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Comparing Ship Technology: The Ships Columbus Used Versus the Ships of Today

Christopher Columbus 's first voyage to the Americas in 1492 took place on three major ships: the Nina , the Pinta, and the Santa Maria--the former two being small, quick, easily maneuvered ships called caravels and the latter being Columbus's larger lead flagship, called a carrack or nao. As one can assume, these three ships were far less advanced than the ships of today and possessed fewer navigational technologies, making the job of navigator on said ships, Christopher Columbus's, an extremely demanding role. However, it helped the late 15th-century explorer that the Nina, Pinta, and Santa Maria were some of the most highly advanced vessels of their time, created specifically for the various tasks of the expedition. Similarly, seafaring vessels designed for exploration today are equipped with the latest technology and are deliberately tailored for completing defined tasks.

Columbus' ships were constructed with specific roles for the journey; the caravels (smaller ships) were built for exploration--they could navigate better, were faster, and were more efficient than the Santa Maria, which was created mostly for cargo and space for additional materials to be brought to and from the land they explored. This specialization of ships could easily be compared to the remotely operated vehicles (ROVs) of today. For example, in 1967 the National Oceanic and Atmospheric Administration (NOAA) constructed the Exploration Vessel Nautilus which contains two ROVs onboard, the Hercules and the Argus. Like the Nina and the Pinta, these smaller structures are designed to be quicker and more easily navigable than their larger counterparts. However unlike the Nina and the Pinta, these ROVs do not have a crew onboard and they are far smaller than Columbus's caravels

were, with the ROVs being 11 feet and 23 feet and the Nina and Pinta each being approximately 75 feet. In Columbus's situation, having access to the technology of remotely operated vehicles likely would have enabled him to more thoroughly explore the area he was discovering and more efficiently navigate the Atlantic.

During his journey, Columbus used a technique called Dead Reckoning to navigate to the Americas. The process of dead reckoning uses tools such as a compass to find the ship's speed and direction, and then mark these quantities on a map to discover where the ship is going. This process, while effective for many explorers and sailors of the time, is now archaic and outdated. If Columbus had had access to the ships of today, he would have discovered that global positioning systems are common and effective tools for safely navigating. Modern-day GPS and navigational technologies would have allowed Columbus to know not only his direction and speed but also his location and destination. With access to GPS, Christopher Columbus likely would have been able to more accurately and safely locate his direction, and arrive at his desired destination far more quickly.

The primary purpose of the 1492 voyage of Christopher Columbus, his 90-person crew, and his three ships was not to discover the Americas, but to explore a new route to known lands. Today, because technology is able to help us identify the most efficient routes and major land masses have been thoroughly studied, the mission of exploratory ships and vessels are now more often for underwater exploration and research. According to the National Oceanic and Atmospheric Administration (NOAA), the vast majority of the world's oceans have not been discovered or mapped out, just like how in the late 15th century, much of the land on Earth had not been mapped out. Instead of caravels and carracks, present-day exploratory voyages take place on human-operated submarines like the Alvin, capable of exploring areas nearly three miles below the ocean's surface. Like the Nina, Pinta, and Santa Maria, this vessel also requires a large crew to maintain, guide, and control it and is used primarily for exploration as opposed to recreation or biological research.

The size of ships has also drastically changed since Columbus went on his expedition to the Caribbean. The Santa Maria was a carrack, or nao, and measured roughly 117 feet long, while the Pinta and Nina were caravels and about 75 feet long. 910 When one compares these ships to the exploration ship Nautilus, which is 211 feet long, it is clear that the Santa Maria, Pinta, and Nina were much smaller and more compact. As they were smaller, Columbus's

ships could, therefore, hold much less cargo than the average exploration vessel of the modern day (it is worth acknowledging, however, that they also likely required fewer materials than the larger ships of today). Hence, not only has the quantity of fuel and technology required by ships increased immensely with the progress of society, but the physical size of these vessels has as well.

While there are countless ways in which the ships of modem day can be argued to be superior to Columbus's ships, the Nina, Pinta, and Santa Maria were still among the most advanced ships of the 15th century. According to the American Society of Mechanical Engineers, they were "designed and engineered to be sturdier than any other ships of the day" and used a sailing structural technique called lateen rigging, in which a specific type of sail was connected to a pole which made the ship's direction more constant and easier to guide. This made the vessels highly sophisticated for their time and therefore more beneficial to providing Columbus with a successful journey. Today's ships often require a vast amount of fuel, oil, and other materials to travel. According to research from the University of Colorado Boulder, a large cruise ship uses more than 80,000 gallons of gasoline per day on average, an enormous quantity. While Columbus's ships were much smaller and therefore did not require quite so much fuel, this shows the incredible amount of resources required to use a modem ship, as opposed to the Nina, Pinta, or Santa Maria, which require only wind power. As Columbus's ships relied solely on renewable, free resources, his ships were more environmentally friendly, cost-efficient, and more widely functional in terms of fuel use, making them extremely practical for his long, arduous expeditions.

Like almost every other field of scientific or social discovery, ship technology and sailing strategies have all changed much since Columbus's time. The specialization of vessels, methods of navigation, areas of exploration, ways of movement, and size have all evolved dramatically in the past half millennium and very likely will continue to evolve throughout the coming half. It is clear that even though the Nina, Pinta, and Santa Maria were some of the greatest vessels of their time, the technology of the ships of today far outperform the ships of the 15th century. The purpose of the construction and implementation of these vessels, however, remains largely the same: to perform tasks that are highly specialized for the types of exploratory expeditions they are commissioned for.

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