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How the sheng became a harp

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ABSTRACT

In the first few decades of the nineteenth century, a new family of free-reed keyboard instruments – including accordions, harmoniums, and parlour organs – became hugely popular throughout Europe. Although these instruments relied on a novel acoustical technology borrowed from an ancient Chinese mouth organ known in the West since the seventeenth century, instrument makers and music critics alike consistently described the sounds they produced using ideas native to a Romantic tradition of affective discourse around windblown strings and spiritual transcendence. This essay traces the European reception of free reeds and interrogates the conditions under which keyboard instruments based on a Chinese technology came to be heard as embodying the properties of a very different instrument: the Aeolian harp. Although various agendas collaborated in obscuring the East Asian origins of the free-reed technology, it seems highly probable that changing political and racial contexts – most notably around 1830 – directly affected the ways in which the reeds were both heard and understood. Studying the appropriation of free reeds by the West as well as the technology's postcolonial afterlives, I argue, can help us better understand the conditions under which sound objects are assimilated or rejected in changing cultural settings.

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In 1791, while employed as *Kapellmeister* at the court of King Gustav III of Sweden, the Abbé Joseph Vogler – organist, composer, theorist, and pedagogue – published a collection of pieces titled *Polymelos ou Caractères de musique de différentes nations*, arranged for piano with optional string quartet accompaniment. The set featured various folk songs including an *Air Chinois*, a *Romance Africaine*, an *Air Finois*, an Estonian March, and four pieces *à la Suède*. Vogler's compilation celebrated the diversity of musical genres that the author had himself experienced on his travels throughout the Russian empire and the North African coast, as well as his access to various dignitaries, such as the Chinese diplomat who had allegedly taught him the melody of “Cheu Teu” in London (Figure 1).

The very same period saw Vogler embarking upon his famous “Simplification System” programme for organ reform, a project that was inspired by his encounter with the technology of free reeds. Unlike the hollow pipes found in organs, wind instruments, and bagpipes, free reeds feature a free-standing tongue running throughout the length of an individually encased pipe, which vibrates when air flows past, producing sound. This



Figure 1. Mm. 1–6 of Vogler's *Cheu Teu: Air Chinois*.

technology originated in the ancient Chinese mouth organ, the *sheng*, which had only recently been brought to Europe. In line with his cosmopolitan predilections, Vogler appears to have first heard about free reeds while visiting Russia with members of the Swedish court (Grave and Grave 1987, 249).

Contrary to what one might expect given his interest in non-Western music, the Abbé remained silent about non-Western *instruments*, and avoided any mention of the Chinese origins of free reeds when pursuing his organ reforms. In many ways, his attitude epitomises what we might regard as an organological exception to the orientalist fascinations of the eighteenth century, evident in the musical writings of Rameau, Roussier, and Ginguéné, among others.¹ By the 1830s, as Myles Jackson has shown, dozens of new free-reed instruments, including various proto-harmoniums and accordions, had been independently invented, or reinvented, throughout Europe (Jackson 2006). Yet almost without exception, no mention can be found of their East Asian heritage. Instead, free reeds – a newly imported material technology – were linked to a distinct extant metaphorical domain, namely the affective discourse around windblown strings, much of which invoked Romantic notions about the world soul, ether, and spiritual transcendence. The genealogy of the resulting hybrid “sonic thing” can help us understand the global context of the development of a key family of instruments in the West, contributing to current discourses in sound studies and critical organology that seek to emphasise the movement of objects, technologies, and sounds across culturally and geographically dispersed networks of knowledge.² Naturally, this story begins in Ancient China.

The sheng in Europe

Textual and archaeological evidence suggests that the sheng has been an integral part of Chinese musical culture at least since the West Zhou period (1100–771 BCE) (Ben 1998, 18). Four exemplars of the instrument were discovered in the Tomb of Marquis Yi of Zeng (after 433 BCE) (von Falkenhausen 1993, 9–10), and numerous Tang dynasty (618–907) depictions of the instrument can be found in murals in the Temples of Dunhuang (Marks 1932, 601). Although various avenues of propagation westward have been proposed – ranging from ancient travellers along the Silk Road to Marco Polo himself (1254–1324) (Ord-Hume 1986, 18–20) – the first documented appearance of the technology in Europe is in Marin Mersenne's *Harmonie universelle*, with its illustration of what is clearly a *khaen*, a Laotian sheng, which Mersenne erroneously describes as Indian instrument (1637, 308).

Images of the sheng also feature in Filippo Bonanni's *Gabinetto armonico* (1722) and in Franciscus Blanchini's *De tribus generibus instrumentorum* (1742), although the explanations given in all three of these texts indicate that the instrument's mechanism was profoundly misunderstood.³

In the second half of the eighteenth century, more concrete information about the sheng began to accrue in Europe alongside a growing interest in Chinese culture. In 1770, Jacob von Stählin described the instrument as "the charming Chinese organ",⁴ and reported on a German expatriate in St. Petersburg who had learned to play arias, minuets, and other pieces on the instrument (1770, 192). In 1779, the Jesuit missionary Jean-Joseph-Marie Amiot discussed the sheng at length in his *Mémoire sur la musique des Chinois* (1779), and a year later, Jean-Benjamin de la Borde included detailed images of the instrument in his *Essai sur la musique ancienne et moderne* (1780).⁵

The eventual transmission of free reeds from the sheng to organ pipes was accomplished by the German physician Christian Gottlieb Kratzenstein, who spent most of his career at the University of Copenhagen. The exact details of his initial encounter with the technology have been lost, but at least one contemporary reported that Kratzenstein had been inspired by a sheng (likely the instrument listed in a 1674 inventory of the Royal Danish *Kunstkammer*) (Wilke 1823, 152; see also Müller 1987, 403). In 1780, Kratzenstein submitted a monograph to a scientific competition held by the St. Petersburg Academy of Sciences, in which he hypothesised that the vibration of the epiglottis, rather than that of the vocal cords, affected the tone of voice (Ohala 2011, 157). As accompanying evidence, he presented an organ-like machine that imitated the five cardinal vowels by means of differently shaped pipes with vibrating tongues. This instrument, which was built by Franz Kirsnick, a German organ builder who had worked in Copenhagen and St. Petersburg, was the first free-reed instrument fabricated in the West (see Wilke 1823, 150–156).

