Historical Overview: Continuity and Change in the Indian Ocean

Table of Contents

Description of the Indian Ocean

The Indian Ocean touches Asia, Africa, Australia and Antarctica. It also connects and links the Continents called the Old World, in contrast to the New World, which is touched by the Atlantic, Pacific and Arctic Seas. The Indian Ocean covers 68,536,000 square kilometers (about 26 million square miles), which equals about a 20% of the world's ocean surface. It is the third largest of the world's oceans, according to the International Hydrographic Organization (IHO). The other four are the Pacific (155,600,000 square kilometers), the Atlantic (82,362,000 square kilometers), the Arctic Ocean (14,056,000 square kilometers), and the Great Southern Ocean (20,327,000 square kilometers).

Physical Geography

The shape of the Indian Ocean can be described as a huge letter "M." Its outline extends from the East African coast north to the Arabian Sea, down the western coast of India to Sri Lanka, and up India's eastern coast, where it forms the Bay of Bengal. The eastern arm of the M is formed by the Indochina Peninsula, the Island of Java, and the west coast of Australia. This letter M covers the area between the Tropic of Cancer in the Northern Hemisphere, past the Tropic of Capricorn in the Southern Hemisphere to the line of 40 degrees S latitude. According to the IHO and the *United Nations Oceans Atlas*, the area from 40 degrees S latitude to 60 degrees S latitude is included in the Indian Ocean. The area that encircles the globe from 60 degrees S latitude to the coast of Antarctica is called The Great Southern Ocean. The Indian Ocean's width extends from 45 degrees E longitude to 110 degrees E longitude.

The Indian Ocean region is larger than the geographic description of this body of water. The region includes coastlines of the Indian Ocean where people live who work on and from the sea. It also includes waterways that connect to the Indian Ocean and link important places where trade originated and distant ports where goods were carried. The larger region important to the story of the Indian Ocean includes three bodies of water in the west: the Arabian (Persian) Gulf, the Red Sea, and the Mediterranean, which linked Europe, Africa and Asia. In the east, the region includes thousands of islands east of the Strait of Malacca, the area between Southeast Asia and Australia that leads to the Pacific. The South China Sea is somewhat like the Mediterranean, because of its connection with East Asia, the source of many important products, migrating peoples, cultural influences and technologies that affected the Indian Ocean.

Climate

The rim of the Indian Ocean that touches the continents of Asia, Africa and Australia lies mostly within the tropics. This means that all of the ports and bays on the ocean are free of ice all year round. There was no Ice Age in the Indian Ocean, so this zone was always habitable by human populations. The Ice Age affected the ocean in some ways, changing the amount of rainfall, the temperature, and especially, the shoreline. During the Ice Age, the huge island group in Southeast Asia was connected to mainland Asia, almost all the way to Australia.

The Indian Ocean has a unique climate pattern based on seasonal exchange of air masses between land and sea. This pattern is called the monsoon, from the Arabic word *mawsim*. During summer,

when the land masses are warmed by the sun's heat, air masses over the huge continent of Asia rise, pulling in air masses saturated with moisture from the Indian Ocean south of Asia.

The monsoon wind then blows from the southwest. During winter, the warmer air masses over the ocean pull in dry air masses from Asia, and the wind blows from the northeast. The tropical monsoon climate, combined with natural links across land and sea, made the Indian Ocean a place rich in plants and animals unique to this part of the world. Spices, tropical fruits, rare jungle animals, and sea creatures became rare and exotic products and natural resources that became valued items of trade, and material for real adventures, travel stories, and tall tales.

How Historians Think Geographically

Oceans are the opposite of land masses in usual geographic thinking. Oceans have no landmarks like mountains, plains, valleys, and plateaus. For seafaring experts, of course, oceans have clear patterns that are not visible to landlubbers, such as winds, currents, and reefs. Historians study the story of human settlement and civilization, and so they focus on the land, *terra firma*. That is where farming, herding animals, cities, and towns are located. Historians have long studied rivers and inland seas as links, but oceans were thought of as barriers to people. The coastline was the edge of human existence.

World historians have recently become more interested in the world's oceans as connectors. There is plenty of evidence that people explored the seacoasts very early in human history, and that humans actually went to sea in rafts and boats to fish, and then to trade along the coasts. Even thousands of years ago, people were already sailing out into the oceans. As much as four thousand years ago, seafaring ships were large and strong enough to cross into the open oceans—and navigation skills were advanced enough to bring them back to tell the tale. Another important quality of the oceans is that unlike territory that could be taken over and controlled by armies, it was much harder to control the coming and going of ships. So oceans have been freer zones of interaction than land regions.

The evidence collected on each era of Indian Ocean history for this website illustrates a wide variety of interactions that took place during more than ten thousand years of human history, and a much longer prehistoric period. People migrated and traveled, traded and transferred ideas and technologies, engaged in warfare and peacemaking, spread religions and artistic ideas. Each era of history in the Indian Ocean was different.

Read the short sections below as background to your exploration of each era's map icons on "The Indian Ocean in World History" online resource. Under the heading and dates for each era, the reading describes what historians believe happened during each era, how interactions developed, how navigation technologies and routes changed, what groups and individuals played roles in the region, and what places were important then. Read what goods were produced and traded, and how cash and food crops were carried across the region over time. Learn about important ideas and belief systems that migrants, pilgrims, merchants, conquerors and ordinary people spread across the Indian Ocean lands. The readings also give clues to what historians don't know yet, and where they disagree about historical trends.

Prehistoric Era, 90,000 BP to 5000 BCE: Human Migration Around the Indian Ocean

How the Ocean Came to Be

The Indian Ocean became an enclosed sea by the action of Continental Drift. This theory of earth's formation is also called Plate Tectonics. According to this theory, the landmasses that form the continents moved over millions of years of geologic time, as plates, or sections of earth's crust separated and pushed against each other. India, Australia, and Antarctica separated from the ancient super-continent called Gondwana and drifted toward their current locations. The Indonesian islands separated from the continent of Asia, and Madagascar drifted away from Africa. In the process, mountains were pushed up, like the Himalayas, and they are still rising, forming the highest peaks in the world. The Mediterranean and the Red Sea formed as the complex plates in what is today the Middle East shifted and collided. Earthquake zones are still active there today. Though these changes are still happening, continental drift is very slow, and major movements of the continents happened on a geologic timescale far longer than human history.

