



ArtiFacts

ArtiFacts: Bernhard Heine's Osteotome

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When Bernhard Heine (1800–1846) was just 10-years-old, his parents sent

him to his uncle's workshop in Würzburg, Germany to begin an apprenticeship as an orthopaedic technician. He was in good hands. His uncle, Johann G. Heine, is widely considered the founder of orthopaedics in Germany [3, 4, 9], having opened the Caroline Institute (Karolinen-Institut, named after the Bavarian Queen Caroline), the first orthopaedic institution in Germany, in 1816. Johann's renowned workshop in Würzburg manufactured artificial limbs, wheelchairs, and other orthopaedic devices.

Like his uncle Johann, Bernhard Heine had a natural talent for crafting orthopaedic devices, but lacked a formal medical education. Instead, Bernhard Heine attended anatomical lectures and surgical demonstrations. At the age of 20, he traveled the world to further his medical education [9]. Upon his return, Heine practiced medicine and surgery, specializing in orthopaedic surgery. He designed and built many of his own instruments and appliances, but none as important or

widely renowned as the chain osteotome, which he developed in 1830.

Heine's design, similar to the modern chainsaw, cut through bone quickly, without the patient enduring blows from a hammer and chisel or jarring from a regular amputation saw—an important advancement at a time when anesthesia was rarely employed. Surgeons could perform resections and even craniotomies without leaving bone splinters or damaging surrounding tissue [5, 6]. The example held by the National Museum of Health and Medicine, however, illustrates the complexity of the instrument (Fig. 1). Several guards on the saw could be configured to minimize the cutting surface and prevent soft-tissue damage. A rod with a screw tip served as a pivot for craniotomies. The saw required considerable skill to use, and few could wield it as well as Heine.

Still, the invention brought great fame to Heine. In 1835, he was awarded the prestigious Monthyon Prize by the Académie Française. He then spent 6 months in Russia demonstrating the instrument as a guest of the Czar [4].

Osteotomes were manufactured in Germany by Bernard Heine and in France by Charriere et Fils. George Tiemann and Co. of New York, eager to

A Note from the Editor-in-Chief:

We are pleased to present our latest ArtiFacts column. In each installation, the Collections Manager of the Historical Collections Division of the National Museum of Health and Medicine (NMHM) will present a photograph of a visually or historically interesting artifact from the museum's collection, and provide the story behind the picture. Now a National Historic Landmark, the NMHM was originally developed from the Army Medical Museum, which was established during the Civil War to collect "specimens of morbid anatomy together with projectiles and foreign bodies removed." Its mission today is to inspire interest in, and promote the understanding of, medicine to the public.

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Fig. 1 Heine's design, similar to the modern chainsaw, cut through bone quickly, without the patient enduring blows from a hammer and chisel, or the jarring from a regular amputation saw. (This image has been manipulated by using dodging and burning techniques. It has been cropped to emphasize the subject. National Museum of Health and Medicine photo illustration by Matthew Breitbart/Released).

demonstrate that they were a world-class producer of surgical instruments, manufactured this chain osteotome in the United States with a tortoise shell handle and gold plated parts [8]. It was displayed at the 1872 Exposition universelle de Lyon to demonstrate virtuosity in surgical instrument fabrication, and was awarded both the silver and bronze medal, which they proudly included on the title page of subsequent

catalogs. The instrument was donated to the Army Medical Museum after the exposition, only to be borrowed for the 1876 Centennial Exposition [1, 2]. Tiemann subsequently marketed the osteotome for USD 300 in the 1872 catalog compared with USD 5 for a standard capital saw or USD 191 for a Buck's general operating set [7].

Perhaps the importance of the chain osteotome was more symbolic than

practical; it demonstrated that orthopaedic surgery was not only a medical specialty, but one that merited prestige.

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