and together they published *Travels in Lycia,* &c*.* (1847). Spratt investigated the caves at Malta and obtained remains of the pigmy elephant *(Elephas melitensis),* which was described by Dr H. Falconer. He investigated the geology of several Greek islands, also the shores of Asia Minor, and made detailed observa­tions on the Delta of the Nile. He was especially distinguished for his *Travels and Researches in Crete* (2 vols., 1865), in which he ably described the physical geography, geology, archaeo­logy and natural history of the island. He was commissioner of fisheries from 1866 to 1873; and acting conservator of the Mersey from 1879 until the close of his life. He died at Tunbridge Wells on the 10th of March 1888.

**SPRECKELS, CLAUS** (1828-1908), American capitalist, was bom in Lanstedt, Hanover, in 1828. In 1846, to escape army service, he emigrated to the United States and became a grocer. In 1856 he removed from New York City to San Francisco, where he set up as a grocer, then a brewer, and later a sugar refiner. He gradually obtained control of most of the sugar refineries on the Pacific coast; he was able to undersell his competitors because he bought his raw sugar in Hawaii, where he purchased large plantations and contracted for the produce of others. He built a large refinery in Hawaii, and his influence with the Hawaiian government was for a time paramount. By financing the Pacific Steamship Company he was able to reduce the freight charges on his sugar, and he also introduced various improvements in the methods of manufacture. It was he who built the railway from Salinas to San Francisco, by buying which the Atchison, Topeka & Santa Fé first made a through line into San Francisco. Spreckels died in San Francisco on the 26th of December 1908. His eldest son, John Diedrich Spreckels (b. 1853), became proprietor of the *San Francisco Morning Call* and succeeded to his father’s steamship interests; and another son, Rudolph Spreckels (1873- ), became

president of the First National Bank of San Francisco.

**SPREE,** a river of Prussia, Germany, rising in the district of Upper Lusatia, in the kingdom of Saxony, close to the Bohemian frontier, and flowing nearly due north past Bautzen, Spremberg and Cottbus, dividing between the first two towns for a time into tyro arms. Below Cottbus the river splits into a network of channels, and swings round in a big curve to the west forming the peculiar marshy region (30 m. long and 3 to 6 m. wide) known as the Spreewald. Having returned to its predominant direction, it turns W.N.W., and passing Fürstenwalde and Köpenick threads Berlin in several arms, and joins the Havel at Spandau. Its length is 227 m. of which 112 arc navigable; the area of its drainage basin is 3660 sq. m. It is connected with the Oder by the Friedrich Wilhelm or Müllrose Canal made in 1862-1868, which is 17 m. long, and by the Oder-Spree Canal, made in 1887-1888, and with the Havel by the Berlin- Spandau Navigation Canal, 51/2 m. long, and by the Teltow Canal completed in 1905.

**SPREEWALD,** a district of Germany, in the Prussian province of Brandenburg, a marshy depression of the middle Spree valley, extending to some 106 sq. m., its length being 27 m. and its width varying from 1 to 7 m. It owes its marshy character to the river Spree, which above Lübben splits into a network of over two hundred arms, and in seasons of flood generally overflows considerable portions of the region. In the parts which are especially liable to inundation, as, for example, the villages of Lehde, Leipe and Burg, many of the homesteads arc built each on a little self-contained island, approachable in summer only by boat, and in winter over the ice. In spite of its marshy character the Spreewald is in part cultivated, in part converted into pasturage, and almost everywhere, but more especially in the lower districts, wooded like a park, the predominant trees being willows. Fishing, cattle-breeding and the growing of vegetables, more particularly small pickling cucumbers, are the chief occupations of the people, about 30,000 in all. In great part they are of Wendish blood, and though the majority have been Germanized, there is a small residue who have faithfully preserved their national speech, customs, and their own peculiar styles of dress. The attractive blending of wood and water makes the Spreewald in summer a resort of the people of the Prussian capital, but also in winter the district is largely visited by people bent on skating, sleighing and other winter pastimes. The chief town is Lübben, 45 m. south from Berlin on the railway to Görlitz.