Changing Climate on Earth

Climate change, in contrast, is on a shorter time scale. Change in earth's warming and cooling patterns has affected plants, animals, and human history a great deal. Ice ages and periods of warming have been traced through study of Antarctic ice cores, giving a picture of the past 400,000 years. During much of this period, temperatures were between 4 and 8 degrees cooler than today's average, but there were several major warming spikes. These changes made a big difference in earth's tropical zones, though they may seem small to us. Such changes affected rainfall, the extent of deserts and grasslands. They affected sea levels around the world, which fell as more water was locked up in polar ice caps and glaciers. This action exposed land that had been under water. Sea levels rose in periods of warming, creating islands where dry land had been. The picture of climate change over the past 70,000 years is a general trend of cooler temperatures than today. Since about 20,000 years ago, however, the climate has been warming significantly. At the Last Glacial Maximum (LGM), ice sheets during the last Ice Age reached their maximum size, then stayed at that size for several thousand years. Climate changes affected regions of the world where early human migration out of Africa began. It determined where forests and edible plants could grow, and where herds of large animals found rich grasslands. Plants, animals and human populations adapted, migrated, or died out during these periods.

Peopling the World

The major event of the prehistoric era is the spread of human population to all of the continents. Over 160,000 years ago, modern human beings lived in Africa. Scientists no longer believe that many different populations emerged around the earth, since genetic similarities among all humans point to a common origin. Between 160,000 and 135,000 years ago, groups of people spread out in Africa. About 150,000 years ago, when the Sahara was greener, people moved up the Nile Valley and into the eastern Mediterranean. By 90,000 years ago, a cold climate phase had caused them to die out. Neanderthal humans probably migrated to this region later. Between 90,000 and 85,000 years ago, a group of people migrated from Africa into the Arabian Peninsula through the Bab al-Mandeb, which means "Gate of Grief."

All present-day humans are thought to descend from this group. These people—identified today by the traces of their genetic relationships to current people—made their way along the Red Sea and crossed onto the Arabian Peninsula. From there, they moved across the Strait of Hormuz to Asia, tracing the shores of the Indian Ocean. Leaving behind shell middens, they moved slowly, generation after generation, until their descendants reached Southeast Asia and China. Sea level was lower then, and where the Indonesian islands are today was mostly dry land. By 65,000 years ago, people had crossed over a narrow waterway to Australia and New Guinea. Farther north, warmer climate around 60,000 to 50,000 years ago allowed people to migrate into Southwest Asia, populating the Fertile Crescent and southern Europe. By 25,000 years ago, people had migrated deep into Australia, and into Central and Northern Asia as far as Siberia. By about 20,000 years ago, people migrated into North America, across a land bridge that connected it with Asia at that time.

Beginning of Farming and Humans on the Sea

Gradual warming after 20,000 B.P. (the LGM) meant important changes for Indian Ocean history. Sea levels were about 150-100 meters lower than today, but they rose, and by 8000 to 6000 B.P., areas that were dry became seas, such as the Arabian (Persian) Gulf. The weather became wetter, and the monsoon rains were intense. Seafood must have increased, along with edible plants. A somewhat drier period followed after 6000 BCE. Between 10,000 years ago and 6000 BCE, farming emerged in several places around the Indian Ocean. The earliest known sites are in Southwest Asia between the Nile and the Tigris-Euphrates Rivers—the Fertile Crescent, then the Indus Valley and Southeast Asia. Grains such as barley, wheat, and rice were early crops. Recent evidence points to New Guinea and some other islands as places where yams and bananas were cultivated. Fishing and gathering shellfish from the seacoast were early activities in or near the ocean that persist today. Migrations must have required boats or rafts to cross short stretches of water. Few indications have been found. During this time, people living near the sea became familiar with the patterns of wind and rain and the shift of seasons that would lead to experiments on the seas.

Ancient Era, 5000 to 1000 BCE: Early Seafaring and Trade

Trade among the lands and along the coasts and estuaries (river mouths) of the Indian Ocean began long before the rise of agriculture. Trade originates locally with the exchange of goods among individuals. Trade expands with migration and the spread of information about different resources available in other areas. Salt, metal, types of useful or decorative stone, wood for building, and foods were among early trade goods transported on land, river, and coastal routes. This trade, along with fishing, is one of the continuous threads in human history from earliest times to the present day. These simple exchanges paved the way for longer and more daring voyages, and helped trade to expand and persist over time. Sea routes, as they expanded over time, existed alongside overland routes, and often connected to them, bringing goods produced on land to shore, and carrying imports into the lands beyond the coasts.

Oceanic voyages began in the eastern and western parts of the Indian Ocean. In Southeast Asia, the thousands of islands between the peninsulas of the Southeast Asian mainland and Australia were home to early mariners sometime before the first millennium BCE. Distances between the many islands were short, and the seas relatively shallow. The wild winds of the open ocean were tempered. The climate was tropically warm all year round. The irregularly shaped islands had many coves and harbors. Tropical forests provided tall trees whose wood was resistant to rot, and many other resources. It was a well-protected environment for experimenting with boat-building and learning winds, currents and navigation. The Austronesians, as they are called, were the ancestors of mariner-migrants in many places around the Indian Ocean and in the Pacific. These early mariners carried crops such as yams, coconuts, bananas, sugar cane, and taro-root, as well as other rare plants, to new homes. Beginning with logs lashed together, or dugout canoes, ships in the region developed into sea-going craft. A unique feature of their boats was the outrigger, a log attached to poles alongside the main hull, which kept the boat from rolling in heavy waves. Coconut fiber ropes held the parts together. Woven grass and fiber mats held on masts developed into flexible sailing systems that allowed the boats to maneuver with the wind.