In 1788, Vogler visited St. Petersburg, where he learned about Kratzenstein's prize-winning essay and invention, and he soon commissioned Kirsnick's assistant, Georg Christoffer Rackwitz, to add free reeds to new hybrid organs he was designing in Rotterdam and Frankfurt, as well as his own portable orchestrion. Touring Europe with his Simplification System, the Abbé zealously promoted the reform of traditional organs by substituting registers of free reeds in place of standard organ pipes. These, he argued, could greatly increase expressivity and reduce costs.

Thanks to Vogler's efforts, the free-reed technique spread rapidly among organ builders. In France, Gabriel-Joseph Grenié, an amateur organ builder, began to experiment with free reeds around 1798, culminating in his invention of the *orgue expressif* (1810), which employed a foot pedal to create dynamic swells by varying air pressure into a free-reed register. Grenié's instrument is generally regarded as the earliest modern harmonium (I will henceforth use this general term to describe similar button- or keyboard-operated free-reed instruments). The ensuing variety of new inventions in this family includes Eschenbach's *clavaeoline* (1813), Schlimbach's *aeoline* (1815), Voit's *aeolodicon* (1820), and Brummer's *aeolmelodicon* (1825), among many others.

Nationalising free reeds

The extent to which free reeds were imagined either as European or Chinese in this period is unclear. In his patent application from 1810, Grenié noted that free-reed organs had

previously been built by Vogler and Érard, but made no mention of Kratzenstein's experiments or the origins of the technique in the sheng. Six years later, the French physicist Jean-Baptiste Biot attributed the invention of the technique wholly to Grenié (1817), as did the physiologist François Magendie (1816, 221). In contrast, a lengthy essay by the composer and organ builder Friedrich Wilke in the *Allgemeine musikalische Zeitung* (1823) traced the invention to Kratzenstein, Rackwitz, and Vogler, ignoring Grenié entirely.⁶ In his essay, Wilke cited a letter from Rackwitz to the effect that Kratzenstein had borrowed the free-reed technology from a sheng, but did not otherwise affirm or discuss the Chinese origins of the instrument, preferring instead to survey the competing claims of various German organ builders at length (Wilke 1823, 152).

Wilke's almost complete omission of the sheng is striking, given that the relationship between free reeds and the Chinese sheng had been emphasised by at least three authors in the same journal only a few years earlier, with François-Louis Perne's report on Grenié's organ, which invoked Amiot's account of the sheng; Ernst Chladni's detailed essay on the acoustical properties of the sheng, which included a diagram of all its parts (Figure 2); and Gottfried Weber's diatribe against the Frenchman Biot, which emphasised the primacy of Kratzenstein and Vogler despite conceding that the honour was ultimately due to the Chinese.⁷

In 1825, Wilke published an addendum to his earlier study in which he acknowledged that while Kratzenstein may well have been inspired by a Chinese mouth organ, a passage in Michael Praetorius's *Syntagma Musicum* (1619) firmly established the existence of free reeds in an unusual organ in Hessen at the beginning of the seventeenth century.⁸ Although Praetorius's text by no means conclusively indicates the presence of free reeds, Wilke interpreted his account as definitive proof of the technology's Teutonic origins, and argued that free reeds had been independently discovered – by Germans – twice: first by the anonymous seventeenth-century craftsman who had built the Hessian organ, and again by Kirsnick, who had been the first to successfully implement the free-reed design in his instrument. Clearly, Wilke maintained, Germany had such an abundance of talented organ makers in the seventeenth century that it was exporting, rather than importing, craftsmen at the time (Wilke 1825, 265).

In 1837, François-Joseph Fétis weighed in on this debate in his entry on Grenié in the *Biographie universelle*. Ignoring Wilke's attribution of the instrument to Praetorius, he granted Weber's point that Kratzenstein seemed to have been the first to use free reeds in organ pipes, and admitted that various Germans, including Vogler, had employed them soon after. However, he argued, Grenié too had discovered this technology independently, as attested by the fact that the Frenchman had never been to Germany and did not understand a word of German.⁹ In spite of explicitly referring to Weber's article in the *Allgemeine musikalische Zeitung*, Fétis did not make any mention of the sheng.¹⁰

The musical community's palpable disregard of the Chinese origins of free reeds in favour of competing claims of individual rediscovery stands in stark relief to the response of another group who were also interested in the technology, namely acousticians. Unlike instrument designers, at least some acousticians seem to have consistently engaged with – and celebrated – the technology's East Asian origins. For example, in 1829, the *Allgemeine musikalische Zeitung* reviewed a free-reed mouth organ that had been christened the *Neue Tschiang* by the acoustician Friedrich Mehwald – the only case I have found where the name of a new Western free-reed instrument reflected its Chinese

