

with Catalán and Mansion, published the *Nouvelle correspondance mathématique*; subsequently he collaborated with Mansion in publishing *Mathesis*.

BIBLIOGRAPHY

A portrait of Neuberg and a notice with a complete bibliography of his work by A. Mineur may be found in *Annuaire de l'Académie royale de Belgique*, **98** (1932), 135–192; see also L. Godeaux, in *Biographie nationale publiée par l'Académie royale de Belgique*, XXX (1958), cols. 635–637; and in *Liber Memorialis. L'Université de Liège de 1867 à 1935*, II (Liège, 1936), 162–175.

J. PELSENER

NEUMANN, CARL GOTTFRIED (*b.* Königsberg, Prussia [now Kaliningrad, R.S.F.S.R.], 7 May 1832; *d.* Leipzig, Germany, 27 March 1925), *mathematics, theoretical physics.*

Neumann's father, Franz Ernst Neumann, was professor of physics and mineralogy at Königsberg; his mother, Luise Florentine Hagen, was a sister-in-law of the astronomer F. W. Bessel. Neumann received his primary and secondary education in Königsberg, attended the university, and formed particularly close friendships with the analyst F. J. Richelot and the geometer L. O. Hesse. After passing the examination for secondary school teaching he obtained his doctorate in 1855; in 1858 he qualified for lecturing in mathematics at Halle, where he became *Privatdozent* and, in 1863, assistant professor. In the latter year he was called to Basel, and in 1865 to Tübingen. From the autumn of 1868 until his retirement in 1911 he was at the University of Leipzig. In 1864 he married Hermine Mathilde Elise Kloss; she died in 1875.

Neumann, who led a quiet life, was a successful university teacher and a productive researcher. More than two generations of future Gymnasium teachers received their basic mathematical education from him. As a researcher he was especially prominent in the field of potential theory. His investigations into boundary value problems resulted in pioneering achievements; in 1870 he began to develop the method of the arithmetical mean for their solution. He also coined the term "logarithmic potential." The second boundary value problem of potential theory still bears his name; a generalization of it was later provided by H. Poincaré.

Neumann was a member of the Berlin Academy, and the Societies of Göttingen, Munich, and Leipzig. He performed a valuable service in founding and editing the important German mathematics periodical *Mathematische Annalen*.

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I. ORIGINAL WORKS. Neumann's writings include *Vorlesungen über Riemanns Theorie der Abelschen Integrale* (Leipzig, 1865); *Untersuchungen über das logarithmische und Newtonsche Potential* (Leipzig, 1877); and *Über die nach Kreis-, Kugel- und Zylinderfunktionen fortschreitenden Entwicklungen* (Leipzig, 1881).

II. SECONDARY LITERATURE. See H. Liebmann, "Zur Erinnerung an Carl Neumann," in *Jahresberichte der Deutschen Mathematikervereinigung*, **36** (1927), 175–178; and H. Salié, "Carl Neumann," in *Bedeutende Gelehrte in Leipzig*, II, G. Harig, ed. (Leipzig, 1965), 13–23.

H. WUSSING

NEUMANN, CASPAR (*b.* Züllichau, Germany [now Sulechów, Poland], 11 July 1683; *d.* Berlin, Germany, 20 October 1737), *chemistry.*

The first child of a merchant-musician, Caspar Neumann was intended for the clergy. He learned music from his father and studied at the local Latin school. But, orphaned at the age of twelve, he had to go into pharmacy as an apprentice to his godfather. He showed such aptitude that three years later his guardian put him in charge of an apothecary shop, brewery, and distillery in nearby Unruhstadt. Neumann remained there until 1704, when the Great Northern War forced him to flee to Berlin. In the Prussian capital he soon became an assistant to the traveling pharmacist of Frederick I. As part of the royal entourage, he played the clavier for the king, he traveled throughout Germany and Holland, and he pursued a growing interest in science and medicine.

Neumann's serious scientific education began in 1711, when, apparently at the urging of the renowned royal physician F. Hoffmann, he was sent abroad to study chemistry. He first visited the Harz mining towns, where he learned assaying and smelting, and then went to Holland, where he inspected large chemical works and studied with Boerhaave. In 1713 he went to London, where he was stranded because of the recent death of his royal patron. He found employment as a laboratory assistant to the wealthy Dutch surgeon A. Cyprian, who spent £1,000 annually on chemical experiments. In his free time, Neumann gave private courses on chemistry and participated in the scientific life of London. After three years there he returned to Berlin to collect his belongings. Stahl, who had recently been made royal physician, persuaded Neumann to reenter Prussian service by obtaining a continuation of his travel stipend and promising him a position in the court apothecary shop. On his second tour Neumann first visited his friends in London. Then he proceeded