On the western end of the Indian Ocean region, the river valley civilizations of Egypt, Mesopotamia, and the Indus Valley began to trade by sea. Artifacts and inscriptions dated to between 4000 and 3000 BCE show that trade from Mesopotamia along the shores of the Arabian Gulf took place. With the rise of civilizations and division of labor, the need for different types of goods and the demand for luxuries increased. Resources such as wood, stone for carving and jewelry, metals for war and crafts, and fine ceramics attracted early traders and royal expeditions. Cotton goods and wool, copper, gold, silver and turquoise, pearls and coral from the sea were among the goods. Surplus grain from Mesopotamia was an important export. From the gulf, Sumerian traders ventured along the coast into the Indian Ocean, making contact with traders in cities of the Indus Valley. Weights and seals show that trade became more organized, and with the appearance of writing systems, records of voyages, lists of goods, places and royal expeditions testify to trade.

Mesopotamian societies traded with Egypt across the Eastern Mediterranean around this time, using both overland and coastal routes. The domestication of the camel helped join coastal water routes with land routes, and joined bodies of water across the desert. From Egypt, mariners set out along the Red Sea coast, and gradually learned to navigate its dangerous reefs, rocks and winds. Trade along the coasts for fish, shellfish, and other goods expanded to include rare items from Africa such as

animal skins, feathers, and ivory. Queen Hatshepsut of Egypt sent an expedition south into the Red Sea in 1493 BCE which reached the land of Punt, near Somalia. It returned with incense, plants, animals, rare woods, and ivory. From the Horn of Africa, ships may have started down the coast of Africa, or out into the Indian Ocean, but it is not known for sure. Ancient ships of Southwest Asia and the Mediterranean developed from river craft to meet the challenges of deeper coastal water and winds. From dugout logs to bundles of reeds lashed with rope, boats developed into ships made from wooden planks held together with pegs of wood or stitched with rope, with caulking to make them watertight. Planked ships may have been built as early as 3000 BCE. The ships had sails made of linen or matting, with ropes of twisted palm fibers. Sailing and rowing craft also set out in other lands, coasting over long and short distances to carry necessary goods, in India and Southeast Asia, but these early mariners left no traces.

Classical Era, 1000 BCE to 300 CE: Contacts and Trade Expand

By 1000 BCE, the picture of trade in the Indian Ocean becomes clearer, with many more written records and artifacts. Always keeping in mind the local and regional coasting trade in all settled parts of the ocean, long-distance trade expanded greatly in the 1300 years from 1000 BCE to 300 CE. The monsoon wind pattern became well established during the first millennium BCE though it may have been discovered as early as 3000 BCE. With the discovery of the seasonal monsoon winds, combined with the ability to navigate by reckoning with the stars, mariners now sailed across the Arabian Sea in open water. During the third and second centuries BCE, Indian and Arab ships are known to have sailed directly from Southern Arabia to the Malabar (western) coast of India and back. About the same time, in the eastern ocean, Austronesian mariners sailed toward the West. They reached India, and mysteriously, they settled on the East African island of Madagascar. Evidence comes from the Malagasy language, crops like banana, coconut, and yam, and construction of houses in Madagascar. There is little evidence of return voyages, however, or communication.

Historians think that long-distance trade from Egypt and Mesopotamia may have declined around 1000 BCE. During the second half of the millennium, trade expanded among new groups of people. Greek and Roman sailors and traders entered the Indian Ocean after 500 BCE, sent there by the Persian ruler Darius I. Alexander the Great sent Nearchus from the Indus to the Arabian Gulf in 326 BCE, and other Greeks sailed to India and around the Arabian Peninsula to Oman. The Phoenicians may have circumnavigated Africa, but they probably did explore some of the West African coast. The *Periplus of the Erythrean Sea* from the first century CE names many ports, lands, and goods in the Indian Ocean, including information about the east coast of Africa and of India. Mediterranean traders and mariners entered a system in the Indian Ocean that was already developed. Goods from China and Southeast Asia appear in records of trade with India. India exported many goods, and imported silver, copper, and gold. Several strong states existed at this time, including the Mauryan Empire (323-185 BCE) of India, the Persian Empire, the Roman Empire in Europe, and the Han Dynasty in China. Roman coins have been found in Indian hoards with Indian coins. Cloth, ceramics, pottery, metal wares, glass, beads, incense, rare woods, and spices, pearls and coral were traded alongside common goods, and have been found at archaeological sites on the Indian coast. Silk traveled overland between Rome and China during the Han dynasty, but also appeared on the sea route. Goods were portaged across the Isthmus of Kra on the Malay Peninsula to reach the South China Sea. Crops such as sugar cane, cotton, sesame, and rice were grown for export with irrigation, and became known elsewhere through the Indian Ocean trade.

A major story of the Classical Era is the spread of religions. Between 600 and 300 BCE, Hinduism, Buddhism, and Jainism spread across the Bay of Bengal to Southeast Asia. Pilgrims' and missionaries' travel accounts tell about journeys in search of knowledge and to found religious communities, collect sacred texts, and visit shrines. Sacred texts influenced languages, scripts, Storytelling material and deities were exchanged among Indians and Southeast Asians. Construction of temples influenced the arts and architecture. Merchant communities spread the religions more widely. Religious exchange also took place at the level of royal courts, supporting dynasties, diplomatic and military interactions. The rise of Judaism and Christianity during the Classical Era also resulted in migrations of both groups to colonies in Ethiopia, Arabia and India. Jewish and Christian communities in India today claim links to those early groups.

Historians are cautious about imagining the Indian Ocean as a huge arena of circulating trade during this time. They stress that most people still lived on the land, and empires drew most of their wealth and strength from land. Still, trade and travel on the seas played a gradually expanding and important role, both locally and over longer distances. Long-distance trade routes such as the Silk Road set the stage for expanded trade between east and west. Wooden ships of different regional styles and sizes with oars, and with linen, cotton, bamboo and matting sails grew larger to carry heavier cargo. Navigation arts developed with astronomy and knowledge of mathematics and geography.

