

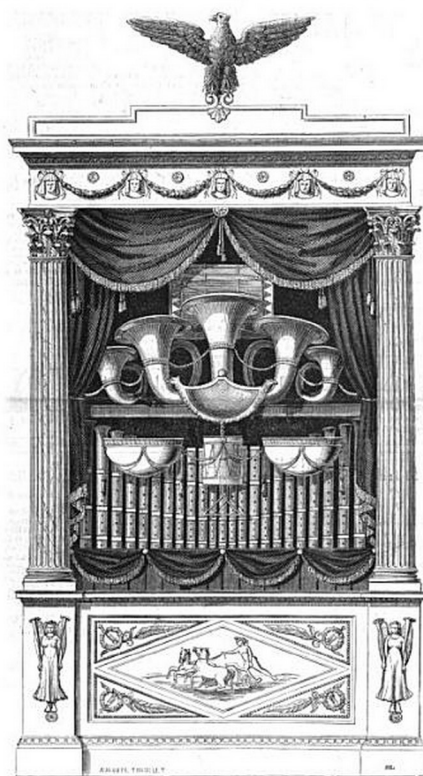


Up until the early 1890s, there was only one way to listen to music other than in live performance: through the operation of an automated musical instrument, notably a barrel organ or an orchestrion.

Barrel organs had been in use across Europe since the early 1700s. They were not only played in the streets and on fairgrounds, but especially in France and England also in churches and at salons. The underlying technical concept was already described in 1650 by Athanasius Kircher, a German Jesuit scholar who investigated and published on a broad range of subjects, in his book *Musurgia Universalis*, and can be traced back further to the Banū Mūsā brothers, three inventors of Persian descent, who described it in their *Book of Ingenious Devices*, published in the year 850 in Baghdad.

In a standard pipe organ, the pipe through which air is blown to sound a specific note is selected by the player by pressing a key. The keys operate valves to which the pipes are connected. In a barrel organ, these valves are operated by a mechanism driven by a barrel, on which the notes to be played are encoded by pins and staples. As the barrel slowly rotates, the pins and staples open and close the valves regulating the airflow to the pipes, and thus produce a tune. The same principle of encoding music on a revolving cylinder (or disc) is also found in musical clocks, which can be traced back to the early 1600s in Augsburg, Germany, in some carillions, and in musical boxes.

While barrel organs are typically compact enough to be easily transportable, larger versions also exist that are either stationary or movable only with considerable effort. These so-



Mälzel's *Panharmonicon*
(illustration from 1846)

called orchestrions typically aim to reproduce the sound of an entire orchestra or band, including wind, string and percussion instruments. The earliest of these complex mechanisms was the *panharmonicon*, realised in 1805 by Johann Nepomuk Mälzel, a German engineer and showman, who found lasting fame as the inventor of the metronome. In 1813, Mälzel's friend, Ludwig van Beethoven, wrote his "battle symphony" *Wellingtons Sieg (Wellington's Victory)* expressly for the panharmonicon.

While panharmonicons and the more sophisticated orchestrions that succeeded them could reproduce an impressive range of instruments, like the simpler barrel organs, they all had major limitations: Programming them, by means of pinning the cylinders on which the music was encoded, or later by preparing the perforated music rolls that served the same purpose, was a labour-intensive endeavour requiring considerable skill and patience. Furthermore, the music they could produce was determined by the fully mechanised instruments built into them and their narrow expressive capabilities, excluding, for example, the human voice.



That all changed on 29 November 1877, when Thomas Edison demonstrated a device he called the *phonograph*, which was capable of recording and playing back any sound – including speech, the singing voice and arbitrary musical instruments. His invention was based on the idea of mechanically transcribing the vibrations of air the ear registers as sound in the form of grooves engraved into the surface of a rotating cylinder. To play back the sound thus recorded, a stylus mechanically transferred the variations in the depth of the groove back into the vibrations of an acoustic membrane.

Early models of Edison's phonograph had several shortcomings: Not only was the reproduction of sound heavily distorted, but the recordings were quickly degraded by the mechanical stress of the playback process and became useless after having been played back only a few times. Still, Edison had discovered the principle of recording and reproducing any kind of sound and music.



Thomas Edison with an early version of his phonograph (1878)

Unbeknownst to Edison, he was not the first to have made that discovery. Seven months before Edison's demonstration Charles Cros, a French poet and inventor, had described the same basic idea in a sealed letter he deposited on 30 April 1877 with the *Académie des sciences* in Paris, a common practice at the time to establish claims regarding the date of conception of unpublished ideas and discoveries. Cros never built his invention, which he called the *paléophone*, but the method he had envisioned for etching a recording groove into a metal surface would be used more than a decade later for the production of disc records.



Intrigued by Edison's phonograph, Alexander Graham Bell (who just a few years earlier, in 1876, had patented the first practical telephone) and his associates at the Volta Laboratory in Washington, DC, set out to improve the quality and durability of sound recordings. After several years of experimentation, a solution was found by engraving the recording groove into wax, rather than by indenting tin foil, as in Edison's first device. This method extended the useful life of recordings to several dozen playback cycles; it was soon also adopted by Edison and quickly paved the way for commercial applications.

