which goods were most commonly traded. He even mentioned a direct trade communication with Cairo.

In 1874 and 1875, Abi-Serour made two expeditions into little-known parts of southern Morocco to collect intelligence and harvest rare plants for Beaumier and the French botanist Ernest Cosson. These journeys were recorded by Henri Duveyrier in the Bulletin of the Geographical Society of Paris. At age fifty-two, Abi-Serour accompanied Charles de Foucauld on his extremely dangerous eleven-month exploration of Morocco (1883-1884), during which the Frenchman, speaking little Arabic, disguised himself as a Russian rabbi. On occasion, Abi-Serour told the Jews in the mellah where he and Foucauld were lodged that Foucauld was a medical doctor who was a specialist in eye diseases. In the town of Taza, Abi-Serour swore that the astronomical instruments being assembled were a preventative against cholera. Rabbi Mordecai unquestionably helped Foucauld survive this Moroccan journey, but Foucauld nonetheless later characterized him as being an unhelpful, if not worthless, companion. Abi-Serour’s last years were spent in Algiers, where he dallied in alchemy and died on April 6, 1886.

[See also Foucauld, Charles de, and Timbuctoo.]

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Abruzzi, Luigi (1873–1933), Spanish-born Italian mountaineer, Arctic explorer, and naval commander. Luigi Amedeo di Savoia-Aosta, Duke of the Abruzzi—commonly known as Abruzzi—was born on January 29, 1873, in Madrid, where his father was briefly the ruling king of Spain. Abruzzi also was a grandson of King Vittorio Emanuele II of Italy. Leading a highly skilled party of mountaineers, Abruzzi became the first person to ascend Mount Saint Elias (16,767 feet [5,111 meters]) in Alaska in 1897. In 1906, with one of the most efficient expeditions ever assembled, Abruzzi climbed Margherita Peak (18,008 feet [5,489 meters]) in the Ruwenzori Range in central Africa. His party of scientists also conducted considerable surveying and mapping, and it brought back superb pictures of these so-called Mountains of the Moon, taken by the famed photographer Vittorio Sella. His third famous mountain adventure took place in 1909, when his expedition thoroughly mapped the region surrounding the Godwin Austen glaciers in the Himalayas. Before being forced to turn back, Abruzzi ascended to over 24,000 feet (7,315 meters) on K2, a peak he called the “third pole.”

In 1899–1900, Abruzzi commanded an Italian expedition to the Arctic, where an attempt was made to reach the North Pole from Franz Josef Land. One member of his party, Umberto Cagni, came within 209 miles (336 kilometers) of their destination. This expedition was the first Arctic success by a southern European nation. Promoted to admiral, Abruzzi served as commander in chief of the Italian navy from 1913 to 1917. After World War I and the rise of fascism in Italy, Abruzzi moved to Somaliland, where he died near Mogadishu on March 18, 1933.

[See also Africa, subentry on Scientific Exploration, and North Pole.]

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Acosta, José de (1540–1600), Jesuit missionary, philosopher, and theologian. Acosta was born at Medina del Campo, Spain, into a wealthy merchant family of Jewish ancestry. In 1552 he entered the Jesuits. After studying humanities, he was sent to Alcalá (1559–1567) for philosophy and theology, and here he was strongly influenced by the Dominican scholastic theologians Francisco de Vitoria and Domingo de Soto.

He taught theology in Spain from 1567 to 1571, before being sent to Lima, Peru, in 1572, where he taught theology and then served as rector at the Jesuit college. He was Jesuit provincial superior of Peru from 1576 to 1581. The important Third Provincial Council of Lima (1582–1583) entrusted him with drawing up its decrees and writing a catechism for use among Indians.

Acosta spent 1586 and early 1587 in Mexico, where he met the Jesuit Alonso Sánchez, who was advocating that Spain invade China. Acosta wrote a tract against this misguided scheme. He returned to Spain in 1587; two years later the Jesuit General Claudio Acquaviva appointed him visitor of the provinces of Aragon and Andalusia to suggest reforms among the Spanish Jesuits, partly to head off the threat that Philip II might commission a non-Jesuit visitor. He served as superior at Valladolid (1592–1595) and at Salamanca (1597–1600). During the in-
Historia natural y moral de las Indias. Title pages contain a great wealth of information; here we learn that Acosta was a Jesuit (note the Jesuit emblem), that he aimed at an all-compassing history, and that this first edition was published at Seville. COURTESY THE NEWBERRY LIBRARY, CHICAGO

terval he prepared three volumes of his sermons for publication.

Acosta's relations with Acquaviva were stormy. He told Clement VIII that Acquaviva was a tyrant. In Rome in 1594 Acosta attended the Fifth General Congregation of the Jesuits and strongly opposed its ban on men of Islamic or Jewish ancestry becoming Jesuits.

Acosta wrote two works of lasting influence. On Procuring the Salvation of the Indians was written in Mexico and published in Salamanca in 1588. Its six books reflect on the best ways to Christianize Native Americans. Acosta criticized Spanish treatment of Indians and questioned whether Spanish conquests were just wars. He argued that Spanish greed and cruelty hindered conversions. The last book of Procuring explores the problems that missionaries faced.

Acosta's second major work, Natural and Moral History of the Indies, contains a total of seven books and was published in Seville in 1590; Italian, French, German, Dutch, and English translations followed. Four books present a traditional view of the cosmos and earth, then discuss climate, geography, flora, fauna, and minerals in the Americas. Two books describe and evaluate Indian customs and religious practices, some positively, some negatively. The seventh book examines Mexican history before the Spanish conquest.

[See also Jesuits.]

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Aerial Survey. Aerial (or air) survey and the related topics of photogrammetry and remote sensing of the environment have a comparatively short history. Although dating essentially from the beginning of controlled flight in the early twentieth century, there are antecedents. From time immemorial humans have envied, and at times tried to emulate, the flight of birds—as the classical Greek myth of Icarus attests. However, before the end of the eighteenth century the best available “platforms” for viewing the Earth from above were mountains and hills, trees, or towers. Prior to the invention of viable photography, however, an aerial platform from which to take photographs was available in the form of the hot air balloon of the Montgolfier brothers, Jacques-Etienne (1745–1799) and Joseph-Michel (1740–1810), of France. At first the passengers were animals and birds, but soon humans were lofted, and shortly the hydrogen-filled balloon was developed. Anchored observational balloons were used by Napoleon Bonaparte (1769–1821), and also by both sides during the American Civil War (1861–1865) when sketch maps were made from aerial observations.

Age of Flight. Apparently, the first aerial photograph was taken in 1858 by the Frenchman Gaspard-Félix Tournachon (1820–1910), who preferred the name