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Geography and the Shaping of Early Colonial Cuba

En Cuba pueden aclimatarse y prosperar hombres, plantas y animales de todas partes del mundo.

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Many human phenomena and characteristics such as behaviors, beliefs, economies, genes, incomes, life expectancies, and other things are influenced both by geographic factors and by non-geographic factors.

JARED DIAMOND

This opening chapter examines the many ways geography and history have intertwined in Cuba. Its primary objectives are first, to provide a dynamic portrait of the island's geological evolution and its most significant geographic traits, including its insularity, shape, location, topography, and climate; and second, to trace the ways Cuba's inhabitants interacted with their environment from the pre-Columbian era until the end of the seventeenth century.

While geographic characteristics are not the deterministic forces many once held them to be, they have some impact on both historical developments and culture. Even today, human beings do not have the capacity to change most aspects of their geographic environment. Over the centuries, Cuba's inhabitants have not been able to change the shape and location of the island, its rainfall calendar, the periodic passage of destructive hurricanes, or the routes of its oceanic and wind currents. Human agency, however, allowed the island's inhabitants to take advantage of favorable geographic circumstances and triumph over some of the natural challenges of their habitats.

Although Spanish settlers could not alter the flow of sea and wind currents, they could locate Havana, the island's eventual capital, in the most propitious location, at the crossroads of important ocean currents. Two earlier capitals, Baracoa and Santiago, both located in the east, were not as auspiciously situated and thus soon lost importance and population to Havana, which became the de facto capital in the 1550s. While Havana was favored with the passing of ocean and wind currents and a magnificent pouch-type bay, it lacked an adequate supply of fresh water. Its first Spanish settlers used rainwater they collected in cisterns or traveled long distances to fetch water. With the completion of the ambitious Real Zanja aqueduct in 1592, the city received ample amounts of water yearlong from La Chorrera (the Almendares River). To give another example: as soon as French corsairs recognized Havana's strategic importance, it became the object of unrelenting attacks and blockades. Although the city lacked natural protection because of its flat terrain, military and civil authorities made good use of the abundance of local limestone and imported slave labor to erect fortifications that reduced its vulnerability to attacks.

Geological Evolution

In geological terms, the shape, size, and location of Cuba that we are familiar with are relatively recent developments that occurred between the early Maastrichtian Age and the late Eocene Epoch (72.1 to 33.9 Ma [million years ago]), roughly about seventeen minutes ago if we compress the estimated 4.5 billion years of earth's existence into a 24-hour period.[1]

Over billions of years of continental drift, the earth's surface continuously expanded and contracted, moved in different directions, and rearranged itself. This is sustained by the plate tectonics theory, first developed in the early decades of the twentieth century by meteorologist Alfred Wegener, who was seeking to explain the long-term movement of the earth's crust. The theory maintains that the crust is composed of numerous plates that move slowly in different directions, sometimes toward each other, sometimes away from each other. Later scientific discoveries solidified the theory, which has become widely accepted.

At times, various land masses were separated from each other and at times they came together to form supercontinents. The most recent formation of a supercontinent was Pangaea, which came together between 300 and 270 Ma. If we picture the Caribbean/Gulf of Mexico as a closed mouth inside Pangaea, trapped between North and South America and facing west, that mouth began opening around 280 Ma, disconnecting North and South America at the isthmus. During this prolonged rearrangement of tectonic plates, a mass of land that would evolve into Cuba shifted south and west of North America, ending up in the Pacific, where it was reconfigured along a north-south axis. Around

100 Ma, that mass began to move east, until it reached the location of the current American isthmus. It continued to move north and west, until it reached roughly its current position circa 50 Ma, by which time it had reverted to an east-west orientation.[2]