On 29 June 1888, one of the first recordings of a public concert was made in the Crystal Palace in London, during a performance of Händel's oratorio *Israel in Egypt*. Meanwhile, the commercialisation of the devices developed by the Volta Laboratory and by Edison, respectively, had kicked into high gear. Sadly, Charles Cros, who had first conceived the underlying principle, would not be able to witness the birth of the industry that was now quickly taking shape, since he died at the age of 45, in early August 1888.

Over the decade that followed, pre-recorded cylinders with professionally recorded music became widely available. Initially, these were mostly used in "nickel-in-the-slot" machines installed in taverns and arcades, but soon after, phonographs made their way into upper-class homes. This development was greatly facilitated by a standard cylinder format agreed upon by several companies manufacturing phonograph equipment, notably including Edison Records and Columbia Records, who produced and sold recordings. As demand for certain recordings increased, some artists had to go through hundreds, and sometimes thousands of recording sessions of the same song, so that a sufficient number of cylinders could be made.

All this changed in 1900, when Thomas Lambert was granted a patent for the mass production of cylinder records made from celluloid. These cylinders could be played back thousands of times, and more importantly, they could be copied in large numbers by pressing blank cylinders into metal moulds produced from a master recording, using steam – a process that took just under seven minutes per record.



However, in terms of truly bringing recorded music to the masses, cylinders would soon become superseded by another format: the gramophone record. In 1887, while Fritz Delius was studying in Leipzig, Emile Berliner, who had emigrated from Germany to the United States of America in 1870, at the age of 19, registered a patent describing a new system for recording and playing back records. Berliner's invention was inspired by the original concept of Charles Cros and the ambition to cheaply and easily produce and distribute large numbers of records. It was based on the idea of cutting a spiral groove into a disc, with lateral deviations for encoding the sound waves rather than the variation in depth used by Edison's phonograph. Copies of the disc record could be made rather easily by stamping, moulding or an electrochemical process known as electrotyping.

While the phonograph was designed to record and play back sound and music, the idea behind Berliner's gramophone was to make playback devices and records widely available, but to limit the production of records to sophisticated and professional environments, requiring more complex processes and machinery. This concept of professionally pro-

ducing recordings for a mass market turned out to be wildly successful.

By 1890, Berliner had first prototypes of the gramophone manufactured in Germany and distributed within Europe. Initially, the disc records were made from hard rubber, with a diameter of 12.5 centimetres and only one side being used for sound reproduction. Before long, shellac was used as the principal material for making records, both sides were used, and the diameter was increased to 17.5 centimetres.

In 1893, Emile Berliner founded the United States Gramophone Company, followed by the Berliner Gramophone Company in 1895, the UK Gramophone Company in 1897, the Deutsche Grammophon-Gesellschaft in 1898 and the Berliner Gram-o-phone Company of Canada in 1899. These companies not only manufactured and distributed gramophones, but also produced and manufactured the records to be played on them, and thus began working closely with musicians.

Soon, Berliner's success prompted others to copy and improve upon his designs and processes. One of these was Eldridge R. Johnson, who was initially contracted by Berliner to improve the drive mechanism for the gramophone and then produced the new, spring-driven motors. However, when Johnson started producing not only an improved version of the gramophone, but also his own records, a drawn-out legal battle with Berliner and his associates ensued. Ultimately, in 1901, Berliner and Johnson agreed to end the dispute and founded the Victor Talking Machine Company, headquartered in Camden, New Jersey, and led by Eldridge Johnson.





His Master's Voice, logo of the
Victor Talking Machine Company,
painting by Francis Barraud (ca. 1898)

In late June 1920, the National Association of Talking Machine Jobbers, the trade organisation of the American phonograph and gramophone industry, held its annual convention in Atlantic City, at the Hotel Traymore. As it happened, the director of the recording department at the Victor Talking Machine Company, Calvin Child, had lunch at the nearby Ambassador Hotel and there heard Paul Whiteman and his dance orchestra play. Child, a recording engineer who was also responsible for the recruitment of artists and the overall repertoire recorded by Victor, immediately realised that what he heard was new and exciting. These were arrangements unlike any he'd come across before, played with verve and precision by an ensemble larger than usual for a dance orchestra. After the set, Child approached Whiteman, introduced himself, complimented him on the performance, and made him an offer.

This was it! Paul Whiteman realised immediately that here was the chance of a lifetime. Things at the Ambassador were going well, but this was an entirely different ball game. Records were the rage, and success in that business would mean an audience of tens of thousands for their music, name recognition across the nation, and more opportunities for live performances than he and his lads could ever make good on.

