCE APPLEBY

When Christopher Columbus returned from the Western Hemisphere in the spring of 1493, he came with news that would decisively change Europe. No consequence would be more portentous than the conversation his discoveries prompted about the natural world, for he made the subject of nature suddenly interesting with all the odd things he brought home. Sailing back to Spain on the *Niña,* he packed the little caravel to the gunwales with fantastic objects from the Caribbean islands he visited. Six Taino natives, out of a dozen, survived the return trip, giving vivid proof that people lived in what geographers called the antipodes. Birds from the West Indies survived the trip better than the Tainos. Columbus had plucked flowers even more colorful than the brilliant parrots he found in the tropical rain forests. He showed his sponsors, King Ferdinand and Queen Isabella, a bit of gold that some natives had given him, thinking that it would guarantee funding for subsequent voyages—and he was right.

Over the course of the next three centuries, a succession of amateur investigators laid the foundation for the modern life sciences even though before the end of the fifteenth century, Europeans had been an incurious people. Finding these masses of land filled with mysterious people, unfamiliar plants, weird animals, and striking topography produced the kind of shock essential to shaking

free of the church's venerable injunction against asking questions about nature. Men and women in China and Muslim Spain's Córdoba had demonstrated a much stronger inquisitive spirit. In Europe, isolation and religious disapproval had curtailed curiosity for over a millennium.

Today, plying incessant questions to nature is one of the strongest features of the modern West. The stirring of Europeans' interest in the physical world began at the end of the fifteenth century with the discovery of two continents lying between them and the Orient. Like most profound cultural changes, there were layers of habits and convictions to work through before Europeans could engage fully with the natural world. They had to break with the church's prohibition of intrusive questioning about God's domain—the phenomena of his created universe. The assumption that they already knew everything worth knowing had erected another barrier to the investigative spirit, as well as the predisposition to look backward to biblical or classical times for guidance and knowledge. The designation New World suggests the dimension of their surprise....

The Catholic Church had succeeded for a thousand years in keeping curiosity in check out of fear of probing questions about cosmic events like eclipses and comets. Such inquiries were deemed vain, a petty challenge to God's all-encompassing knowledge. Of course the church couldn't suppress all curiosity, certainly not a child's endless queries about what and why. But even the spirits of children will be dulled if the answers they hear are always "because God willed it so." The campaign against curiosity began with Augustine, who lived when Christianity was becoming the dominant religion in Europe....

A very powerful and pervasive institution, the church claimed the authority to discriminate between legitimate and illicit knowledge, between permitted and prohibited questions, even between accepted and forbidden methods of acquiring knowledge. After the Reformation, Protestant leaders revived the attack on curiosity in the sixteenth century. John Calvin associated it with the deadliest of deadly sins: pride. King James I of England pointed to Eve for evidence of how curiosity could harm someone.

Europeans were little exposed to the larger world through travel. Religion had stirred crusades to the Holy Lands in the tenth, eleventh, and twelfth centuries, but after that, the crusaders' descendants stayed put. Overland trade with Asia was cut off for decades at a time. Still, there were some venturous souls. Merchants in Genoa and Majorca began visiting the islands off Africa. The Vivaldi brothers of Genoa set sail west to India, but were never heard from again.

When that most celebrated traveler, Marco Polo, returned to Europe in 1294, he landed in a Genoese prison. Fortunately for thousands of future readers, his cell mate happened to be a writer. To him, Polo recounted the details of his Venetian merchant family's twenty years in the Orient and how his father met Kublai Khan, the grandson of Genghis Kahn. He described their encounters as diplomats and traders at the great Mongol court at Karakorum and the high drama of their escape from their possessive host in a perilous two-year voyage. Most Europeans got their first impression of China, India, and Japan from this travel journal.

Henry the Navigator, a Portuguese prince, spent his considerable fortune sending expeditions down the west coast of Africa in the middle decades of the fifteenth century. He was determined to find out what lay south of Cape Bojador at the 24th parallel, which marked the farthest that Europeans had sailed down the west coast of Africa, but he dispatched others there, preferring to stay at home himself.

