

ALEXANDER von HUMBOLDT: THE FIRST ENVIRONMENTALIST

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[Ed. Note: This is the first installment of a four-part article on the life of Alexander von Humboldt. Dr. Caswell is a retired chemistry professor who has an award winning exhibit on von Humboldt. He is a Director in the Society for Hungarian Philately and also a founding director of the Seattle Philatelic Exhibition.]

Introduction

At two o'clock in the afternoon on 5 June 1799, the corvette *Pizarro* dodged the English blockade and sailed from Coruña, a port in northwest Spain. Although the *Pizarro* was a warship, it carried two civilian passengers, two eager young men who had abandoned their careers to fulfill a dream of becoming explorer scientists.

Prussian Baron Alexander von Humboldt (Fig. 1) had left his career as a mining engineer. His companion, French botanist Aimé Bonpland (Fig. 2), was a former military surgeon. Humboldt and Bonpland had met at the home of French botanist Jean-Nicolas Corvisart in Paris. They decided to embark together as naturalists on a journey of exploration.

Alexander von Humboldt, born in 1769, had been interested in science from his boyhood. His interest in faraway places had been influenced by his favorite boyhood book, *Robinson Crusoe*.

As a boy living at Schloss Tegel (Fig. 3), the family estate near Berlin, he wandered about the estate, collecting leaves, insects, and rocks that fascinated him. He took them home to identify them and form collections. His father encouraged these interests.

Alexander's desire to become a scientific explorer was inspired by his acquaintance with Johann Georg Forster (Fig. 4), whom he met at the University of Göttingen.



Fig. 4. Forster
DDR, 1979, Sc#1998

Forster had sailed with Captain James Cook on Cook's second voyage of scientific exploration, and had written a best-selling book about the voyage. In the spring of 1790, Humboldt and Forster traveled down the Rhine River together, collecting botanical and mineralogical specimens and observing agriculture and industries along the river. As a result of this journey, Humboldt published his first scientific paper, which dealt with the basalt deposits along the river. Forster's influence was the deciding factor in leading Humboldt to decide to be a scientific explorer.

Aspects of Humboldt's education prepared him to be the first environmentalist. At the age of seventeen, he studied drawing at the Berlin Academy of Art. This training enabled him to prepare accurate illustrations of his observations, and of the specimens he collected. He pursued his interest in science in 1789–90 at the University of Göttingen, where he studied physics and mathematics. Humboldt studied geology and mining engineering at the *Bergakademie Freiberg* (Freiberg Mining Academy) (Fig. 5) in Saxony in 1791–92. He graduated in 1792 with certification as a mining engineer.



Fig. 1. von Humboldt
Berlin, 1959, Sc#9N155



Fig. 2. Bonpland
Argentina, 2008, Sc#2483



Fig. 3. Schloss Tegel Cachet Cover

Although he had completed his education, Humboldt could not yet begin journeys of exploration. He was subject to his mother's will, that demanded that her sons be employed in the Prussian Civil Service. Accordingly, he accepted a Civil Service appointment as Inspector of Mines, and made tours of mine inspection throughout the Kingdom of Prussia.

Humboldt's mother died in 1796, leaving him a wealthy man. He promptly resigned his Civil Service job and began a time of wandering.

Wanderlust

In March 1798, after a year of wandering through central Europe, Humboldt arrived in Paris. He met various scientists and tried to persuade one or another of them to accompany him on a voyage to North Africa. This idea was frustrated by the French Revolutionary War. He made a proposal to French navigator and explorer Louis Antoine de Bougainville for a voyage to the South Pole, but Bougainville was not interested. He finally found a worthy companion for such a journey when he met Bonpland.

Aimé Bonpland was born in 1773 in La Rochelle. He studied medicine, but he preferred to concentrate on botany. Like Humboldt, he yearned to be a naturalist-explorer.

In Paris, Humboldt purchased equipment for making scientific measurements during his travels. These included barometers, thermometers, table sundials, and surveying equipment. He and Bonpland spent two months in Marseilles attempting to find passage to Egypt, but were unsuccessful because of the ongoing war.

At the end of December 1798, they departed for Spain, with the hope of making explorations in Spanish America. In March 1799, Humboldt applied in person to King Carlos IV of Spain for permission to embark on a journey of exploration in Spanish America. He proposed to study the biological and mineral resources of the Spanish territories and prepare a report on them for the King.