Medieval Era, 300 CE to 1450 CE:
Networks of Exchange Across the Hemisphere

Two major changes on the eastern and western ends of the Indian Ocean affected trade in the period from 300 CE to 1450 CE. In China, the Tang and Song Dynasties (618-1279 CE) reunited large areas of China and began a time of prosperity and development. Some historians compare it to an industrial revolution. Earlier dynasties had built up tribute trade systems with Central Asian nomads and developed the Silk Road trade. Under the Tang and Song, maritime trade grew rapidly. A bureau of trade was established and an Imperial Navy to protect against pirates. China received Indian Ocean goods such as spices and cottons, and exported porcelain and silk. A new variety of rice from Southeast Asia increased production and nutrition for the Chinese people. Tang rulers encouraged trade, industry and river transport to bring goods to port. According to Tang sources, 4,000 ships per year visited the port of Guangzhou (Canton). Though foreign merchants were kept from mixing with the Chinese, the port became a cosmopolitan place where Christians, Jews, Muslims, Zoroastrians, Buddhists and others lived and kept houses of worship. Religious tolerance was celebrated on carved stones, or stele. Buddhism spread and became a popular religion in China, and pilgrims traveled on land and sea as scholars and missionaries. Later Tang rulers were less tolerant of religion and trade, but it revived under the Song after 960 CE. Spices, silk, sandalwood and rice were traded. Tea and porcelain, or "china," in which to drink it became common luxury exports. The Mongol invasion disrupted China in the 13th century, and invasions of Southeast Asia and Japan took place under the Mongol Yuan dynasty. The Ming dynasty (1368-1644 CE) restored Chinese rule. In 1405, they began the great maritime adventure of the Ming Voyages under Admiral Zheng He. These five voyages with hundreds of huge treasure ships visited ports from one end of the Indian Ocean to the other.

In the western part of the Indian Ocean, a major empire rose after Muhammad (d. 632 CE) brought Islam to the Arabian Peninsula. A century of rapid expansion brought huge territories under Muslim

rule. The Umayyad and Abbasid Empires controlled territories from Spain in the west to the borders of China in the east. In the following centuries, both Islam and the Arabic language spread through much of this territory. The Arabs had already been active traders in the Indian Ocean, and Islam encouraged trade and created opportunities as it spread a universal belief system, Arabic language, and a system of law. Sufi mystical orders or brotherhoods spread and popularized Islam along the trade routes, and annual pilgrimage journeys to Makkah reflected a diverse and growing Ummah, or Muslim community carrying out this religious duty. The Muslim lands, with their growing cities, were wealthy and demand for goods of all kinds was high. Like the Chinese at the time, science, learning and the arts were prized, and production rose. Crops such as sugar, rice, hard wheat, vegetables and fruits spread from east toward the west. All sorts of imports flowed into the Arabian (Persian) Gulf and the Red Sea, and exports flowed out. Recent finds of shipwrecks from the medieval period are beginning to show the large volume of this trade, which travel accounts have described in detail.

No Muslim empire set out to control trade in the ocean, but merchant communities spread widely, and through them, Islam spread around the lands bordering the Indian Ocean. It spread along the Silk Road and into West Africa. Arab and Persian traders stopped at ports in the growing East African city-states, where a Swahili, or coastal, culture combined African, Islamic and regional influence. Trade on the Red Sea and Arabian (Persian) Gulf linked to land routes and the Mediterranean trading system. Byzantine, Persian, and Italian traders carried goods into the western and northern lands. Crusaders from Europe occupied the Eastern Mediterranean during the 11th and 12th centuries, but when they left, they carried a taste for eastern goods with them, and demand grew.

India was the central hinge for trade in the medieval era. On the Malabar and Coromandel coasts, in Gujarat in the northwest, and Bengal in the northeast, colonies of traders from an astonishing mix of places gathered to trade cottons and silks, spices and perfumes, gold, silver and ivory, and hundreds of other goods, fancy and simple. Indian manufacturing, especially of beautiful and practical cloths, boomed. Indian traders from Gujarat and other areas went out in search of goods, bringing together a mix of cultures and a practical tolerance that allowed prosperity for all. The Gupta (320-550 CE) and the Chola Empire (800s to 1300s CE) were major Indian powers with wide influence and prosperity.

The Malay and Southeast Asian regions were active in this time. Traders used the route to China through the Strait of Malacca, and several shipwrecks show the huge quantity of goods that flowed through. Southeast Asian states at Angkor, Srivijaya and the Majpahit carried, contributed and imported goods and centered cultural activity like the building of great temples at Borobudur and Angkor Watt. During this era, between about 300 and 1200 CE, the Austronesians migrated into the Pacific Ocean, eventually populating the islands of Polynesia and Micronesia as far as Hawaii.

Ships and navigation flourished during this time, with many inventions spreading with the circulation of goods and people. Arab dhows made of teak sewn with coconut fiber carried triangular sails and stern rudders. They navigated with instruments like the kamal and the astrolabe, and pilots wrote exact records of their routes. Indian and Malay ships suited to their trading journeys and need for protection can be seen on temple carvings. The Austronesians' prahu, or prau had unique, wing-shaped sails, outriggers and they navigated by signs and stick charts. Chinese junks in sizes from large to huge were the 18-wheeler trucks of the Indian Ocean. Their hulls had watertight compartments, stern rudders, comfortable apartments, and many masts with bamboo matting sails. The Chinese introduced the mariner's compass, an innovation that moved across the ocean toward

the west, from the Arabs to the Mediterranean and Atlantic. Pilot charts, knowledge of astronomy and use of mathematical geography led to maps using coordinates for cities and landmarks. Archaeology, travel accounts and official records have filled in the picture of a time when trade flourished in the Indian Ocean and gradually drew many more regions into its orbit.

