enriched by the collections of his many journeys along the shores of the Mediterranean. In 1785 he was invited to Padua, but to retain his services his sovereign doubled his salary and allowed him leave of absence for a visit to Turkey, where he remained nearly a year, and made many observations, among which may be noted those of a copper mine in Chalki and of an iron mine at Principi. His return home was almost a triumphal progress: at Vienna he was cordially received by Joseph II., and on reaching Pavia he was met with acclamations outside the city gates by the students of the university. During the following year his students exceeded five hundred. His integrity in the manage­ment of the museum was called in question, but a judicial investigation speedily cleared his honour, to the satisfaction even of his accusers. In 1788 he visited Vesuvius and the volcanoes of the Lipari Islands and Sicily, and embodied the results of his researches in a large work *{Viaggi alle due Sicilie ed in alcune parti dell’ Apennino),* published four years later. He died from an apoplectic seizure on the 12th of February 1799, at Pavia.

His indefatigable exertions as a traveller, his skill and good fortune as a collector, his brilliance as a teacher and expositor, and his keenness as a controversialist no doubt aid largely in accounting for Spallanzani’s exceptional fame among his contemporaries; yet greater qualities were by no means lacking. His life was one of incessant eager questioning of nature on all sides, and his many and varied works all bear the stamp of a fresh and original genius, capable of stating and solving problems in all departments of science—at one time finding the true explanation of “ ducks and drakes ” (formerly attributed to the elasticity of water) and at another helping to lay the foundations of our modern vulcanology and meteorology. His main discoveries, however, were in the field of physiology : he wrote valuable and suggestive papers on respiration, on the senses of bats, &c., while he made experiments (1768) to disprove the occurrence of spontaneous generation, showing in opposition to J. H. Needham (1713-1781) that animalcules did not develop in vegetable infusions which had been boiled and were kept in properly closed vessels. His great work, however, is the *Dissertationi de fisica animale e υegetale (2* vols., 1780). Here he first interpreted the process of digestion, which he proved to be no mere mechanical process of trituration, but one of actual solution, taking place primarily in the stomach, by the action of the gastric juice. He also carried out important researches on fertilization in animals (1780).

**SPAN** (from **O.** Eng. *spannan,* to bind, connect together; the word is of general occurrence in Teutonic languages, the ultimate origin being the root *spa-,* to extend, stretch out, cf. Gr. σπάυ, to draw out, Lat. *spatium,* space), a distance stretched, the space between terminal points. The word was formerly used as a measure of length = 10∙368 in., taken from the stretch of the fully opened hand from thumb to little finger. The term is used in architecture for the width or opening of an arch or arched opening, and also the width of a roof between the wall plates. A “ span roof ” is a roof having two sides inclining to a centre or ridge, in contradistinction to a “ shed roof ” (see Shed).

**SPANDAU,** a town of Germany, in the Prussian province of Brandenburg, at the confluence of the Havel and Spree, 8 m. N.W. of Berlin, of which it is practically a suburb, on the main lines of railway to Hanover and Hamburg respectively. Pop. (1885), 31,463; (1895), 55,813; (1905), 70,295 (including a garrison of about 5000). The town has of recent years made marked progress, its trade being enhanced by an excellent railway service with Berlin and improved navigation on the Havel. The fortifications, which were strengthened after the war, 1870-71, for the protection of the arsenal, have been razed on the northern and eastern sides, and of its former defences none remain except the citadel and a line of works along a ridge of hills to the south of the town. The Julius tower in the citadel, which is surrounded by water, contains the Imperial war treasure (*Reichskriegsschatz),* —a sum of ₤6,000,000 in gold, kept in readiness for any warlike emergency, and reserved from the indemnity paid by France after the war of 1870-71. Spandau contains four Protestant churches, a Roman Catholic church, a gymnasium and a school of musketry. Besides numerous barracks, there are various military establishments appropriate to an important garrison town; and its chief industries are connected with the preparation of munitions of war. The government factories for the manufacture of small arms, artillery, gunpowder, &c., cover upwards of 20o acres, and employ about 6000 workmen. The other industries are not very important; they comprise miscellaneous manufactures, fishing, boat-building, and some shipping on the Havel.

Spandau is one of the oldest places in the Altmark, and received civic rights in 1232. It afterwards became a favourite residence of the Hohenzollern electors of Brandenburg, and was fortified in 1577-1583. In 1635 it surrendered to the Swedes, and in 1806 to the French. A short investment in 1813 restored it to Prussia.

See Zech and Günther, *Geschichtliche Beschreibung der Stadt und Festung Spandau* (Spandau, 1847), and Kuntzemüller, *Urkundliche Geschichte der Stadt und Festung Spandau* (Spandau, 1881).

**SPANDRIL,** or Spandrel (formerly *splaundrel,* a word of unknown origin), in architecture, the space between any arch or curved brace and the level label, beams, &c., over the same. The spandrils over doorways in Perpendicular work are generally richly decorated. At Magdalen College, Oxford, is one which is perforated, and has a most beautiful effect. The spandril of doors is sometimes ornamented in the Decorated period, but seldom forms part of the composition of the doorway itself, being generally over the label.

**SPANGENBERG, AUGUST GOTTLIEB** (1704-1792), Count Zinzendorf’s successor, and bishop of the Moravian Brethren, was born on the 15th of July 1704 at Klettenberg, on the south of the Harz Mountains, where his father, Georg Spangenberg, was court preacher and ecclesiastical inspector of the countship of Hohenstein. Left an orphan at the early age of thirteen, he was sent to the gymnasium at Ilefeld, and passed thence (1722), in poorest circumstances, to the university of Jena to study law. Professor Johann Franz Buddeus (1667-1729) received him into his family, and a “ stipendium ” was procured for him. He soon abandoned law for theology; took his degree in 1726, and began to give free lectures on theology. He also took an active part in a religious union of students, in the support of the free schools for poor children established by them in the suburbs of Jena, and in the training of teachers. In 1728 Count Zinzendorf visited Jena, and Spangenberg made his acquaintance; in 1730 he visited the Moravian colony at Herrnhut. A “ collegium pastorale practicum ” for the care of the sick and poor was in consequence founded by him at Jena, which the authorities at once broke up as a “ Zinzendorfian institution.” But Spangenberg’s relations with the Moravians were confirmed by several visits to the colony, and the accident of an unfavourable appeal to the lot alone prevented his appointment as chief elder of the community, March 1733. Meanwhile his free lectures in Jena met with much acceptance, and led to an invitation from Gotthilf Francke to the post of assistant pro- fessor of theology and superintendent of schools connected with his orphanage at Halle. He accepted the invitation, and entered on his duties in September 1732. But differences between the Pietists of Halle and himself soon became apparent. He found their religious life too formal, external and worldly; and they could not sanction his comparative indifference to doctrinal correctness and his incurable tendency to separatism in church life. Spangenberg’s participation in private observ- ances of the Lord’s Supper and his intimate connexion with Count Zinzendorf brought matters to a crisis. He was offered by the senate of the theological faculty of Halle the alternative of doing penance before God, submitting to his superiors, and separating himself from Zinzendorf, or leaving the matter to the decision of the king, unless he preferred to “ leave Halle quietly.” The case came before the king, and, on the 8th of April 1733, Spangenberg was conducted by the military outside the gates of Halle. At first he went to Jena, but Zinzendorf at once sought to secure him as a fellow labourer, though the count wished to obtain from him a declaration which would remove from the Pietists of Halle all blame with regard to the disruption. Spangenberg went to Herrnhut and found amongst the Moravians his life-work, having joined them at a moment when the stability of the society was threatened. He became its theologian, its