

# Curator's Choice

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## Strange Voices: The Lesser-known Origins of the Harmonica

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Between 2008 and 2019, archaeological fieldwork was done on the Richard J. Duckett site (18PR955) ahead of the construction of a retirement community. The property called the “Enclave at Beechfield A” contained a plantation yard that was in use from the late 18th through the early 19th century, and a tenant house dating to the turn of the last century (Samford 2016). Harmonica reed fragments (see Figure 1) were recovered in a test unit associated with a temporary wooden structure or outbuilding.



Figure 1: Harmonica reed plate fragments from the Richard J. Duckett site/Enclave at Beechfield A.

Over the centuries, the harmonica has become an iconic instrument, featured prominently in genres like the blues, folk, and rock music. Virginia Ternisien presented an overview of the harmonica's history in her July 2013 Curator's Choice article, as well as a brief discussion of the structure of the

instrument and degradation of its components in archaeological contexts. But in between the Chinese *sheng* (see Figure 2) – heralded as the ancestor of the harmonica – and the Hohner Company's mass-production of the modern harmonica, there's an even stranger origin story that many overlook (Knopper 2021).

In 1780, the St. Petersburg Academy of Sciences issued a challenge: explain how different vowel sounds were made, and to replicate those tones with a device. A German physicist named Christian Gottlieb Kratzenstein answered the call. Luckily, he had already been hard at work for at least a decade prior to the competition on this exact scientific mystery. Many think that his “talking machine” was modeled after the Chinese *sheng*, but it was considerably bigger – estimated to be the size of a modern day piano (Great Big Story 2023).

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Figure 2: An example of a Chinese sheng (Metropolitan Museum of Art 2024).

Kratzenstein theorized that sound in humans was produced by the epiglottis, or the flexible covering behind the tongue and above the trachea (Harvard Health Publishing 2022). According to his theory, the epiglottis worked like a valve and vibrated as air flowed past it via the lungs. His “talking machine” implemented this idea with a series of “flutes”, each of which was fashioned from tubes cut in half lengthwise, with one end open to airflow and the opposite end closed. Each tube was then covered with a free reed that was made from a material that could bend and vibrate as air was pumped through the tube (see Figure 3), thus producing sound (Ohala 2011:157).

Subsequent explorations of the human voice proved his theory incorrect, but Kratzenstein's simple device ultimately won the competition and revolutionized not only the harmonica, but other related instruments such as the accordion, saxophone, and the reed organ (Frederick Acoustic 2024). His work inspired other innovators to scale his creation down to a more manageable size, resulting in the modern harmonica that emerged in the 1820s in Europe (Knopper 2021). Like Kratzenstein's machine, the modern harmonica utilized thin, brass reeds positioned over slots that vibrated as air passed through the instrument (Yerxa 2016).

The modern harmonica owes its unique sound to not only the Chinese *sheng* instrument, but also to the work of later inventors whose efforts to fine-tune Kratzenstein's use of free reed technology gave us the music we enjoy today. The context of the building associated with the harmonica fragments at the Richard J. Duckett site matches the timeframe of the availability and increasing popularity of the harmonica in the United States during the latter half of the 19th century (Ternisien 2013). It's unlikely that we'll ever know to whom the harmonica fragments belonged. But the portability, simplicity, and unique sound of the harmonica undoubtedly brought the harmonica's owner joy and respite.

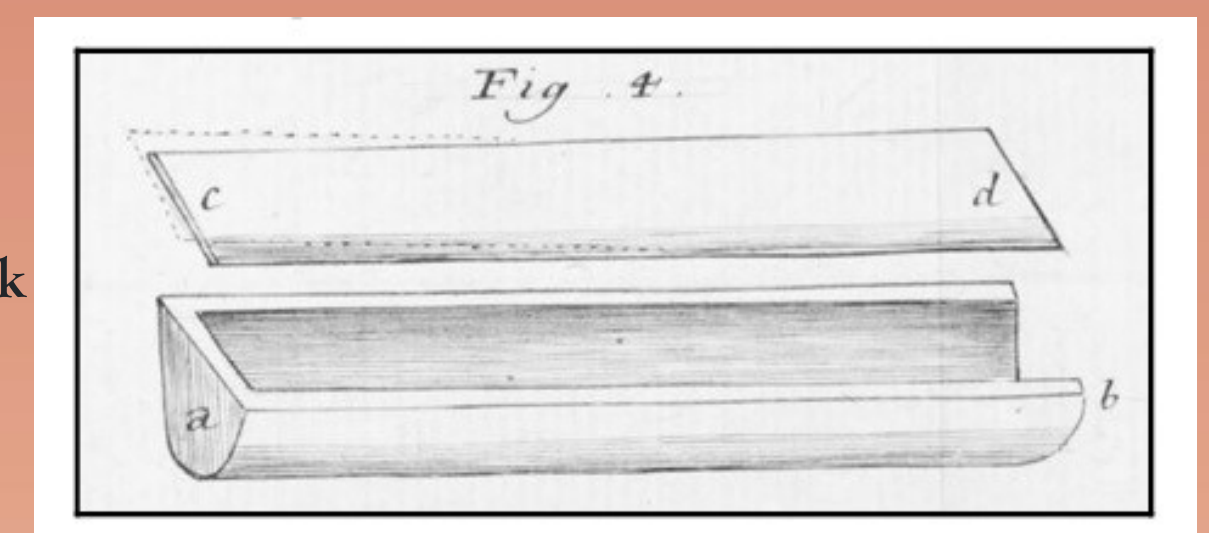


Figure 3: Diagram of one of Kratzenstein's “flutes” for his talking machine (Ohala 2011:157).



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