

Amsler (Later Amsler-Laffon), Jakob I

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(*b.* Stalden bei Brugg, Switzerland, 16 November 1823; *d.* Schaffhausen, Switzerland, 3 January 1912)

mathematics, precision instruments.

The son of a farmer, Amsler was educated at local schools before going on to study theology at the universities of Jena and Königsberg. At Königsberg he came under the influence of Franz Neumann, whose lectures and laboratory sessions he attended for seven semesters. After earning his doctorate in 1848, Amsler spent a year with Plantamour at the Geneva observatory; he went from there to Zurich, where he completed his *Habilitation* and began his teaching career. For four semesters he lectured on various topics in mathematics and mathematical physics, then in 1851 accepted a post at the Gymnasium in Schaffhausen. From this he hoped to gain some financial independence as well as an opportunity for more research. In 1854 Amsler married Elise Laffon, the daughter of a Schaffhausen druggist who was well known in Swiss scientific circles. Henceforth he used the double form Amsler–Laffon. The change applied to Jakob alone and was not adopted by his children.

Until 1854 Amsler's interests lay in the area of mathematical physics; he published articles on magnetic distribution, the theory of heat conduction, and the theory of attraction. One result of his work was a generalization of Ivory's theorem on the attraction of ellipsoids and of Poisson's extension of that theorem. In 1854 Amsler turned his attention to precision mathematical instruments, and his research resulted in his major contribution to mathematics: the polar planimeter, a device for measuring areas enclosed by plane curves. Previous such instruments, most notably that of Oppikofer (1827), had been based on the Cartesian coordinate system and had combined bulkiness with high cost. Amsler eliminated these drawbacks by basing his planimeter on a polar coordinate system referred to a null circle as curvilinear axis. The instrument, described in "Ueber das Polarplanimeter" (1856), adapted easily to the determination of static and inertial moments and of the coefficients of Fourier series; it proved especially useful to shipbuilders and railroad engineers.

To capitalize on his inspiration, Amsler established his own precision tools workshop in 1854. From 1857 on he devoted full time to the venture. At his death, the shop had produced 50,000 polar planimeters and 700 momentum planimeters. The polar planimeter marked the height of Amsler's career. His later research, mostly in the area of precision and engineering instruments, produced no comparable achievement, although it did bring Amsler recognition and prizes from world exhibitions at Vienna (1873) and Paris (1881, 1889), as well as a corresponding membership in the Paris Academy (1892). From 1848 until his death, Amsler was an active member of the Naturforschende Gesellschaft in Zurich.

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II Secondary Literature. See Poggendorf, Vols. III, IV, and V. The present article is based on the necrology by Ferdinand Rudio and Alfred Amster in *Vierteljahrsschrift der naturforschenden Gesellschaft in Zürich*, **57** (1912), 1–17, and on the extensive study by Fr. Dubois, “Die Schöpfungen Jakob und Alfred Amster’s auf dem Gebiete der mathematischen Instrumente anhand der Ausstellung im Museum Allerheiligen systematisch dargestellt,” in *Mitteilungen der naturforschenden Gesellschaft Schaffhausen*, **19** (1944), 209–273.

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