II. Beylage zu No. 22. der allgem. musikal. Zeitung. 1821.

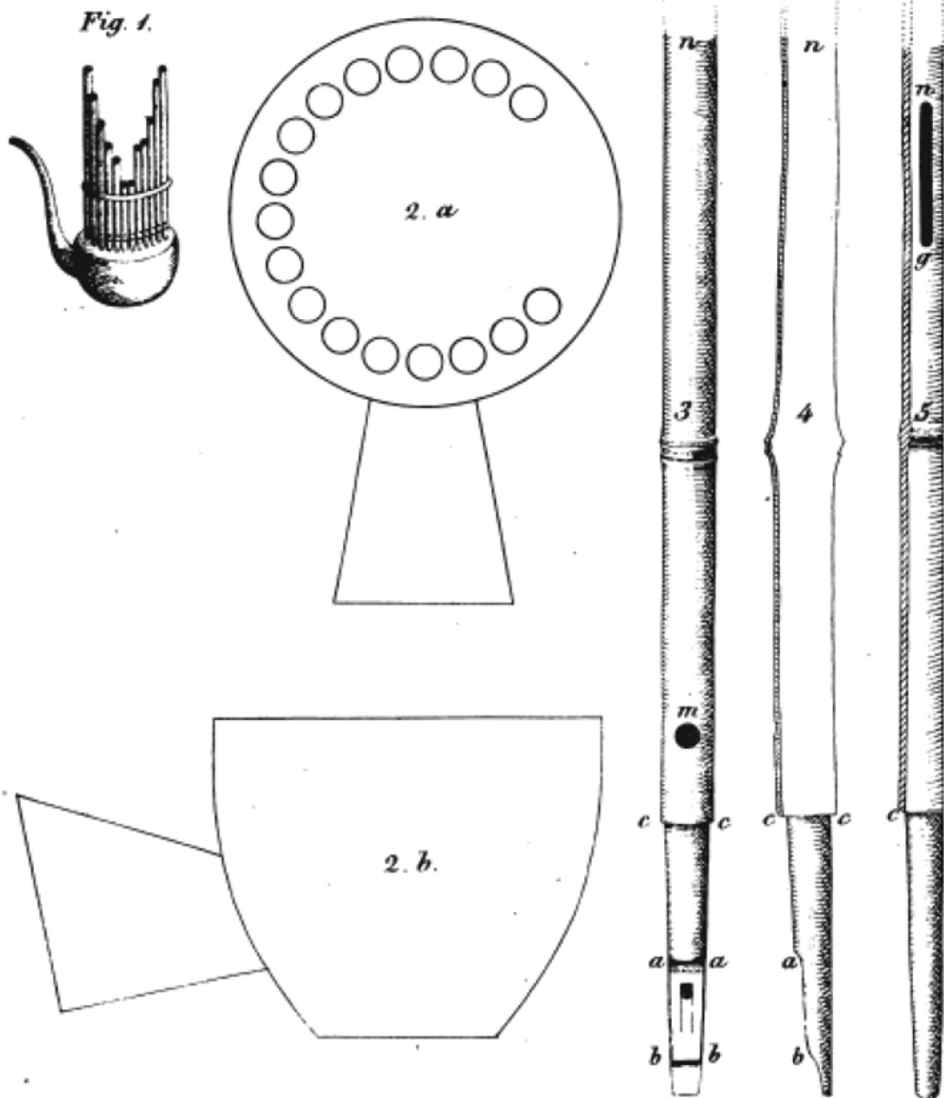


Figure 2. Chladni's diagrams of the parts of the sheng. An illustration of the entire instrument can be seen at the top left.

heritage (Figure 3) (Gaßner 1849, 845). That same year, Charles Wheatstone discussed the "Tsing, or Chinese organ" in his patent for various improvements of free-reed instruments (Figure 4), and two years later, the acoustician Robert Willis presented his research on vowels, alongside "the application of the principles thus discovered in the *Chinese organ* or *Ching*" (Philosophical Society 1832, 452).

From the cases described above, it appears that knowledge about the free reed's Chinese origins was generally available. However, this information was alternately

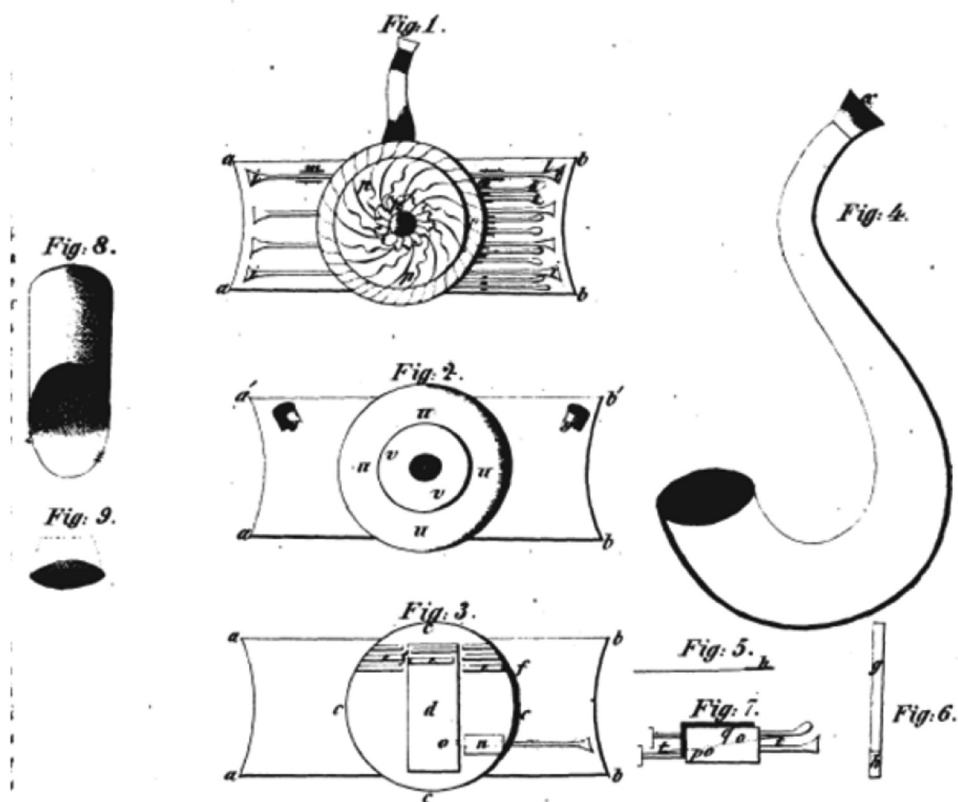


Figure 3. Reichstein's *Neue Tschiang*, printed in the *AMZ*.