Henry was fired by the desire to wrest the Canary Islands from Spain and to find a coastal source for the gold and slaves traded in the interior of the African continent. Where he differed from his predecessors was in recognizing the importance of improving navigation. While fighting for Portugal against the Arabs in Morocco, he took stock of what their mariners knew about commercial linkages and the level of their sailing skills. He familiarized himself with Arab mapmaking. Never going to sea himself, Henry was content with gathering around him in his academy at Sagres a cadre of expert navigators, shipwrights, astronomers, pilots, and cartographers, both Christian and Jewish. He was mindful of fears that the southern waters were filled with monsters and wrapped in deadly fog, but he calmly stated, "You cannot find a peril so great that the hope of reward will not be greater." Like Columbus a half century later, ambition fueled his many navigational projects.

The ships that plied the Mediterranean were far too slow and large for oceanic travel. Venturing out in this unknown stretch of the Atlantic demanded new techniques and new equipment, accrued through trial and error. Arab navigators in the southern Mediterranean had introduced triangular sails, fore and aft, called lateen sails. They also added a small foremast, the mizzen, that improved steering. Henry incorporated these Arab inventions into his light, fast caravel, rigged for sailing close to the wind. From his estate perched on the rocky promontory jutting into the Atlantic in the southwest corner of Portugal, he sent pairs of these caravels to chart the winds and waters along the bulge of Africa.

From the 1420s until his death in 1460, Henry's expeditions got ever larger; they located successful routes and found safe harbors for provisioning. Slowly, after many failed endeavors, they solved the problems of navigation in the South Atlantic. Once they brought back gold and slaves, the voyages became remunerative. Within a century, Africans composed a tenth of the population of Lisbon, a city still underpopulated from the Black Death of the previous century.

Henry died before Bartolomeu Dias rounded the Cape of Good Hope in 1487, but by that time explorations down the coast of Africa had found other royal patrons. When the Portuguese mariners got below the equator, the North Star was no longer in the heavens, which meant that they had to develop new celestial navigation with the Southern Cross, the constellation visible in the Southern Hemisphere almost any time of the year.

Adding to the pressure to find a sea route to the Indies was the fall in 1453 of Constantinople to the Ottoman Turks, who closed off trade with Europe. Bringing in cinnamon, cloves, nutmeg, and pepper on overland routes became more costly and more fraught with peril. Going by water to the fabulous islands could cut out the Arab merchants who acted as middlemen. Having discovered the winds that would carry ships around the tip of the continent, Dias opened

the way for others to reach the East Indies. A generation of sailors from the ports of Italy and the Iberian Peninsula could now follow where the geographic pioneering of Henry had pointed.

With prospects for great success, the Portuguese king had no compunctions about rejecting appeals for support from a Genoan named Christopher Columbus, who had a different idea about reaching the Indies. Discouraged, Columbus turned to Spain, where Queen Isabella and King Ferdinand had just joined their kingdoms to form a united monarchy in Spain. As rivals of Portugal, they sought a different route to the fabled riches of the Orient and offered to sponsor Columbus's expedition. Even more important to the devout queen than catching up with the Portuguese was the possibility of extending the realm of Christendom in Asia. Columbus shared this goal. He extracted promises from them to receive 10 percent of all the goods found in the lands. His son wryly noted years later when the family was fighting over what they thought was due their father that the monarchs had probably not expected him to get back alive. But he did, after a seven-month round trip to the Caribbean.

News of the discoveries in the Western Hemisphere arrived when Europeans were still absorbing the philosophy of ancient Greece and Rome. After being cut off from these stores of knowledge and wisdom for a millennium, scholars acquired access to them through the libraries of the Muslims in Córdoba. The rebirth in the term "Renaissance" refers to the flowering of art and literature in response to this recovery of classical texts. After the Turks took Constantinople, many Greek scholars moved to Italy, bringing with them a thorough understanding of the Greco-Roman writers whose worldly perspective was so different from the spiritual otherworldliness of medieval Europe....

Ancient writings brought in a questioning attitude that startled with its intellectual insouciance. They bristled with inquiries, hypotheses, and stratagems for proof. To read them was to reassess what one thought one knew. The freshness of this engagement has to be measured against the medieval obsession with doctrine, form, and faithfulness to sacred texts. An appreciation of the Greek and Roman philosophers, like news of the voyages of discovery, moved from the fifteenth-century preserve of classicists to a wider group of educated readers with the publication of translations of the texts....