Cuba's geological development was the result of numerous forces operating over millions of years. The primary overarching force was the extended collision between the arc of islands of the proto-Caribbean and the North American plate during the late Cretaceous and Paleogene periods. Other forces shaped specific parts of present-day Cuba. Early on, between the Low Jurassic and Low Cretaceous periods (200–100 Ma), that arc of islands interacted with the Yucatan Peninsula, producing Cuba's westernmost terrain, known as the West Cuban nappe stack. Yet another force, the collision between that arc of islands and the Bahamas Plate, which occurred between the Upper and Lower Jurassic periods (200–145.5 Ma) formed vast portions of central Cuba, primarily through the accumulation of karstic sediment. Because of this clash, Cuba was pushed toward and became part of the North American Plate, its southern coast becoming the tectonic border between that plate and the Caribbean Plate. Thus, while the part of Cuba that is above water is situated in the Caribbean, geologically it is not part of that plate.[3]

More recently, during the Paleogene period (66–23 Ma), the arc of Caribbean islands clashed with the North American Plate, elevating land mass through volcanic and other forces that surfaced above sea level. The coast of southeastern Cuba between Cabo Cruz and Punta de Maisí marks a major stretch of collision between those two plates. As the North American Plate pushed south, the part of the Caribbean Plate known as the Gonâve Microplate was subducted, forming a deep ocean trench known as the Cayman (or Bartlett) Trough. Meanwhile, along the southern border of the North American Plate, steep volcanic mountains rose that became the Sierra Maestra mountain range. Cuba's southeast, one of the most geologically unstable parts of the Caribbean, has a long history of volcanic and seismic activity. Soils of the Nipe type derived from igneous rock testify to the region's volcanic origins.[4]

An extraterrestrial factor further complicated Cuba's geological development. Around 65 Ma, a massive asteroid struck the Yucatan Peninsula. This asteroid is widely believed to have generated the nuclear winter that led to the extinction of dinosaurs and most of the earth's other animal and plant species. The western end of Cuba has some of the largest iridium deposits anywhere in the world. That mineral is extraordinarily rare on earth but is abundant in asteroids.[5]

At times, Cuba was neither an island nor an archipelago. During the Miocene epoch (23–5.3 Ma), most of Cuba was above sea level and thus was connected by surface land to the Bahamas and to what today is the southeastern United States. As recently as 8,000 to 15,000 years ago, when ocean levels were low, the current Cuban archipelago was a single island, connected above water with the Isle of Youth and its surrounding keys. At other times, Cuba was partially below sea level, with only its mountain ranges and volcanic peaks rising above water. During other extended periods—the late Cretaceous period (100–66 Ma), for example—it was completely submerged.

During much of the last glacial period, often referred to as the last ice age (110,000–12,000 years ago), when sea levels were 300–500 feet below their current level, an above-surface land bridge may have connected Cuba and the Yucatan Peninsula. Some scientists theorize that that bridge was destroyed by a southbound megaflood produced by a rapidly melting ice cap that covered most of North America. Its torrent washed away most of Cuba's soluble karstic surface. Earthquakes may also have played a role in the destruction of the land bridge.

In 2000–2001, marine engineer Pauline Zalitski and her husband, Paul Weinsweig, discovered massive rock formations a few miles west of Cuba's westernmost tip, where the theorized land bridge would have been over 10,000 years ago. The structures are geometric; they include large quadrilateral blocks and circular formations. Some are even pyramid-shaped. This led to some speculation that these formations could be the ruins of a sunken Mesoamerican city—an Atlantis of sorts. However, Cuban geologist Manuel Iturralde and the scientific community are not ready to hypothesize, let alone conclude, that this network of rock formations are the ruins of an ancient city built by humans.[6]

Cuba's geology continues to change. As imperceptible as it may be, the island is still in movement, shifting west at the rate of 0.79 inches (2 centimeters) each year. Due to global warming, sea levels around the world have risen at an accelerated rate in the past three decades. Because it has such extensive coastal areas, Cuba is particularly vulnerable to the damaging effects of rising sea levels. A study conducted by Cuban scientists found that sea levels around the island were rising at a rate of around 0.079 inches (2 millimeters) each year.[7]

The Insular Condition

Insularity is Cuba's most salient and historically significant geographic characteristic. Cuba is the largest and most western of an arch of submerged Caribbean