obscured and flaunted in the service of nationalistic disputes between musicians, instrument designers, and scientists. French writers generally held that the technology originated with Grenié, whereas German critics generally traced the technology to Kratzenstein, Kirsnick, and Vogler, while conceding the possibility of a vague Chinese link.

Recontextualising free reeds

Within the span of a few decades, instruments of the harmonium family – ranging from foot-operated parlour organs to accordions and mouth harmonicas – had grown from rare curiosities to a mass-produced staple of musical life in Europe and North America. By the 1860s, harmonium builders appear to have obtained a market share equal to piano makers.¹¹ Curiously, in spite of the growing popularity of such free-reed instruments, it appears that the technology was rarely, if ever, associated with Chinese music. This surprising phenomenon requires additional investigation.

Of course, it is entirely possible that some instrument designers were not fully aware of the fact that the technology was Chinese in origin, or, if they did know of the connection, regarded it as immaterial to their adoption of what was essentially an artisanal technique. Yet the considerable ink spilled in arguments about the purported “invention” of free reeds suggests a significant investment in establishing the technology as indigenously

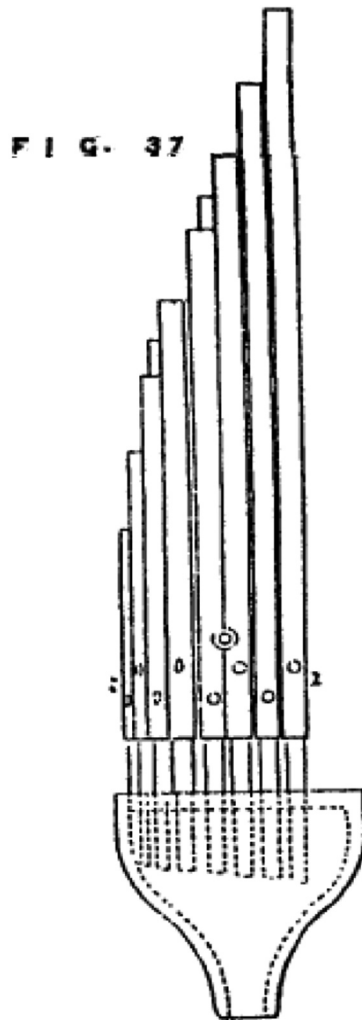


Figure 4. Detail from Wheatstone's patent.

European in some fashion. Moreover, the instrument making community would have almost certainly known of the writings of scientists such as Chladni and Wheatstone, who were both instrument designers and leading authorities on acoustics.

There were other motivations for nineteenth-century musicians to distance free reeds from East Asia. For one, the fascination with Chinese music so characteristic of the late Enlightenment gave way in the first few decades of the nineteenth century to increasingly critical and racially inflected views. From the 1790s onward, writers singled out the sheng for praise within a generally sceptical view of the capacity of Europeans ever to enjoy Chinese music.¹² For example, in his essay on Chinese music for Rees's *Cyclopaedia*, written in the late eighteenth century but published in 1819, Charles Burney described the sheng as "more sweet and delicate than of any of our wind instruments" (1819, n.p.) but deemed it the only Chinese instrument "which would please European ears" (1819, n.p.).¹³ In 1793, Johann Christian Hüttner, a German physician attached to the British

embassy to China led by Lord Macartney, was transfixed by the sounds of combined sheng and string instruments, again stressing that this was an exception to his experience with Chinese music in general (Hüttner 1797, 179–180). Sir John Barrow, comptroller of the Macartney embassy, was even more critical, observing that while the sheng's "tones are far from being disagreeable", he "knew of no Chinese instrument that is even tolerable to an European ear" (1804, 314, 315)

Over the next few decades, as ideas about national music combined with emerging notions of racial difference in the light of changing geopolitical contexts, Chinese instruments began to be indiscriminately depicted as harsh and noisy. By the 1830s, we find frequent wholesale dismissals along the lines of the claim in the *Encyclopédie des gens du monde* that "all musical instruments of the Chinese (whether string, wind, or percussion instruments) have a sound meagre, screaming and harsh" (*Encyclopédie* 1835, 729 translated and cited by; Lehner 2011, 345). In an ironic counterpoint to the appropriation of free reeds by the West, it appears that the growing popularity of the technology brought about not a rapprochement with East Asian music but, if anything, a desire for greater distance. It stands to reason, therefore, that instrument makers eager to market their latest invention might try to avoid any kind of oriental connotation.

An additional factor connects the portrayal of Chinese music as fundamentally discordant with the desire to reconfigure free reeds as European: the notion that certain kinds of timbres might generate potentially harmful effects on the nervous system. Unlike the prosaic scientific attitude towards the sheng exhibited by Chladni or Wheatstone, who focused on the material action of a vibrating tongue encased within a pipe, a more general audience frequently approached these novel timbres from the perspective of the early Romantic soundscape, in which the tones of certain instruments had the capacity to induce harmful physical effects through the sympathetic action of their vibrations upon the nervous system (Kennaway 2012).