Europeans began studying the recovered works of Ptolemy, the first-century Greek who had collected in one volume all the geographic knowledge that had been acquired in his Greco-Roman world, just as the discovery of the New World was making more salient than ever how little they actually knew about the planet they lived on. With an old text and a new map, they began delving into just those subjects that Augustine had excoriated, Even Spanish churchmen who followed in the wake of the explorers became curious. They justified this new intellectual trait on the grounds that none of their authorities—biblical or ancient—knew anything about these strange continents accidentally discovered on the way to the Orient.

An avid appreciation for ancient philosophers created a whole new category—that of the humanists, who cultivated classical ideas and styles through

a rigorous study of Greek and Latin. Greek and Roman thinkers had been famously curious, asking a myriad of questions about the heavens, the planets, and earth's human inhabitants. Reading their works couldn't but nurture an investigative spirit. Responding to this, the humanists formed clubs to talk about the knowledge gleaned from the recovered texts. Their growing numbers signaled a discontent with the inward, logical reasoning of the Scholastics, who were the principal interpreters of the Christian dogma that had dominated thinking since Augustine's time.

The new focus on the classics was not like sailing off into the Western Hemisphere, but studying Greek philosophy prepared some to ponder the puzzles that the discoveries turned up. Especially startling was Europe's new location on the globe, no longer joined to the Middle East and Asia through a vast land bridge, but separated from Asia by two huge oceans and the linked continents of North and South America. Maps had to be redrawn and redrawn again as successive explorers returned with new sightings. Ironically, the fact that the existence of the New World was unknown to the ancient writers dented their reputation a bit. Greek geographers had planted serious doubts about there being life near the equator. Desiderius Erasmus, the great Dutch humanist, wondered in what other ways the ancients might be in error. This attitude of questioning, if pressed too far, led to conflicts with the Scholastics.

Turning toward this world, as ancient learning encouraged the humanists to do, meant attending to the objects people encountered every day—the animals, rocks, mountains, trees, and stars—not to mention fellow human beings. Leonardo da Vinci's many anatomical drawings exemplified this new fascination with the here and now. His accurate depictions of the human body merged art into scientific inquiry. Not until the nineteenth century did philosophers, mathematicians, artists, and scientists go their separate ways. For three centuries, gifted amateurs in all these fields took the lead in examining natural objects, both domestic and foreign.

Printing with movable type, introduced in the second half of the fifteenth century, made the reproduction of writings and illustrations much less expensive than the written manuscripts that had preserved texts before. During these same decades, the reading public expanded with the switch from Latin to vernacular languages. Publishing and literacy enhanced one another as the catch basin for communication widened. The divergence of Greek learning from Christian cosmology added to the intellectual turmoil from the discovery of the New World. More and more men and women had to cope with the intrusion of novelty, but it would be a mistake to exaggerate the immediate impact. Still, there was a momentum going for new initiatives in exploration.

Greeks had long pointed to the Pillars of Hercules, the promontories flanking the Mediterranean's opening to the ocean, with the warning *ne plus ultra*—go no farther. Portugal and Spain, facing the Atlantic, became the obvious kingdoms to reject this advice. During the 1580s and '90s the Portuguese had been building victualing stations on African islands and for their commercial fleets en route to the trading centers in the East Indies. Meanwhile, a French navigator, Jean de Bethencourt, sailing for Castile in 1402, conquered the

Canaries, which lay some 1,200 miles from Cadiz, winning for the Spanish a key station in the Atlantic. From the Canaries Spanish sailors could catch the best winds to carry them west. By the end of the fifteenth century, monarchs and financiers were ready to open up their purses to expeditions that would explore the world by sea.

Like Prince Henry, Columbus studied navigation. He made maps to depict his conjectures of what the globe really looked like. He also got in touch with Paolo de Pozzo Toscanelli, a Florentine astronomer and geographer of note, who had come into contact with writings long lost to Western Europe. Lorenzo the Magnificent had summoned an ecumenical council in 1439. The thirty-one Greek bishops who attended this extraordinary gathering brought with them the knowledge of ancient philosophy that had been preserved in the Byzantine Empire. They knew the speculations and experiments of the inquisitive Greeks. Toscanelli talked to these bishops in Florence, reigniting his zeal to figure out the shape of the earth.

