The German-American Connection:

William Würdemann, Camill Fauth and George N. Saegmuller

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The history of telescope making is filled with examples of competitive technological leapfrogging. Telescope makers and their respective countries continually outdid each other in size of instruments and corresponding astronomical discoveries; and during various periods, many European countries rose to the astronomical forefront only to be succeeded by a rival country with the latest in astronomical technology. Beginning with the Dutch, then the Italians and French, and culminating with the English and German firms, virtually all of the best telescopes came from Europe. It wasn't until Henry Fitz began his telescope enterprise in the mid-1800s that American telescope making warranted even so much as a mention in any dialogue concerning the great telescope houses of Europe. Although there was continual rivalry between countries and firms, there was also plenty of technology crossing borders as employees and their secrets moved between countries. A classic example of this was the transfer of Guinand's glass making technology from Germany to France and England in the 1800s. Another instance, less known, but worth examining, is the transfer of well developed German instrument making talent to America in the mid- to late 1800s.[1]

In 1807, Thomas Jefferson appropriated $50,000 to form the United States Coast Survey, but his fledgling country had virtually no instrument resources of it's own to equip the survey and so had to rely entirely on imported surveying equipment, chiefly from England. This was unacceptable to the newly independent government and "(m)uch the same way that navigation had a beneficial effect on the development of English scientific instrument making, so the needs of the Coast Survey accelerated and directed the development of precision instrument making in the United States". [1] While the Americans were determined to wean themselves of overseas instruments, they found themselves limited without the same skilled technicians as in Europe. Clearly they needed help and after decades of delays the head of the survey, Ferdinand Hassler, hired a 23 year old German immigrant instrument maker named William Würdemann.

Würdemann had studied in Heidelberg and in the Spring 1834 he started working for the Survey at a dollar per day. Within a year, his salary was doubled and his work was already considered indispensable to the dispatch of the survey. While chiefly concerned with the upkeep of the instruments, he assisted the second head of the survey, Alexander Bache, in constructing a temperature compensated base bar, called the "Bache-Würdemann Compensating Base Apparatus". [2] He continued to develop in skill and stature and continued work as the chief mechanic and instrument maker for the Coast Survey until 1849, when he went into business for himself. He stayed in Washington, D.C. and primarily produced surveying instruments for the Coast Survey and others. He enjoyed a cozy relationship with Bache and had the use of the Survey's machine tools. His son, Charles, also worked for the Coast Survey from 1870 to 1874. One of the most important assets that Würdemann had at his disposal was the Survey's dividing engine made by Troughton and Simms in 1847. However, it had centering problems and he eventually produced his own in conjunction with Gustav Heyde in Dresden.[3] With it, Würdemann was able to produce successively finer and more substantial instruments such as portable transit and zenith instruments and it is here that the connection is made with the American telescope industry. He had plenty of business and in 1849, Würdemann recruited Edward Kubel, another German trained instrument technician as his foreman. Emigrating from Bavaria, Kubel worked for Würdemann for 25 years, until Würdemann retired. He then ran his own successful shop nearby. However, Wurdemann also brought over two other German recruits. They were Camill Fauth and George N. Saegmuller, and both realized there was business enough for all. They only worked for the elderly Würdemann from 1870-1874 and then they began their own firm along with a family relation, trading under the name Fauth & Co. until 1892. Fauth & Co., continued to make surveying, measuring, transit and zenith instruments but also began making astronomical telescopes, which Saegmuller had prior experience producing.

Camill Fauth ran Fauth & Co. while Saegmuller, a partner, also worked for the Coast Survey. Saegmuller became supervisor of the instrument shop in 1876, and remained there until 1885 when,

following Fauth's retirement, he became manager and sole proprietor of Fauth & Co. [4] It was during his period at the Coast Survey that Saegmuller used and repaired the original Troughton & Simms dividing engine owned by the Survey. Würdemann, older now but still healthy, kept his own shop until 1881. He died on February 22, 1900 of pneumonia at the age of 90. Fauth & Co. offered many types of instruments ranging from surveying, navigation, and oceanographic to laboratory and astronomical instruments. Unlike other purveyors of instruments such as Queen & Co. or Benj. Pike, Jr., Fauth & Co. appears to have made all of their instruments in their own shop, with the exception of lenses and mirrors, [5] and Fauth & Co. (likely Saegmuller) built their own dividing engine for use in their shop. [6] Lenses for refractors were procured from the Clarks [7], Bausch and Lomb [8], and Mertz [9], and mirrors were purchased from the new firm of John A. Brashear, [10] who had recently perfected an improved silvering process. Reflectors were offered in diameters up to 15". Mounts could be purchased separately, or with a tube designed by the company. The largest telescope known to be produced by Fauth is the 8" refractor for Santa Clara University.

While not much is known about Camill Fauth's German apprenticeship, much more is certain about his partner, Saegmuller. Saegmuller was born on February 13, 1847, in Bavaria and first attended public school and then technical schools at Erlangen and Nuremberg [11]. Saegmuller was known to have apprenticed first with Repsold in Germany, and then with Cooke in England before emigrating to Washington, D.C. Early Fauth telescopes bear a resemblance to their heavy-mounted German precursors, but there are also influences from Cooke refractors as well. Fauth's "EQUATORIAL 02", shown on page 12 of the 1883 catalogue bears a strong resemblance to 6" and 8" Cooke models of the same period. Both have round, flanged piers and the mounts have long polar shafts protruding almost to the eye end of the tube assemblies. Saegmuller also appears to have had a good working knowledge of celestial coordinates and navigation as well as surveying and engineering. He developed a new form of solar attachment for engineers transits which easily and accurately allowed a surveyor to determine the local meridian, offering quick determination of the local magnetic deflection.