Global Era, 1450 CE to 1770 CE:
Indian Ocean at the Beginning of World Trade

Events happening far beyond the region brought significant changes to the Indian Ocean in the period after 1450 CE. Ironically, the flow of goods, technologies and belief systems from the Indian Ocean over centuries were in part the cause of those very changes. The entry of Western and Northern European mariners into the Indian Ocean was a series of events that caused significant changes in trade and other exchanges during the First Global Era.

By the 13th century, European cities were growing, and knowledge of the sources of luxurious spices, silks, jewels, carpets and metalwork from lands east of the Mediterranean increased demand. Marco Polo's journey to China and his return via the Indian Ocean was celebrated in a popular book. These luxury goods reached European market towns, but the goods changed hands many times along the way, and prices were high. Italian, Muslim and Armenian merchants were the middlemen, making good profits. Everything came through Mediterranean ports, including knowledge of commerce, ships, and faraway lands. Sources of gold were known to exist beyond the Sahara in Africa. Muslim-ruled al-Andalus (Spain) was another entry point of knowledge and technology, with its rich trade and libraries.

When Spain fell to Christian Spaniards and Portuguese from 1085 to 1492 CE, knowledge about navigation, maps, engineering and other fields passed into Europe through translations from Arabic into Latin. At the same time they were defeating the Muslim rulers, the Portuguese and Spanish, with help from some Italian mariners, experimented with voyages along the coast of West Africa. It took almost a century, but in 1492 and 1498, Portuguese and Spanish seafaring experience and knowledge resulted in ships and navigation techniques that carried the Spanish to the Americas across the Atlantic, and the Portuguese into the Indian Ocean by sailing around Africa. As they did so, they established the Atlantic slave trade and built colonies with their labor.

When they arrived in the Indian Ocean, the Portuguese brought with them a desire for wealth, conquest and victory of the Catholic Church. Islam was especially viewed as the enemy. The Spanish went with the same vision to the Americas, and brought it to the Indian Ocean when they conquered the Philippines after Magellan crossed the Pacific Ocean in 1519. They arrived with cannons fixed on the decks of their carracks, bearing both square and triangular sails. What they lacked in fine goods to trade, they made up with force and threats of violence. After 50 years, the Portuguese occupied port cities in east Africa, on the Malabar coast, at Hormuz, Melaka, and Macao, an island near the Chinese port of Guangzhou, where they traded Japanese silver to China. They tried to control the spice trade and issued permits to any other ships on the routes, or else sank them. The Portuguese met resistance from the Ottomans, the Ya'ruba of Oman, the Gujaratis of India, the Acehnese of Sumatra, and others. The Portuguese did not succeed in controlling the enormous Asian trade, but they made an impact. They gradually accommodated to local ways of trading.

In Europe, the Dutch entered the Indian Ocean as the Dutch East India Company (VOC) in 1602, with the idea of challenging Portuguese power and gaining wealth for themselves. In 1641, the Dutch took Melaka, and Portuguese power declined while theirs rose. They took Cape Town, Ceylon and Formosa. They enforced a new monopoly on spices by taking over the islands that produced them. The VOC was dominant in the Indian Ocean until 1680. The British entered about the same time as the Dutch, chartering the East India Company (EIC) in 1600. They did not at first imitate the violent

behavior of the Portuguese and Dutch, but established trading "factories" or warehouses in India at Bombay, Calcutta and Madras in the 1600s. The French and Danish followed as smaller players. From 1680 to 1740, the British gained the advantage in the region, taking advantage of growing European demand for cotton and silk cloth, coffee, and tea. Later, they made inroads on Dutch territory and the spice trade.

Throughout these centuries, trade with Europeans was not an exchange of European for Asian goods. Europeans did not have desired goods to trade in Asia. They had to pay in silver or gold. English success came from developing triangular trades. This was what other groups in the region had always done. Buying cloth in one place, they sold it for spices in another. Indian cloth, American goods, and cowry shells went to purchase West African slaves. The British traded opium, a strong narcotic drug, from India for costly Chinese goods such as tea, silk and porcelain. Finally, though, the Europeans had to pay for luxury goods with gold and silver, much of it from America. Without this, their role in the Indian Ocean would have been quite small.

Between 1600 and 1800, the European role in the Indian Ocean became more dominant. They developed finance and banks, improved ships and weapons, and gained footholds with the rulers of lands where they traded. Empires like the Mughal, Safavid and Chinese were weakening in the face of growing European power. The East India Companies actually fought wars, defeated local rulers, and won rights from governments. They received taxes, gained control over production of goods, and used troops to police territories. They introduced New World crops like vanilla, maize, sugar, and chocolate to new places, and moved slaves and laborers onto their plantations to raise these cash crops, or to sail ships and colonize islands. Demand in Europe was high, and wealth from the Americas helped pay for Asian goods.

Missionary work was carried on by every European group in the Indian Ocean, and small Christian communities emerged. At the same time, Europeans began to learn other languages and study other cultures, their arts and literature. Some married local women. The Protestant Reformation brought another branch of Christianity besides Catholicism. This set European against European. Missionaries did not make many religious converts, but they spread new ideas, started European-type schools, and built churches. Religious ideas were spread through migration as well, including the continuing spread of Islam in Indonesia during this time. Chinese merchants migrated into Southeast Asia in greater numbers, bringing their culture and religion. African slaves were the largest migrant group, though European merchants and colonial officials were a small but influential group. As officials, they were responsible for projects that brought more migrants to faraway places around the Indian Ocean. Migrants settled uninhabited islands, populated Australia with Europeans, and sought their fortunes through adventures in foreign lands.