The King granted his permission, but required Humboldt to pay the expenses of his explorations. Humboldt agreed to these terms, which were softened by the grant of a passport that required officials in all places he visited to give him their support and provide for his needs. This passport enabled Humboldt and Bonpland to travel on Spanish warships. Thus began the five-year exploration of



Fig. 5. Freiberg Mining Academy Bicentennial First Day Cover
DDR, 1965, Sc#796-99

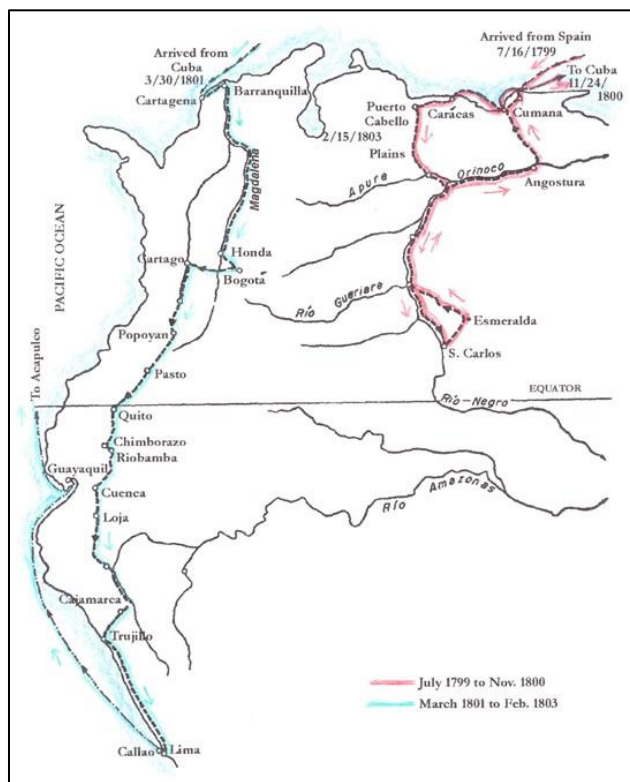


Fig. 6. Map of Humboldt's Travels in South America

the Americas, which led to Humboldt's reputation as a great environmental scientist. The map (Fig. 6) shows the routes of Humboldt's travels in South America.

The Canary Islands

On 17 June 1799, the *Pizarro* arrived at the Canary Islands, where the travelers spent several days, immersed in the study of the unique flora of the islands. Humboldt later produced the first published study of these plants (Fig. 7).

As a geologist, Humboldt was interested in volcanoes. The travelers went to Tenerife, site of the highest volcano in the Canary Islands. Upon arrival, Humboldt and Bonpland presented their passport to the governor of the island, who provided them with lodging during their stay.

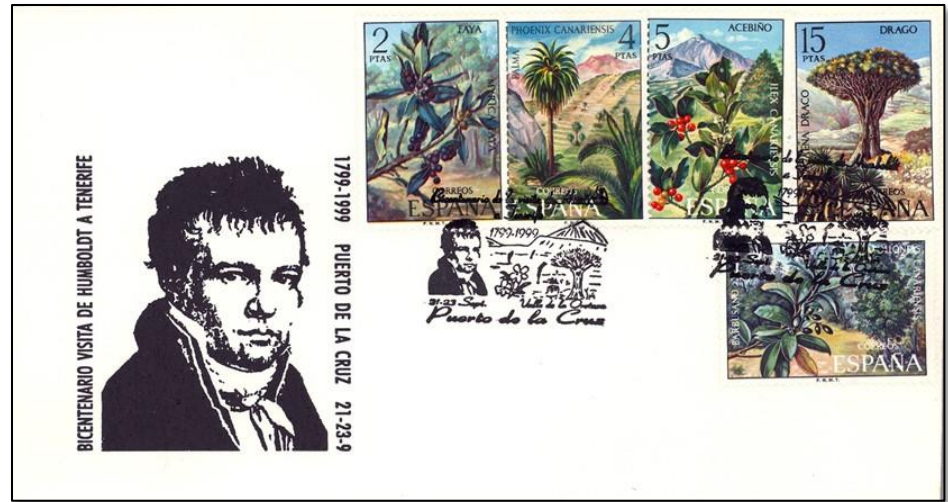


Fig. 7. Cachet & Cancel for Bicentennial of von Humboldt's Visit, 1999 Spain, 1973, Sc#1747-51

Humboldt and Bonpland ascended Pico del Teide (Fig. 8), the highest mountain in the Canary Islands, and the fourth largest volcano on earth, considering its height above the ocean floor. Humboldt was impressed by the changes in plant species as the altitude changed, warm-climate plants at the base of the mountain, and tundra plants near the summit. In addition to collecting herbarium specimens during the climb, Humboldt also measured temperature and pressure changes with altitude, and collected rock samples.