See W. von Schulenburg, *Wendische Volkssagen und Gebräuche aus dem Spreewald* (Leipzig, 1880); Kühn, *Der Spreewald und seine Bewohner* (Cottbus, 1889); and Braunsdorf, *Spreewaldfahrten* (Lübbenau, 1901).

**SPREMBERG,** a town of Germany, in the Prussian province of Brandenburg, situated partly on an island in the river Spree and partly on the west bank, 76 m. S.E. of Berlin by the railway to Görlitz. Pop. (1905) 11,188. There are a Roman Catholic and two Evangelical churches, a pilgrimage chapel, dating from 1100, a ducal chateau, built by a son of the elector John George about the end of the 16th century (now utilized as government offices), classical, technical and commercial schools and a hospital. It carries on considcrable manufactures of woollen cloth.

**SPRENGEL, KURT** (1766-1833), German botanist and physi­cian, was born on the 3rd of August 1766 at Bodelkow in Pome­rania. His uncle, Christian Konrad Sprengel (1750-1816), is remembered for his studies in the fertilization of flowers by insects—a subject in which he reached conclusions many years ahead of his time. His father, a clergyman, provided him with a thorough education of wide scope; and the boy at an early age distinguished himself as a linguist, not only in Latin and Greek, but also in Arabic. He appeared as an author at the age of fourteen, publishing a small work called *Anleitung zur Botanik für Frauenzimmer* in 1780. In 1784 he began to study theology and medicine at the university of Halle, but soon relinquished the former. He graduated in medicine in 1787. In 1789 he was appointed extraordinary professor of medicine in his *alma mater*, and in 1795 was promoted to be ordinary professor. He devoted much of his time to medical work and to investigations into the history of medicine; and he held a foremost rank as an original investigator both in medicine and botany. Among the more important of his many services to the latter science was the part he took in awakening and stimu­lating microscopic investigation into the anatomy of the tissues of the higher plants, though defective microscopic appliances rendered the conclusions arrived at by himself untrustworthy. He also made many improvements in the details of both the Linnaean and the “ natural ” systems of classification. He died of an apoplectic seizure at Halle on the 15th of March 1883.

Sprengel's more important works were: *Beiträge zur Geschichte des Pulses* (1787); *Galens Fieberlehre* (1788); *Apologie des Hippokrates* (1789); *Versuch einer pragmatischen Geschichte der Arzneikunde* (1792-1709); *Handbuch der Pathologie (*1795-1797); *Institutiones medicae (6* vols., 1809-1816); *Geschichte der Medicin* (completed in 1820); *Antiquitatum botanicarum specimen* (1798); *Historia rei herbariae* (1807-1808); *Anleitung zur Kenntniss der Gewächse* (1802-1804; and again 1817-1818); *Geschichte der Botanik* (1817- 1818); *Von dem Bau und der Natur der Gewächse* (1812) ; *Flora halensis* (1806-1815; and in 1832) ; *Species umbelliferarum minus cognitae* (1818); *Neue Entdeckung im ganzen Umfang der Pflanzenkunde* (1820-1822). He edited an edition of Linnaeus’s *Sy sterna vegetabilium* in 1824 and of the *Genera plantarum* in 1830. A list of his botanical papers from 1798 onwards will be found in the Royal Society’s *Catalogue of Scientific Papers.*

**SPRENGER, JAKOB** *(fl.* 1500), the Dominican inquisitor of Cologne, who with Heinrich Krämer (institor) published *Malleus maleficarum* or *Hexenhammer*, the standard textbook on witchcraft, especially in Germany. the book gives (1) evidences of witchcraft; (2) rules for discovering it; (3) proceedings for punishment.

**SPRENGTPORTEN, GÖRAN MAGNUS,** Count (1740-1819), Swedish and Russian politician, younger brother of Jakob Magnus Sprengtporten, entered the army and rose to the rank of captain during the Seven Years’ War. He assisted his brother in the revolution of 1772, and in 1775 was made a colonel and brigadier in east Finland. Here he distinguished himself greatly as an organizer and administrator. The military school which he founded at Brahelinnd subsequently became a state