Although the idea that sounds could be dangerous goes back at least as far as Plato's *Republic*, the threats posed by timbre, rather than mode or genre, took on unprecedented importance around the turn of the nineteenth century. As scholars including Heather Hadlock and James Kennaway have noted, much of this discourse originated around the allegedly pathogenic tones of the glass harmonica invented by Benjamin Franklin in 1761 (Hadlock 2000). The harmonica's link with madness was strengthened by the fact that a number of performers on the instrument fell prey to various mental and physical afflictions (Hadlock 2000, 525). Ideas about the ethereal vibrations generated by the glass harmonica were swiftly elided with contemporaneous notions of the sympathetically resonating nervous system, bringing about new anxieties about the potentially destabilising power of timbres to affect the mind and body.

We can draw a direct correlation between suppressed fears about the power of novel foreign timbres over European subjects and a broader social desire to convert the anxieties aroused by this new and exotic instrumental technology into a powerful but more familiar sonic imaginary. The sounds of Chinese music, regarded as fundamentally intolerable to Western ears, could not serve as an advantageous reference point for instrument designers interested in incorporating free reeds into fraught spaces such as churches and domestic parlours. Music critics likewise needed a way to reconfigure the technology around a different, but equally evocative category of sounds that were perceived as unfamiliar

yet benign. Fortunately, a whole class of such sounds was readily available: the undetermined and often metaphorical tones produced by the Aeolian harp.

From pipes to strings

The Aeolian harp, a wire-strung instrument (typically a simple sounding box) that resonates passively with the wind, was at once an actual physical instrument and a pervasive symbol for subjectivity in the Romantic era (see Abrams 1953). First discussed by Athanasius Kircher in the *Musurgia universalis* (1650) and popularised in the second half of the eighteenth century, this relatively new instrument – paradigmatically a “sonic thing” for its marriage of material and metaphor – appeared in Europe at almost exactly the same time as the sheng.

From its very inception, the Aeolian harp was depicted as capable of emitting both familiar and eerie tones – Kircher reported hearing “birdsong, a water organ, pipes, and various other sounds” (1650, 2.9:353). His conception of the Aeolian harp as unencumbered by a distinct sonic identity remained consistent throughout the following century. In 1792, for example, German physicist Georg Christoph Lichtenberg published an essay entitled “Von der Aeolus-Harfe”, describing the instrument’s sonic qualities as “a manifold of enchanting sounds, which surpasses description ... more like the harmonic play of ethereal beings than a work of human art” (1792, 142–143). A few years later, Christian Friedrich Quandt provided an influential 1795 account of experiments on the Aeolian harp, noting that the instrument’s “enchanting” tones alternately evoked the sonorities of an “organ, a harmonica, violin, flute, distant singing, or the arpeggio of a harp” (1795, 279). An anonymous early nineteenth-century British writer praised the very “indistinctness of sound of this delightful piece of mechanism, [which] favours every train of thought, it recalls to memory different styles of music” (Second Evening’s Amusement 1823, 17).

In addition to its indistinct tones, the Aeolian harp’s other predominant sonic characteristic was the ability of its strings to blossom slowly into sound in response to the wind. According to the Welsh cleric William Jones, the instrument sounded like a “chorus of voices at a distance, with all the expressions of the forte, the piano, and the swell” (Jones 1801, 74), an association shared with Lichtenberg, who noted that the instrument’s sounds reminded him of “the softly swelling and gradually dying song of a distant choir” (Lichtenberg 1792, 143). The swelling was immortalised by Samuel Taylor Coleridge in his famous poem “The Eolian Harp” (1795) – “the long sequacious notes/Over delicious surges/sink and rise” (1849, 38) – as well as in musical depictions of the Aeolian harp by composers including Beethoven, Knecht, and Berlioz (see Raz 2014, 129–134).

As the popularity of Aeolian harps increased and they began to feature in domestic and public spaces ranging from windows to gardens and parks, the image of strings coaxed into sound solely in response to nature was widely adopted by poets, philosophers, and physicians to model diverse psychological properties ranging from memory to sensation and sensibility (see Trower 2012, 13–36). This development was facilitated in part by the influence of pioneering approaches to the study of nervous transmission – in particular the rise of vibrating nerve theory as proposed by the British philosopher and physician David Hartley in 1749 as well as the Swiss naturalist Charles Bonnet in 1755 – on the rise of the new Romantic aesthetics of the self as antirationalist, prey to sublime or mystical forces and affects (see Raz 2014, 115–134).

The earliest reports of the tones produced by new free-reed instruments suggest that they were heard by early nineteenth-century Europeans in terms of two specific properties that were closely associated with the Aeolian harp: mutable timbres and a gradual swell and fade. Examples of the former can be seen in comparisons of the sounds of free-reed instruments to assorted extant instruments. Thus, in 1820, a contributor to the *Allgemeine musikalische Zeitung* likened the aeolodicon's tone to "a sweet mix of clarinets, bassoons, and other instruments" (Nachrichten 1820). A contemporaneous French review of Schortmann's aeoline observed that the instrument's pianissimo "perfectly resembles the Aeolian harp, and it is described as imitating the harmonica, clarinet, horn, hautboy, and violin, with much exactness" (Découvertes nouvelles 1820, 159), while a British report on the seraphine claimed that it could replace the flute, oboe, clarinet, bassoon, or cello (The Seraphine 1831, 319). It should be emphasised that all these descriptions predate the addition of instrumental stops to harmoniums by at least a decade, so these different timbres were all supposedly emerging from a single rank of free reeds.