The technologies that brought European ships to and from the Indian Ocean were the compass, the stern rudder, the lateen sail, and new methods of hull construction. The navigation instruments developed in Asia were improved during the period. The wooden ships called cogs, carracks, caravels, Indiamen, and many other types grew in size, number of sails, and masts. The Europeans improved the accuracy of mapmaking, bringing into focus the true shape of the world's lands and oceans. They explored further on land and sea during this time. A highly accurate clock was invented to measure longitude at sea for navigation. Weapons like muskets and cannon gained greater power to kill and destroy forts and cities. Sailing was still very dangerous, and many ships were lost on the long voyage to the Indian Ocean from Europe. Pirates, both official and unofficial, might attack in

the Atlantic, or in the Indian Ocean. As many as 10% of ships were lost at times. As for controlling the spice trade, Europeans carried only about a tenth of Asia's total production to Europe. The rest was sold to Asians by other Asians, who sought new opportunities wherever they were found, as they had always done. Europeans died of tropical diseases, shipboard diseases, and disasters.

After 1750, methods of manufacturing of iron, ceramics and textiles began to change and become mechanized in Europe. The wealth of the trading nations brought new possibilities for agriculture and manufacturing. Demand for goods increased among newly wealthy upper and middle classes of Europeans. Money from the colonies and plantations was invested. This capital wealth was used to build up manufacturing and transportation. These changes were gradual at first, but continued in the next century at a faster pace, with powerful results.

Industrial and Imperial Era, 1770 CE to 1914 CE: Linking the Seven Seas under Western Control

During the nineteenth century, three major changes took place that impacted the Indian Ocean region. They were: industrialization, imperialism, and advances in transportation and communication. These global changes were interconnected, and it is difficult to separate the causes and effects of each.

People living in the Indian Ocean region responded to these changes in many different ways. One response was to resist imperialism and work toward establishing independent nations. Another response was immigration, some of which was forced, and some voluntary. Another response was to seek improvement of their own societies through education, writing, speaking and political organization. They made early attempts to modernize industries, but faced difficult obstacles.

Industrialization

Industrialization was the first major change, meaning production of goods in factories using machines. Britain was the first country to begin manufacturing goods in factories where water or steam-powered machines replaced the work of hands. Spinning and weaving machines speeded up production. The first factory product exported by British merchants was cloth. By the mid-nineteenth century, Britain was selling cheap, colorful, printed cotton cloth in Britain, India and the Middle East at prices much cheaper than handmade cloth. Britain had to import raw cotton from India, the United States and later Egypt. The steel industry grew with the invention of the steam engine, which was used to power both steamships and steam locomotives. Later in the nineteenth century, chemical and electrical industries developed. Industrialization began later in Germany, France, and the United States, and caught up quickly. Cities grew in Europe, and rural areas sent many laborers to work in urban factories.

The effect of industrialization was to weaken or destroy traditional craft manufacturing in the Indian Ocean region. Many artisans slipped into poverty, and whole industries disappeared. For example, the Indian textile industry was an especially sad case because British and French manufacturers had imported Indian fabrics, and the new factories had copied styles and techniques for manufacturing from Indian artisans. A few textile machines were imported into India, but the products were not allowed to compete with British goods. Another major change resulting from industrialization was that countries in the Indian Ocean region became suppliers of raw materials for European industries.

Plantations were set up to grow cash crops like tea, rubber, cotton and coffee. Mines were dug to extract gold, silver, lead, coal and iron. Forests were cut for timber. These goods were worth much less to the producer than the earlier luxury goods produced in the region. They became commodities—ordinary, bulk products. These same countries became buyers of European manufactured goods worth more to the producers. The balance of trade now tipped toward advantage for industrializing European nations.

Transport and Communication

Transportation was the second major change. Beginning 1807, steam was used to power ships. By the 1840s, problems of using steam power for ocean-going ships were solved. The screw propeller and better engines developed, and steamship hulls were made from steel instead of wood. The age of sail was ending. Steamships no longer depended on the wind. Journeys were cut from months to weeks or days. Steamships were armed with powerful guns, and industrialized nations built battleship fleets. Soldiers could be moved quickly and supplied over great distances. Travel for officials and their families was made easier as regular steamship routes were established. Tourism had its beginnings, with grand hotels in major world cities. Global time differences were standardized to time zones. Railways were important to the ocean because they carried people and heavy goods to port cities. Colonial powers built railway systems to aid in governing colonized countries and extracting resources. It is important to note that the map for the Industrial and Imperial Era does not show transportation routes on the ocean connected to those on land. They were shown for earlier eras, but the enormous growth in overland roads and the construction of railroads makes it impractical to show them on the map. Roads did continue to bring things to port cities and to carry goods into the continent, just as they always had.

Postal systems were developed in most countries and colonies. The telegraph sped the pace of communication, allowing messages sent in code to travel quickly along telegraph wires. The Indo-European Telegraph Line was completed in 1870, linking London, Teheran, Karachi and Calcutta. By the end of the 19th century, radio technology had made wireless communication possible—a boon for ships at sea. Two strategically important canals affected the Indian Ocean. The Suez Canal was completed in 1869, linking the Mediterranean and the Red Sea, making communication and trade between Europe, the Middle East and the Indian Ocean much faster by sea. Far from the Indian Ocean, the Panama Canal, constructed by the United States from 1888 to 1914. The canal would speed oceanic voyages between the Atlantic and the Pacific Oceans. With both completed, circumnavigation of Africa and South America was no longer necessary to travel around the world.

Imperialism and Colonization

In the Indian Ocean, the takeover of governments by European powers happened gradually but forcefully after 1800. The extraordinary powers of the East India Companies of the British and Dutch were taken away, the powers replaced by direct rule from Britain. Some local rulers remained in name only, but the power to govern and tax. This authority was won as weak rulers confronted European weapons and tactics. In India, the Sepoy Mutiny of 1857 was a rebellion of Indian troops against British officers. In Africa, in Southeast Asia and on the islands of Indonesia, French and Dutch were in control of colonies. China was forced to give up territory and trade and other rights after the Opium Wars.

European powers competed in the "scramble for Africa" after 1880, taking over one country after another. They were aided by weapons like quick-loading rifles on one hand, and medicines that saved Europeans from tropical disease on the other. Everywhere, the colonized people resisted with arms and with words. European colonial powers set up rules that gave advantages to European manufactured goods, and made favorable conditions to buy raw materials. This was the key to the colonial economy. Other colonial powers acted in similar ways, but Britain became the largest colonial power by far in the nineteenth century. As a result of both imperialism and transportation, millions of people in the world began to migrate to other lands.