It was one thing to know that the world was not flat and another to have an accurate idea of its size and shape. Europeans had neither. Worse, their heads were full of hideous pictures of what lay beyond the waters that lapped at their shores. Only with the great persuasive powers of a prince of the realm had Henry the Navigator got his sailors to press farther down the west coast of Africa. Most people believed that fantastic creatures inhabited the Ocean Sea, as they called the Atlantic. Others were sure that the bottom teemed with sinners who were burning in a molten mass that could suck in vessels that sailed out too far. Access to the writings of Strabo, a first-century Greek, dissuaded Toscanelli of the existence of these terrors. Strabo insisted that there was one world and it was habitable and its landmasses were joined by the Ocean Sea. Toscanelli went further and said that it would be possible to sail from Europe to India along the same parallel.

Men with grand visions like those of Columbus had existed before; he succeeded in implementing his plans because financiers, merchants, and monarchs—usually given to caution—responded positively to his outsized ambition. Columbus's plan contained two errors: he calculated that Japan was 2,400 nautical miles from the Canaries when it was actually over 10,000. As problematically, he did not anticipate there being a landmass between Europe and Asia! With the confidence of ignorance, he departed in August 1492 with some 120 men dispersed among two little caravels, the *Niña* and the *Pinta,* and the larger *Santa Maria.*

Ardor for heroic adventures may have helped suppress the fear of Columbus's seamen for what lay beyond the coastal waters. His sailors were lucky that Columbus knew about the clockwise circular wind patterns of the Atlantic, which would get them back home before exhausting their food supply. Elated by his success in making a landfall after nine weeks, Columbus sailed home convinced that he had found a landmass not far away from Asia whose store of riches he had read about in his favorite text, *The Travels of Marco Polo.*

In 1497 the king of Portugal commissioned Pedro Álvares Cabral to strengthen contacts with Asian merchants, sending him off with a fleet of

thirteen ships. Blown off course in a storm, Cabral landed in Brazil and forthwith claimed it for Portugal before pushing on to India. Eager to tamp down the already disruptive competition between the two Catholic countries of the Iberian Peninsula, Pope Alexander VI had divided the globe between Portugal and Spain. Now he had to make a large jag in the established line (longitudes were then guessed at) to honor Portugal's new possession.

Columbus's discoveries were extraordinary enough to batter at the wall of inhibitions that surrounded questioning of Christian cosmology. There was no place in the European system of knowledge to fit in the plants, animals, minerals, and humans he brought back. They challenged settled opinions and provoked unbidden questions; they tugged at the roots of faith. The voyages of discovery proved to be the catalysts for breaching the church's curbs on curiosity, but it took time.

The intellectual consequences of Spain's venture across the Atlantic long outlasted its empire. Slowly the age-old concern with acquiring wisdom through contemplation was pushed aside in the pell-mell search for mundane details about the earth and its contents. Old ways of knowing were turned upside down. A passion for collecting information through observation, measurement, and description of new phenomena grew stronger, though it took successive generations to generate hypotheses about their meaning. This new form of pursuing information opened up the doors of inquiry to less educated amateurs, once excluded from the closed circles of the Scholastics and humanists who had to master ancient languages.

The engagement with natural phenomena involved Europeans in an inquiry about sex and sexuality. The nude bodies of the Amerindians provoked questions about the meaning of nakedness. Innocence and barbarity competed as answers. When explorers encountered willing sexual partners in the New World, their reports led to a new discourse about sexuality. Nor were sexual questions confined to humans. Botanists would use reproductive organs to categorize plants, and the sexual exclusivity among animals became the way naturalists defined species. Reproduction and the incorporation of new traits in the lineage of living things would form the basis of Darwin's explosive explanation of human origins, bringing to a climax the four-century examination of natural phenomena that the discoveries of the world outside of Europe provoked.

No one had any idea of what would happen if ships sailed west across the Atlantic. Columbus's sponsors certainly did not expect the most significant unintended consequences of all: the breaking open of the closed world of Christianity. A civilization marked by a reverence for sacred texts so deep that it disallowed questions about natural phenomena became the trailblazer in inquiries about nature. The Church Fathers had been correct. Curiosity was dangerous. Passing from amateur passions to sober investigations of biology, geology, and astronomy, it upended the grand Christian narrative of the origins of life and the place of our planet in the universe. Over the course of four hundred years the research spawned by Columbus's discovery of the New World set Europe apart from any other society on the globe, and, even more, from its own past.

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