In addition to the harmonium's unfamiliar timbres, the fact that free reeds afforded a gentle and controlled crescendo and decrescendo as the enclosed reed began to vibrate reminded contemporary listeners of the other predominant characteristic of the Aeolian harp: its wind-induced slow rise and fade. This gradual swelling was precisely the expressive capacity so famously afforded by Grenié's *orgue expressif* and prized by subsequent harmonium inventors. For example, music critic Thomas Busby asserted that the aeolodicon evoked "the imagined music of the spheres" and remarked on its "breathing sounds, swelled and softened at pleasure" (1825, 70). An aeolina invented by the aforementioned Wheatstone was likewise praised for its "exulting swells and dying cadences, which realized the poetical descriptions of the Harp of Aeolus" (The Aeolina 1729, 317).

Seeing a market opportunity in these poetic overtones, instrument manufacturers in Britain, France, and Germany began advertising their wind-operated keyboard instruments as realisations of the Aeolian ideal. These intentions can be discerned in the names of many early harmonium models, which frequently incorporated terms referring to Aeolus, god of the winds, as well as other heavenly associations. As the English essayist George Dodd would later swoon, "Aeolophon, Aeolodicon, Aeolharmonica, Melodium, Melodion, Aeolomusicon; what liquid sweetness of names!" (1853, 402).

These celestial connotations were also reflected in notions that the instrument could depict metaphysical subjectivity. In 1824, the instrument builder Johann H. Kaufmann published a sonnet to the aeolodicon, in which he described the instrument's timbre as "mit Geisterlispel – Himmels-Melodien" (with spirits' lisping – heavenly melodies) (1824, 379), apparently a reference Goethe's famous description of the Aeolian harp in the last stanza of the "Dedication" of *Faust*: "And grasps me now a long-unwonted yearning/For that serene and solemn Spirit-Land:/My [lisping] song, to faint Aeolian murmurs turning,/Sways like a harp-string by the breezes fanned."¹⁴ Related ideas soon appeared in contemporaneous medical texts, with physicians including Jacques-Joseph Moreau and Franciscus Hofgartner noting that the sounds of the harmonium exerted a particular power over their patients (Moreau 1845, 425; Hofgartner 1847, 35). As I have shown elsewhere, moreover, the "ethereal" tones of the harmoniums were soon employed to treat young women suffering from hysteria, though with mixed success.¹⁵

It may be no coincidence that explicit links between the harmonium and the imagery of the Aeolian harp began in German-speaking lands, where there seems to have been a greater awareness of the Chinese origins of free reeds. That is to say, we can contrast the names bestowed by Germanophone instrument makers on their products – such as Eschenbach’s *clavaeoline*, Schlimbach’s *aeoline*, Voit’s *aeolodicon*, or Brummer’s *aeolmelodicon* – with the strategy chosen by French instrument makers, who designated their inventions in a more pedestrian, descriptive fashion (such as Grenié’s *orgue expressif*). The link between the Aeolian harp and free reeds in German-speaking lands suggests that these audiences may have retained an attenuated sense of the free reed’s foreign origins. At the same time, free-reed instruments were explicitly coded as East Asian only rarely: it is telling that Mehwald’s *Neue Tschiang* swiftly faded from view, whereas the various Aeolian-themed instruments devised by his compatriots sustained a far greater hold upon the collective Romantic imagination.

Foreign encounters at home

The alignment of free reeds with the Aeolian harp accomplished more than drawing attention to a related mode of wind-induced sound generation. It may be that the implicit assimilation of the tones produced by a Chinese instrument to sounds associated in the West with the impersonal breath of nature had the effect of licensing European instrument designers to expropriate the free-reed technology without giving due credit to its true inventors.¹⁶ This interpretation sheds light on the surprising sense of violence in at least one account of the invention of free-reed instruments. The instrument designer Johann Gleichmann relates the history of Eschenbach’s creation of the *aeoline* as follows:

As in the invention of a number of other instruments, here too the Aeolian harp provided the initial inspiration. Mr. Eschenbach gave thought to the means by which the harmonies of this instrument, enticing yet reliant on the uncertain play of the winds and utterly undisciplined, could be made to submit to the laws of our tonal system, and subjected to the force of the fingers. (Gleichmann 1820, 508)

Gleichmann here compares the randomly generated sounds of the wind harp to alluring yet uncivilised subjects who were to be forcefully brought under European laws and coerced to follow the will of their masters. The tones of the free-reed instruments, based on a technology borrowed from non-Westerners, are thus strikingly likened to the wild harmonies produced by the winds activating random partials on the strings of the Aeolian harp.

My interpretation helps clarify another striking twist in the British reception of free reeds. In the period of increasing Anglo-Chinese hostility leading up to the first opium war of 1839–42, some writers appear to have been troubled by the notion that sounds so popular in Europe could possibly have originated in Asia. Thus, in his 1830 *Sketches from China*, William Wightman Wood portrays Chinese music as “a mass of detestable discord” and, rather than calling the sheng by its name, describes it as “a species of harmonica” (Wood 1830, 156). Even more remarkably, in his 1841 book *The Chinese as They Are: Their Moral, Social, and Literary Character*, the British missionary George Tradescant Lay decided to rename the sheng “Jubal’s Organ”, identifying it with the biblical organ invoked in

Genesis. Lay then calls upon the language of foetal development to reduce one sophisticated musical technology to a primitive attempt at another, proclaiming that the sheng was not the progenitor of the free-reed instrument family, but “the embryo of our multifiform and magnificent organ” (1841, 88).