During the nineteenth century, the Europeans justified their rule over people by explaining that they had a civilizing mission in the Indian Ocean region, to modernize lands and cultures. Ideas of European racial superiority became apparent in the colonial policies, and in what colonial officials wrote and spoke. The British, French, and Dutch did establish schools, and people from colonized countries traveled for education to England or France. There, they learned language, literature, history, and other fields. When they returned, they joined people educated in the colonial schools at home. Through these western-educated Africans and Asians, great cultural and social changes began to take place. Questioning the old ways, imitating the Europeans in their midst, and re-thinking their own cultures. Out of the discussions and experiences of these modernizers, nationalism grew.

Nationalist and Independence Movements

Nationalism is a movement by a group of people living in a territory, or having a feeling of belonging to a territory, who share cultural, religious or ethnic characteristics. They work toward forming a national state that is recognized by the community of other nations. Colonized and non-colonized peoples worked to realize independent nationhood during the nineteenth century, some winning their struggles and some being denied the opportunity. Many of these struggles spilled over into the twentieth century, or are still going on today. Nationalist and independence movements were usually joined together, even where traditional groups such as tribes, ethnic majorities or minorities were divided into separate colonies, or where groups wanted to form separate nations out of lands joined into one European colony. Political organizations, protests, and civil actions against the colonial governments resulted in violent or peaceful resistance to foreign rule, as did the great leader Mahatma Gandhi. Leaders—often western-educated, middle or upper class people—wrote, spoke, and organized to gain the support of other classes in society, and were often jailed, sometimes exiled, and sometimes killed. Successful nationalist leaders sometimes became the heads of new national governments.

New Ways of Life

The nineteenth century was a time of intense competition among industrializing countries of Europe and the United States, often called "the West." It was a time of upheaval for people in both industrializing and colonized countries, as societies adjusted to massive changes in the economy, in politics, and in the way households took care of their basic needs. There were new products, new ways of dressing, eating and working. It was a time of great social mobility for some. Rags to riches stories were common as people found new business opportunities, some taking up new lives in faraway lands. Others were plunged into poverty unknown by their grandparents, or seized as slaves. Millions died from diseases, famine, and war. People questioned their own past and present, their religions, and their ideas about science, both believing in progress and doubting it. Artistic

expression flourished in music, literature, painting and crafts, and a treasure-house of human creativity was opened by travelers seeking to understand human history, to learn languages, and to collect arts, stories, and crafts of all the world's cultures. Styles and decorations rapidly crossed from one culture to another. Museums sprang up, and photography was invented. Color printing and mass media emerged and became more accessible. It was both a time of great destruction and great production, of great injustice and great efforts to achieve justice.

Twentieth Century to the Present: Globalization of Trade, Communication, and Culture

If it was possible to make a short list of changes that took place during previous centuries, it is more difficult to do that for the twentieth century and our own time. Many changes continued from the previous century. Nationalist struggles resulted in many independent nations. Two world wars and the Cold War had lasting effects throughout the century. Economic development and social growth were important goals for newly independent nations, and industrialization spread unevenly. Trade and economic interdependence came to be called globalization, and the environment became a major issue. Air travel, vaccines and tourism allowed people to travel to wondrous places in the Indian Ocean for work and pleasure, and for people native to the Indian Ocean region to travel, work, and migrate around the Indian Ocean and all over the world. In this era, too, the land routes are not shown on the map. The networks of roads became very thick during this era.

World Wars I and II

Competition among European powers took the form of economic contests over raw materials, lands, and trade, especially because industrialization required resources not found in Europe. Warfare among nation-states and land empires spilled over into the oceans, especially when competition for colonies was at stake. This competition led to the build-up of military hardware such as ships, the race to invent more powerful weapons and more secure defenses. Highly destructive explosives, guns and artillery were the instruments that allowed European powers to overcome people and territories where they were not available. World War I ended old empires like the Ottoman, but also contributed to ending modern empires. Millions of indigenous troops from the colonies fought in World War I, and demanded independence.

Air power was a small factor in World War I, but by World War II, bombers dominated the air, and aircraft carriers played important roles. Coal power gave way to the use of petroleum, and the age of nuclear power began with horrible destruction by the atom bomb. Colonial powers searched for oil and sought alliances which would grant their nations permanent access and profit from petroleum. World War II followed the worldwide Great Depression that proved how well connected economies already were. The Indian Ocean was more directly affected by World War II than World War I, because Japan, a rising industrial power, occupied territory from the Russian Pacific coast and Korea to Indonesia and Burma in Southeast Asia. The occupation ended with hard fighting and Japanese surrender. The atomic bombs dropped on Japan in 1945 were acts of destruction that led to an arms race on one hand, and movements to eliminate weapons of mass destruction.

Independence and the United Nations

From the beginning of the 20th century, and especially after the two world wars, colonized countries demanded their independence. Colonial powers were weakened by war, and some were willing to grant independence shortly after 1945. Other independence struggles were violent and long, lasting into the 1960s and 70s. Nation-building after the anti-colonial struggles was often difficult because post-colonial boundaries split tribes, religious, and culture groups, tore cities from surrounding lands, or left nations with few resources. Some independence agreements left groups in power that had difficulty balancing their people's needs with the demands of major powers. From large nations like India to tiny nations like Mauritius, all joined the United Nations and became active in its development and cultural organizations and its political assemblies. During the Cold War, newly independent countries, led by Indian Ocean nations, opposed the idea of choosing between Communist governments led by China and the Soviet Union, and free market political systems led by the United States. They formed the Non-Aligned Movement, which first met in 1955 in Bandung, Indonesia.