Fig. 8. Pico del Teide Spain, 1966, Sc#1358

Venezuela

The travelers re-embarked on the *Pizarro* on 25 June 1799, and sailed for South America. On the morning of 16 July 1799, Humboldt and Bonpland entered Cumaná, in the Captaincy-General of Caracas (now Venezuela). The captain of the *Pizarro* introduced them to the governor of the province of New Andalusia, who provided them hospitality.

Humboldt and Bonpland employed a native, "Don Carlos del Pino," who accompanied them throughout their travels in South America. They explored the region around Cumaná, visiting the local missions, an old gold mine, and studying the Guaymas Indians. One night they observed a strong lunar halo.

During their stay in the vicinity of Cumaná the travelers visited the Guácharo Cavern (Fig. 9), and learned about the Guácharo birds (*Steatornis caripensis*) (Fig. 10). These strange birds roost in the cavern during the day, and fly at night to feed, making an extremely raucous noise. The Guácharo birds are also called "oilbirds," because the Indians harvest them and render their flesh for cooking oil.



Fig. 10. Guácharo Venezuela, 1982, Sc#1270



Fig. 9. Guácharo Cave Venezuela, 1982, Sc#1257

In addition to his interests in botany and geology, Humboldt was also interested in the agricultural productions of the lands that he visited, and their contributions to the local economy. Humboldt and Bonpland inspected a plantation of 254,000 cacao trees (*Theobroma cacao*), the source of chocolate (Fig. 11).

While they were in the area, the travelers observed a solar eclipse on 28 September 1799. On 4 November, they experienced their first earthquake. The superstitious local people said that the lunar halo of the previous month was an omen that predicted the earthquake.

On 18 November, the travelers sailed from Cumaná to La Guaira, the seaport of Caracas. From La Guaira they went overland to Caracas.

During December, Humboldt and Bonpland explored the environs of Caracas, collecting plant specimens in the Higuerote Mountains and in the Aragua Valleys. Their guide during these activities was a student at Caracas University named Andrés Bello.

On New Year's Day 1800, Humboldt and Bonpland began the ascent of *La Silla* ("The Saddle"), a mountain just outside Caracas. They attained the peak, at 9,022 feet, on the following day. Along the way, they collected plant specimens, and noticed the variation of species with altitude, as they had at the Pico de Teide. Young Bello accompanied them part way, but discovered that his stamina did not match theirs, and gave up part way up the mountain. Their desire to climb a mountain puzzled the Caraqueños, who had never before heard of such a thing, but who watched the ascent with telescopes.

Humboldt and Bonpland departed from Caracas on 7 February 1800. They traveled south, collecting specimens and enjoying the hospitality of estancias along the way. On the road from Turmero to Maracay, they inspected the Samán de Güere tree (*Albizia saman*) (Fig. 12), which had a circumference of twenty-eight feet. This tree still stands today and is a national treasure in Venezuela.

Near Puerto Cabello, the travelers came on 1 March to the shore of Lake Valencia, where they stayed three days at the Hacienda de Bárbula. The local people told Humboldt that the lake level had sunk since the area was first settled. They believed that there was a "slow leak" in the bottom of the lake, but they did not know what the lake was "leaking" into. They also told him that the area had formerly been thickly forested, but the forests had been cleared to create farmland.

Humboldt pointed out that trees draw up moisture through their roots and transpire it into the air through their leaves, making forests humid, but plowed land does not do this. The loss of the forests had made the local climate drier. Lake Valencia was not slowly leaking. It was evaporating, he said. Humboldt also pointed out that forests anchor the soil. Clear cutting a hillside made it vulnerable to sliding when it became saturated with water from a heavy rain.

From Lake Valencia, the travelers set out on the Venezuelan *Llanos* (plains). They continued south and arrived on 27 March at Villa de San Fernando Apure, a Capuchin mission, on the bank of the Apure River. On the Apure River, Humboldt made his first observation of electric eels (*Electrophorus electricus*) (Fig. 13). He was the first person to dissect one and describe its physiology. Later, on the Orinoco, he was stung by an electric eel. It took him two days to recover.

[to be continued in the next edition]



Fig. 11. Cacao Pods
Venezuela, 1937, Sc#313



Fig. 12. *Albizia saman*
Venezuela, 1969, Sc#C1011



Fig. 13. *Electrophorus electricus*
Guyana, 1980, Sc#317c

FACT

Having blue eyes is actually a mutation. Before the mutation occurred, all human beings had brown eyes.