ment of director of the Gewandhaus concerts, but was rejected in favour of J. Rietz. In 1850 he was invited to Düsseldorf as musical director—a post in which Mendels­sohn had greatly distinguished himself many years pre­viously. Schumann retained this until 1853, when his mental powers began to decline rapidly through a disease of the brain from which he had long suffered, and of which he died at Endenich, near Bonn, 29th July 1856.

Schumann’s position in the history of German music is very important and marks the last stage hut one of its progress towards its present condition. His style was very advanced and strikingly original. His published works include one opera, four symphonies, five overtures, a series of scenes from *Faust,* and other choral and orchestral works written on a very extensive scale, and a large quantity of songs, pianoforte pieces, and other smaller works of the highest excellence and beauty.

SCHWABE, Samuel Heinrich (1789-1875), German amateur astronomer, was born on 25th October 1789 at Dessau, where he died on 11th April 1875 ; he observed the sun-spots regularly from 1826 and pointed out (in 1843) the periodicity in the number of these objects.

SCHWALBACH, or Langenschwalbach, a favourite German health resort, in the Prussian province of Hesse- Nassau, is pleasantly situated in the deep valley of the Münzenbach near its junction with the Aar, 12 miles north­west from Wiesbaden, with which it has regular communi­cation by diligence. Besides a large kursaal, the town has four churches, a synagogue, a real school, and a higher school for girls. The three principal springs, which are largely impregnated in varying proportions with iron and carbonic acid (compare Mineral Waters), are connected by promenades. The permanent population of the town was 2811 in 1880, and the number of visitors reaches about 5000 annually.

About 41/2 miles to the south of Schwalbach is Schlangen­bad (360 inhabitants), the thermal springs of which are efficacious in nervous complaints and attract about 2000 visitors (chiefly ladies) every year The water is used externally only.

SCHWANN, Theodor (1810-1882), author of the cell theory in physiology, was born at Neuss in Rhenish Prussia on 7th December 1810. His father was a man of great mechanical talents ; at first a goldsmith, he afterwards founded an important printing establishment. Schwann inherited his father’s mechanical tastes, and the leisure of his boyhood was largely spent in constructing little machines of all kinds. He studied at the Jesuits’ college in Cologne and afterwards at Bonn, where he met Johannes Müller, in whose physiological experiments he soon came to assist. He next went to Würzburg to continue his medical studies, and thence to Berlin to graduate in 1834. Here he again met Müller, who had been meanwhile trans­lated to Berlin, and who finally persuaded him to enter on a scientific career and appointed him assistant at the anatomical museum. Schwann in 1838 was called to the chair of anatomy at the Roman Catholic university of Louvain, where he remained nine years. He then went as professor to Liége, where, in spite of brilliant offers from many German universities, he led a very quiet un­eventful life, broken only by the international commemora­tion of the fortieth anniversary both of his professoriate and the publication of his *magnum opus,* till his death on 11th January 1882. He was of a peculiarly gentle and amiable character and remained a devout Catholic through­out his life.

It was during the four years spent under the influence of Müller at Berlin that all Schwann’s really valuable work was done. Müller was at this time preparing his great book on physiology, and Schwann assisted him in the experimental work required. His attention being thus directed to the nervous and muscular tissues, besides making such histological discoveries as that of the envelope of the nerve-fibres which now bears his name, he initiated those researches in muscular contractility since so elaborately worked

out by Du Bois Reymond and others. He was thus the first of Müller’s pupils who broke with the traditional vitalism and worked towards a physico-chemical explanation of life. Müller also directed his attention to the process of digestion, which Schwann showed to depend essentially on the presence of a ferment called by him pepsin, thus not only practically bringing the subject up to its modern state but preparing for the subsequent advances in medical treatment made by Roberts. Schwann also examined the question of spontaneous generation, which he aided greatly to disprove, and in the course of his experiments discovered the organic nature of yeast. His theory of fermentation was bitterly attacked and ridiculed by Liebig, but has been, after the lapse of a quarter of a century, triumphantly confirmed. In fact the whole germ theory of Pasteur, as well as the antiseptic application of Lister, is thus traceable to the influence of Schwann. Once when dining with Schleiden, in 1837, the conversation turned on the nuclei of vege­table cells. Schwann remembered having seen similar structures in the cells of the notochord (as had been shown by Müller) and instantly seized the importance of connecting the two phenomena. The resemblance was confirmed without delay by both observers, and the results soon appeared in the famous *Microscopic Investiga­tions on the Accordance in the Structure and Growth of Plants and Animals* (Berlin, 1839 ; trans. Sydenham Society, 1847), and the cell theory (see Morphology) was thus definitely constituted. In the course of his verifications of the cell theory, in which he traversed the whole field of histology, he proved the cellular origin and de­velopment of the most highly differentiated tissues, nails, feathers, enamels, &c. Although mistaken in his view of the origin of new cells, his generalization at once became the foundation of all modern histology, and in the hands of Virchow (whose cellular pathology is an inevitable deduction from Schwann) has afforded the means of placing modern pathology on a truly scientific basis.

An excellent account of Schwann’s life and work is that by Léon Frédéricq (Liège, 1884).

SCHWANTHALER, Ludwig Michael (1802-1848), German sculptor, was born in Munich on 26th August 1802. His family had been known in Tyrol by its sculptors for three centuries ; young Ludwig received his earliest lessons from his father, and the father had been instructed by the grandfather. The last to bear the name was Xaver, who worked in his cousin Ludwig’s studio and survived till 1854. For successive generations the family lived by the carving of busts and sepulchral monuments, and from the condition of mechanics rose to that of artists.

From the Munich gymnasium Schwanthaler passed as a student to the Munich academy ; at first he purposed to be a painter, but afterwards reverted to the plastic arts of his ancestors. His talents received timely encourage­ment by a commission for an elaborate silver service for the king’s table. Cornelius also befriended him ; the great painter was occupied on designs for the decoration in fresco of the newly erected Glyptothek, and at his suggestion Schwanthaler was employed on the sculpture within the halls. Thus arose between painting, sculpture, and architecture that union and mutual support which characterized the revival of the arts in Bavaria. Schwan­thaler in 1826 went to Italy as a pensioner of King Louis, and on a second visit in 1832 Thorwaldsen gave him kindly help. His skill was so developed that on his return he was able to meet the extraordinary demand for sculp­ture consequent on King Louis’s passion for building new palaces, churches, galleries, and museums, and he became the fellow-worker of the architects Klenze, Gärtner, and Ohlmüller, and of the painters Cornelius, Schnorr, and Hess. Owing to the magnitude and multitude of the plastic products they turned out, over-pressure and haste in design and workmanship brought down the quality of the art. The works of Schwanthaler in Munich are so many and miscellaneous that they can only be briefly indi­cated. The new palace is peopled with his statues : the throne-room has twelve imposing gilt bronze figures 10 feet high ; the same palace is also enriched with a frieze and with sundry other decorations modelled and painted from his drawings. The sculptor, like his contemporary painters, received help from trained pupils. The same prolific artist also furnished the old Pinakothek with twenty-five marbles, commemorative of as many great painters ; likewise he