Following Fauth's retirement, Saegmuller assumed leadership of the company and continued in the same general line of instruments and telescopes. By 1892, he had changed the name to Geo. N. Saegmuller Co., and was operating at a new location. He produced larger telescopes than the previous Fauth & Co. including a large, adjustable equatorial mount and clock for New York businessman Edward Matthiesson's 8" Henry G. Fitz tube assembly [12]; a 12" refractor with a Clark lens for the U.S. Naval Observatory (cover photo); a 12" refractor for Georgetown University, Wash., D.C.; a 19" refractor with a Merz lens for Manila Observatory (the lens was destroyed during the second World War), and a 20" refractor with a Clark lens for Chamberlain Observatory. He was also an early proponent of aluminum as a material with great potential for telescope tube components and surveyors transit parts .[13], [11] Saegmuller also further developed the firm's capabilities in astronomical instruments such as the large micrometer produced for Lick Observatory which was used for nearly ten years by Burnham in his double star research. [14]

Saegmuller was a versatile inventor as well. Among his many accomplishments, he perfected the mechanical tide-predicting machine devised by Professor Ferrel of the Coast Survey, and he produced range finders and gunsights for artillery and naval guns. He also designed a water tower for Arlington County, Virginia. In 1905, Saegmuller merged his company with the Bausch & Lomb Optical Co. of Rochester, N.Y., and the concern became Bausch, Lomb, Saegmuller Co. The old Bausch & Lomb Optical acted as the distribution arm. [15]

Interestingly, the new firm's catalogue included drawings of instruments that appear in the earlier Fauth & Co. and Saegmuller catalogues and certainly the Large Dividing Engine in their catalogue is the original machine from the Fauth & Co. shop. There appeared to be very little different in the product line, although it was expanded somewhat. According to Turner, "A few years later this firm signed agreements with the Carl Zeiss Optical Works in Jena to form the 'Triple Alliance' of the new Bausch & Lomb Optical Co. Saegmuller was in charge of the engineering and astronomical instrument division of this endeavor until his retirement in 1926". [16] Sometime before 1920, an 11" B.L.S. Co. telescope sporting a Zeiss lens was built for the company's own observatory. It first resided in a park and then it was moved to a new observatory on top of a company building. [17] Upon retirement, Saegmuller returned to live out his years in Arlington, Virginia near Washington, D.C. He died on his 87th birthday, on Feb. 13th, 1934.

After the formation of the "Triple Alliance" with the Carl Zeiss Co., the German-American optical instrument circle became complete, but it wasn't to last long with the coming of the next World War.

REFERENCES:

i.This article is meant to show the relationship between the American immigrant experience and the country's growing technological demands. It is not a detailed study of the instruments themselves and further research is clearly warranted to document the work of these two important German-American telescope makers, Fauth and Saegmuller. Their mechanical work holds it's own against any maker. Although these two men were primarily known for their surveying and transit instruments, their telescopes are now considered very desirable and historically valuable.

ii. The first known telescope made with aluminum components appears to be the 5" Comet Seeker by Brashear, circa 1886, and produced for William Harkness of the U.S. Naval Observatory.

[1] Turner, Steven, William Würdemann: First Mechanician of the U.S. Coast Survey, Rittenhouse, V.5, no.4. p. 98 1991
[2] ibid, p. 99
[3] ibid, p. 101
[4] ibid, p. 108
[5] Fauth & Co., Catalogue of Astronomical and Surveying Instruments, 1883 (Courtesy of ATS member Peter Abrahams)
[6] Ambronn, L. , Handbuch der Astronomischen Instrumentenkunde, V.1, p.445, (fig. 463, p. 446) 1899
[7] 8" lens, Santa Clara University; 12" Lens, U.S. Naval Observatory
[8] Turner, Steven William Würdemann: First Mechanician of the U.S. Coast Survey, Rittenhouse, V.5, no. 4. p.108 1991
[9] Dimitroff and Baker, Telescopes and Accessories, p. 286, 1945
[10] Fauth & Co., Catalogue of Astronomical and Surveying Instruments, 1883 (Courtesy of ATS member Peter Abrahams)
[11] Evening Star, Washington D.C., Obituary, Feb. 14, 1934
[12] Author's private collection
[13] Saegmuller, Geo. N., Description and Price List of First Class Engineering & Astronomical Instruments, 1892 (courtesy of ATS member Ken Launie)
[14] Todd, David P., Stars and Telescopes, p. 342-343, illust., 1905
[15] Bausch, Lomb, Saegmuller Co., Astronomical, Engineering and other Instruments of Precision, p. 4, 1907
[16] Turner, Steven William Würdemann: First Mechanician of the U.S. Coast Survey, Rittenhouse, V.5, no. 4. p.108, 1991
[17] Saegmuller, Geo., The Bausch & Lomb Observatory, The Reflector, B.L.S. Co. , p. 4, May 1920

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