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Commentary

Studies of the Ocean Floors Topography

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DESCRIPTION

Of all the planets in the solar system, Earth is singled out as the "Blue Planet." This colorful label is indicative of the presence of water on the planet's surface. When viewed from space, Earth's oceans, which cover nearly three-fourths of the total sphere, appear blue. The sheer preponderance of water makes it easy to comprehend how the oceans influence nearly every life process on Earth. This volume takes a comprehensive look at the world's oceans, examining them from the tip of their wave crests to the depths of their basins. Topics covered include currents, sea life, the ocean's effect on climate, and the science of oceanography.

Although they are, in truth, one continuous body of water, the world's oceans are commonly referred to in the plural. Earth has three major oceans: the Pacific, the Atlantic, and the Indian Ocean. The Pacific is the largest in area and volume, and the Indian is the smallest. The Arctic Ocean is technically considered part of the northern Atlantic. While the waters surrounding Antarctica are sometimes called the Southern Ocean, they are considered by many to be part of the southern Pacific, Atlantic, and Indian oceans.

The origin of oceanic waters remains something of an unknown, though a few theories offer an explanation. One states that as the planet was forming, its developing crust reacted with water vapor and other gases in the atmosphere to produce liquid water. Of the two kinds of crust that solidified over Earth's mantle, the thicker oceanic crust formed a basin for the oceans and served as a cradle for Earth's early living organisms. The earliest fossils of algae and bacteria date from 3.3 billion years ago.

Topographical studies of the ocean floor have revealed that Earth's ocean basins possess several terrain features that might be familiar to land dwellers. Similar to its terrestrial counterpart, the ocean bottom is roofed with hills, mountains, featureless plains, and deep gorges. The majority of the ocean floor, however, lies at depths of between 4,000 meters (13,000 feet) and 5,000 meters (16,5oo feet). The Mariana Trench, located in the western part of the North Pacific Ocean, plunges to over 11,000 meters (36,200 feet). Little was known about ocean basins until the event of sonar within the early 1900s. Sound waves emitted by sonar allow marine researchers to detect objects thousands of feet under water. Other tools are also used. Satellites, global positioning systems, radar, and echo-sounder systems are among the foremost important remote-sensing tools. These tools are wont to map areas several parts of the ocean, the Mid-Atlantic Ridge being one among the foremost prominent mapped features. Core samples of sediment from deep areas of the ocean bottom are a boon to the idea that revolves around tectonics. The top layer of crust is formed from tectonic plates in constant, albeit slow, movement. Beginning 200 million years ago, the supercontinent Pangea-a land-mass made from all of Earth's continents began to interrupt apart, eventually fragmenting into the present-day continents separated by the oceans. Even today, spreading plates at rock bottom of Earth's oceans spew molten rock from the mantle, creating new floor. The theory of tectonics explains the relative "newness" of the ocean bottom compared to the age of the planet; the ground is consistently recycling itself.

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