Development and Underdevelopment

The most difficult but hopeful task facing any newly independent nation in the mid-20th century was development, sometimes called modernization. There were theories and prescriptions about how nations could "catch up" to industrialized nations, if only they completed a list of tasks, including better health care, education, and efforts to increase production and cut imports. After decades, however, many countries did not see much progress. It proved very difficult to overcome the economic advantages held by former colonial powers, which had more capital, more production, better access to cheap resources, and controlled access to their own markets. The global economy continued to look much like it did under colonialism. Some nations in Asia and Africa remained unable to develop, and their populations lived in poverty that sometimes seemed hopeless, especially with the double effects of disease and environmental destruction. Japan recovered a strong economic position after the war. Toward the end of the century, some Asian countries, such as India, China, Malaysia and Korea had achieved growth and developed industries to manufacture and export goods, develop banking and finance, and attract foreign business capital. Oil-producing nations of the Arabian Peninsula and the Gulf poured out oil to satisfy the world's thirst for energy, and invested the wealth from oil in developing their nations. The Arabian Peninsula was proven to have nearly half of all known oil reserves, but other countries near the Indian Ocean also have oil. Approximately 40 percent of the world's offshore oil production comes from the Indian Ocean.

Countries in the Indian Ocean are also the source for Liquified Natural Gas, the cleanest-burning fossil fuel. Today, the search is on for environmentally low-impact, less expensive fuels such as wind power, geo-thermal, and solar. Even ocean waves can be harnessed to generate power. Global efforts to help the poorest nations bridge the technology gap, cure diseases, and repair the effects of centuries of greedy resource exploitation may offer hope.

Globalization

Globalization is the process of integrating the world's economies into an interdependent, connected whole. Globalization can also mean that cultures are in communication across the globe, visiting as tourists or workers, sharing ideas and influences such as world religions, world history studies, world music, world news, and popular culture fads. Globalization is the result of centuries of expanding trade and communication, but it depends on today's instant communication via telephone, television,

radio and the Internet. Unlike even a century ago, many more people have access to global communication technology. The technology gap still prevents many poor people from access, however.

Globalization is uneven, and it is not only positive. It can in some ways erase inequality, or it can make inequality worse. For example, when many countries produce cell phones, they become less expensive for everyone due to competition. The other side of that coin, however, is competition for jobs in a global economy. Wherever workers are cheapest, production can flow. Economists have called this "the race to the bottom," since workers are forced to accept low pay or watch jobs go elsewhere. On the other hand, when the tsunami of 2004 struck, people all over the world immediately began sending donations to help. Non-governmental organizations (NGOs) have taken up many causes, such as the International Federation of the Red Cross and Red Crescent Societies, and Doctors Without Borders. Money flows have been globalized, even though there is not one world currency. Globalization means that when the economy in a few wealthy countries suffers, financial problems are felt around the world. Globalization has increased during the 20th century and continues into the 21st century.

Environmental Challenges

During the past two or three centuries, people traveled through the earth discovering and making use of resources. The world seemed like it could never be exhausted. As long as humans have existed, they have had an impact on the environment, hunting large animals, cutting and burning forests, and introducing plants and animals to new lands. All of these activities brought environmental change, but world population was much smaller then. It took 10,000 years of human history until around 1830 before the world population reached one billion. It took only two hundred more years to reach six billion people. Migration, urbanization, agriculture, use of resources including fossil fuels (coal, petroleum, and gas), forest products, sea creatures and domestic animals, mining of minerals and building roads have huge effects now. Science has also advanced our knowledge of the environment, so we can study our own impacts.

Global warming is changing the atmosphere and weather. Melting polar ice-caps will cause sea levels to rise as they did, much more slowly, in prehistoric times. Islands home to millions, including the Maldives and many Pacific Islands will be no more unless something can be done. The Tsunami of 2004 and Cyclone Nargis in 2008 gave an idea of the disaster rising water can cause. Some island nations have brought the issue to the United Nations, asking that wealthy nations which contributed to global warming through fossil fuel use help pay for measures to save these islands from being submerged.

In the Indian Ocean, species extinction from habitat loss is a major issue being researched by biologists. Deforestation of tropical rain forests is proceeding rapidly due to human population increases and economic pressure to extract resources. Other environmental problems in the oceans include over-fishing, causing populations to crash. International organizations are trying to agree on sustainable fishing practices. Pollution from pesticides, toxic oil and chemical spills and land run-off is causing death and disease in marine life. Noise pollution from ships affects whales and other marine mammals. Plastic bottles and other garbage in the seas have formed vast floating islands of trash. Other problems of uncertain origin are coral reef bleaching, algae blooms, and mass beaching

of whales. International agreements like the Law of the Sea help large and small nations cooperate and control destructive competition.

Conclusion

For all of the time humans have lived in the Indian Ocean, with dramatic changes over time, some things have changed little. People still gather shells and fish in the ocean as they did at the dawn of time. Sailboats and coasting voyages for trade and transportation still take place among coastal people. Markets are still places where people come to exchange, whether they are online or on the beach. Farmers and artisans still produce things for sale, as they have for millennia. Huge ships and global systems of communication are new, but the people employing them still have to agree on prices and quality. Workers migrate to find opportunity, and people of the Indian Ocean are reaching into and beyond their sea to use their talents. Even the ancient handicrafts of the ocean peoples are finding a place in globalized markets. Finally, trade still continues because of the complex geometry of meeting people's needs and wants with products distributed unevenly around the world.

Further Reading

Bushman, Rainer F. *Oceans in World History*. Boston: McGraw-Hill, 2007.
Kearney, Milo. *The Indian Ocean in World History.* New York: Routledge, 2004.
Pearson, Michael N. *The Indian Ocean*. London: Routledge/Taylor & Francis Inc., 2003.
Riebeek, Holli. "Paleoclimatology: Introduction." Text. Article, June 28, 2005. From http://earthobservatory.nasa.gov/Study/Paleoclimatology/paleoclimatology_intro.html.
Wilkinson. "Scholar Voices" From http://www.accd.edu/sac/history/keller/IndianO/Wilkin.html.
"World History for Us All." From http://worldhistoryforusall.sdsu.edu/default.htm.