Finally, my account helps explain the selection of the harmonium as a signifier of exotic substance-induced transgression in literary sources. I will only briefly mention two examples here. In “Le Dôme des Invalides”, a short story written in 1832, Balzac depicts a hallucination caused by the physharmonica, an early harmonium developed by Anton Häckel in Vienna. The narrator reports that, after drinking excessively at lunch, he was subjected to a house concert at the home of a German friend, Baron de Werther. The performer

drew from a German instrument sounds that struck the perfect balance between the lugubrious tones of a tomcat soliciting a companion or dreaming of the joys of the gutter, and the notes of an organ vibrating in a church. – I do not know what he did with this terrible engine of melancholy, but my mind had never been more cruelly rattled. The puff of air, channeled into metal pipes, produced harmonic vibrations so strong, so deep, so piercing, that each note immediately attacked a fiber, and this verdigris music, these melodies full of arsenic, violently introduced into my soul all the reveries of Jean-Paul, all the German ballads, a fantastical and painful poetry that made me want to flee. (Balzac 1832, 260–261)

Our narrator soon finds himself in the throes of a musically induced hallucination. He imagines that he is promenading about the Parisian streets alongside the dome itself, which is upended so that it ambulates on its tip. The protagonist concludes that he must have the newfound ability to befriend architectural monuments, and begins to plan how he might take the dome on a world tour. Suddenly, he is doused with cold water by a passing cab driving through a puddle, whereupon he wakes up and realises that he was actually viewing a reflection of the dome in rainwater that had collected in the street. The story ends with the exclamation, “Cursed physharmonica! It plays upon the nerves!” (Balzac 1832, 267).

Balzac here links the specific timbre of the physharmonica to the absurdity of the narrator’s delirious trance. The instrument’s sounds generate a bizarre form of synaesthesia tinged by German Romanticism, as these explicitly foreign vibrations lull our protagonist into an entranced, dreamlike state. Balzac’s decision to illustrate the dramatic effects of an Austrian physharmonica, rather than the local *orgue expressif*, may suggest an awareness of the contested French or German nature of free reeds and, at a deeper level, the free reed’s association with pathological and exotic effects.

The link between free reeds and mind-altering substances also appears in a short story by Thomas Hood, “Hayder’s Emerald Cup” of 1843. Here, too, the narrator encounters a foreigner, an unidentified Arab with a perfect command of English, who is both an excellent organist and a magician specialising in “Egyptian ocular deceptions” (Hood 1843, 221). The protagonist invites the Arab into his home, whereupon he performs various magic tricks, offers his host an unidentified green drug, and proposes that the two of them set out on a trip to the East, which is colourfully described. Suddenly, the narrator awakens and realises that he has been hallucinating:

I looked around me, on the carpet were the broken pieces of my pipe, and close beside my chair the seraphine was placed. The music desk was covered by a leaf of vellum

curiously indented and illuminated with great care and skill. It contained a few bars of a common simple melody beautifully harmonized.... I had been dreaming with eyes but half closed; hearing through what would scarcely bear the name of sleep, the conversation of the stranger, and the tones of the seraphine, and seeing indistinctly the objects I have mentioned, while under the influence of a wonder-working, but to me unknown narcotic. (Hood 1843, 225)

Balzac's vignette and Hood's short story show striking parallels. In both accounts, the narrator is first incapacitated through the consumption of mind-altering substances and then penetrated by sounds produced by another man marked by national difference. This violation gives rise to a state of delirium with a decidedly exotic flavour, involving world tours and trips to the East. Regardless of the extent to which Balzac, Hood, or their readers were aware of the Chinese origins of free reeds, these stories indicate that the harmonium continued to be coded as foreign well into the early 1840s.

Free reeds in Europe and beyond

To summarise, the genealogy of the European reception of free reeds traced here represents a multifaceted case of cultural appropriation, in which the Chinese heritage of free reeds was erased for multiple reasons and in multiple contexts. From the very outset, the technology was detached from its East Asian setting and claimed by various instrument designers battling for the inventor's primacy. Their efforts were facilitated by other, unrelated trends, including ongoing nationalist debates between France and Germany, prosaic concerns around the marketing of musical instruments, the contemporary fascination with the physiological effects of timbre, and the attraction of the Aeolian harp both as an instrument and as a central cultural metaphor. Over the next few decades, even as knowledge about the Chinese origins of free reeds continued to circulate in scientific contexts, instrument builders and music critics consistently downplayed this fact in favour of enthusiastic comparisons with the Aeolian harp.

A confluence of vastly differing agendas contributed to obscuring the origins of the free reeds in the sheng; we cannot pinpoint a single actor, community, or moment in which a coherent decision was taken to Westernise the technology. It is clear, however, that changing political and racial contexts – most notably after 1830 – affected the ways in which the sounds of the reeds were both perceived and understood.¹⁷ This shift is evident in the growing European distaste for the timbre of the sheng, ironically at the same time that its technology was being widely disseminated by new harmonium and accordion instruments. It is also evident in the revised histories of the technology put forth by various writers on Chinese music, as well as in the fictional association of free reeds with narcotic substances and a vaguely threatening exoticism. The unlikely global career of free reeds thus exemplifies the familiar orientalist tendency both to fear and to fetishise Chinese culture, a dynamic amplified by contemporaneous European beliefs about the power of sound, and novel timbres in particular, upon the mind and body.¹⁸

As a final example, let us consider another step along the free reeds' international trajectory, namely the incorporation of the hand-pumped portable harmonium into Indian music in the 1870s. As Matt Rahaim has expertly demonstrated, this instrument's

subsequent rejection during the Indian independence movement was attributed to the rigidity and foreignness of its scale (distinctions at once highly artificial and contingent, as Indian and European music both include contiguous and discrete instruments and modes of playing) (Rahaim 2011, 658–659). Although the harmonium remains very popular in the subcontinent, its status is fraught to this day. Rahaim observes that, curiously, in transnational contexts that do not involve the West – most notably the Indian community in Afghanistan – the very same properties that condemn the instrument as European in India become heard as paradigmatically Indian (2011., 660).

Understanding the different factors that contributed to the absorption of free reeds in the West, as well as to the technology's postcolonial afterlives, can help us understand the conditions under which sonic things are assimilated or rejected in changing cultural settings. The nature of sound technologies and their participation in complex social and cultural networks of meaning ensures that their transmission always entails the creation of new auditory cultures. It is this very feature that enabled free reeds to sound sweet or discordant, pipe-like or harp-like, celestial or toxic, German or French, British or Indian, at different moments and stations in their circulation.

Notes

1. On the topic of music-historical orientalism see Rehding (2014).
2. See, e.g. Davies (2016); Pasler (2004); van Rij (2018).
3. See Ahrens (2002, 34). Both Mersenne and Blanchini believed the instrument required a windbag in order to produce sound. Mersenne writes that he was sent a figure of the instrument from the "rare cabinet [of curiosities] of Mr. Claude Menetrier by Mr. Jean Baptiste Dony, gentleman and Secretary to the Most Eminent Cardinal Barberini" but never saw or heard the instrument performed. He notes that specific questions regarding the instrument's workings could likely be easily answered by a visit to the cabinet, a comment suggesting that he himself had not done so. In contrast, Blanchini claims that he saw the instrument performed by a Chinese man named Cinfochus in Rome in 1685; however, we know of no Chinese windbag-operated sheng or other instrument answering to the description in his book. Unlike both of these writers, Bonanni appears to have thought that the pipes themselves were fingered like flutes. See Mersenne (1637, 308); Blanchini (1742, 23); Bonanni (1722, 171, plate 138). I thank David E. Cohen for his help with the Latin texts.
4. "Die liebliche Chinesische Orgel" (von Stählin 1770, 192). Here and throughout, all translations are my own unless otherwise attributed.
5. de la Borde (1780). The reliability of these three sources is distinct: Amiot would have certainly had access to instrument makers and performers during his prolonged residency in China, while von Stählin may have been reporting on his own experiences in listening to the instrument in Russia. In contrast, de la Borde, who was primarily a composer of French opera music, seems to have based his account on Amiot's writings.
6. Wilke also references the rival claims of the organ builders Uthe and Strohmann, which had been published in the *AMZ* itself in 1811. See Strohmann (1811).
7. Hilariously, Weber complains, "An invention originally made by a German and executed by more Germans, though, to be sure, never grandly trumpeted, was reinvented several decades later by a Frenchman and now – how righteously! – acclaimed by French and Germans alike as a 'French invention'" (Weber 1822, 345). Parts of the entry, including this titbit, were reprinted in Gottfried Weber's introduction to Wilhelm Weber's essay "Compensation der Orgelpfeifen" (Weber 1829).

8. Praetorius mentions a curious set of pipes of an organ in a monastery in Hessen, but his description of its pipes is quite distant from contemporaneous notions of free reeds: “In a monastery in Hessen, a peculiar kind of trombone has been found, in which a brass plate is soldered onto the mouthpiece with a rather elongated little hole in the middle; the real reed is only laid above that and fastened on with annealed wires so that it cannot drone or whine too much” (Praetorius 1618, 143).
9. Moreover, Fétis claimed, “the records of the meetings of the teaching committee of the Paris Conservatoire... prove that twelve years before the public debut of his *orgue expressif*, that is, in January 1798, Grenié had already been conducting comparative tests between pipes and free reeds” (Fétis 1837, 406).
10. Fétis corrected this omission in the 1862 edition of the *Biographie universelle*, which describes the sheng and credits the Chinese (Fétis 1862, 100).
11. A comparison published in 1877 put the Paris harmonium industry at half the value of the piano industry, and more than the wind, wood, metal, and bowed instrument industries combined (Notes 1877, 90). Similar trends can be seen in a report on the British market in the catalogue of the *Exposition Universelle* of 1867, where with the exception of the piano and the organ industry, harmonium builders were more numerous than any other instrument manufacturers (Notes 1877, 60).
12. I draw primarily on English-language sources, given the dominance of the British navy at the turn of the century and its political intentions towards China. These writings circulated throughout Europe and were widely excerpted and translated. As late as 1841, for example, Heinrich Ritter von Levitschnigg relied on reports from the Macartney Embassy and on James Johnson’s travelogue, *An Account of a Voyage to India, China... performed in the years 1803–4–5* (1806), in order to compile his essay on sounds from China (Ritter von Levitschnigg 1841).
13. In preparing his article, Burney corresponded with Scottish physician James Lind, who had spent time in Canton, and with Matthew Raper, a British trader who lived there; Raper even arranged for a collection of instruments (including a sheng) to be sent to Burney from Canton. See Irvine (2019).
14. “Und mich ergreift ein längst entwöhntes Sehnen/Nach jenem stillen, ernsten Geisterreich,/Es schwebet nun in unbestimmten Tönen/Mein lispelnd Lied, der Äolsharfe gleich” (Goethe [1808] 1870, 6).
15. See Raz (2014); Raz (2019); Raz and Finger (2018).
16. This interpretation is bolstered by the context of the first Western account of the sheng in Mersenne’s aforementioned *Harmonie Universelle*. The first paragraph of Book 5 Prop. 35, subtitled “To Explain all the other Instruments that use Wind to produce Sound, and especially those of India”, begins with accounts of “various caverns, recesses, and other underground places which sometimes make harmonious sounds” before continuing to discuss the sheng.
17. On the profound change in European attitudes to Asia at this time see Osterhammel (2018, 27–29).
18. See, of course, Said (1978).

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