A few weeks later, Whiteman and his band moved north, and on 9 August, they had their first recording session at the headquarters of the Victor Talking Machine Company in Camden, New Jersey, just across the Delaware River from Philadelphia. They played four songs that day, *The Japanese sandman*, *Avalon*, *Wang-wang blues*, and *Whispering*. Formally, the session was arranged as a trial, but Calvin Child knew that the deal was done, and that Whiteman and his orchestra



Label of the first disk record of
Whispering (1920)

would be signed on and produced. Actually, take 2 of *Wang-wang blues* was plenty good for a release.

It only took two more recording sessions, on 19 and 23 August 1920, to get another five songs ready for release. These first recordings of "Paul Whiteman and His Ambassador Orchestra", as the ensemble was now called, were released between November and December 1920, in the form of three double-sided disc records under the Victor label. All but one of the six songs had been arranged by Ferdie Grofé.

But this was just the beginning: Paul Whiteman had signed a lucrative exclusive contract with Victor, and thus, the foundation was laid for what would turn out to be an enormously success for the company as well as for Whiteman and his musicians. Over the five years that followed, *Whispering/The Japanese sandman* (Victor 18690) became the first record ever to sell over a million copies, wildly exceeding anyone's expectation.



In September 1920, Paul Whiteman and his band moved to New York City, where they would play most nights over the following four years at the Palais Royal on Broadway. A month later, alto saxophone and clarinet player, Gussie Mueller, decided to leave the ensemble, since he found its carefully arranged and orchestrated style of music overly restrictive. To replace him, Ross Gorman joined the band.

Gorman was, by all counts, a gifted reed player. In addition to different sizes of saxophones, he played the bagpipe, the oboe and the octavin, a rare single-reed instrument made from wood, with a cylindrical bore, folded like that of a bassoon. But above all, Ross Gorman was a veritable virtuoso on the clarinet.

One year earlier, in September 1919, he had helped the Columbia Phonograph Company – a competitor of the Victor Talking Machine Company - launch its foray into jazz, with a song called *Barkin' Dog* that contained some of the most improbable sounds a clarinet could produce.

Paul Whiteman's approach was considerably more restrained, but Gorman recognised the opportunity that joining his orchestra offered. In late November 1920, he took part in their recording sessions for the Victor label, playing the alto saxophone in *Just snap your fingers at care*, as well as clarinet and flute in *Caresses*. It didn't take Ferdie Grofé long to take full advantage of Gorman's outstanding abilities in his arrangements. Before long, he also started involving Gorman in the process of preparing arrangements for the ensemble that was now quickly rising to international fame as the Paul Whiteman Orchestra.



The origins of jazz music are closely tied to the African-American population brought as slaves predominantly into the Southern United States. The musical culture Fritz Delius had experienced in 1884 and 1885, during his stay in Florida, was one of the ingredients to what was to become a major phenomenon across North America and beyond in the 1920s. These work songs and spirituals developed into the blues, a musical form that near the turn of the century could be heard broadly across the American South.

Different from most European-style music at the time, which was based on 7-tone major and minor scales as well as 12-tone chromatic scales, blues and other early forms of jazz music made extensive use of 5-tone scales, augmented with

so-called blue notes, which sound lower than one would expect. In fact, these notes would not be found on the keyboard of pianos tuned to the “well tempered” schemes that had become prevalent since the early 1700s.

Blues and the spiritual tradition it had grown from also exhibited another important characteristic: the use of improvisation, the spontaneous invention of melodic lines during a performance over a given harmonic scheme. In blues, improvisation would often be used to enrich the underlying call-and-response pattern, where the first line of a blues verse would be sung straight, followed by a somewhat embellished instrumental response (or ‘break’); the singer would then repeat the first line in a slightly varied way, followed by an improvised response picking up the mood. This style of improvisation would often involve changes in rhythm, adding or leaving out notes, and even melodic inversion, where rising lines are transformed into descending ones and vice versa.

Characteristic rhythms are at the core of ragtime, another genre of music that influenced early jazz. Like blues, ragtime originated in African-American communities. Based on march music, ragtime pieces (or *rags*) make heavy use of syncopated rhythms of African origin, which place melodic accents between regular beats. Ragtime pieces are often written for and performed on piano; they became popular towards the end of the 1890s, and some ragtime composers achieved considerable fame— chief among them Scott Joplin, the “King of Ragtime”. Like Frederick Delius, Joplin had contracted neurosyphilis; in his case, however, the infection eventually caused severe dementia. Soon after he died, in the Spring of 1917 at the age of 48, the popularity of his music faded, and ragtime gave way to jazz.

for recording sessions, where timing greatly mattered.

The style thus created came to be known as symphonic or orchestral jazz. By many, it was hailed as the transformation of jazz from mere folk music to an art form, while others were openly critical of the effort of “making a lady out of jazz” – especially since, in contrast to earlier styles, symphonic jazz would mostly be performed by ensembles of white musicians. In any case, to a large extent propelled by the recordings of Paul Whiteman and his orchestra, symphonic jazz became immensely popular.



Everyone sat at the ready. Ross was looking forward to this particular recording, as he knew were many of the others. This *Oriental Fox Trot* was quite the piece. From the first rehearsals, everyone had sensed that Ferdie and Paul had hit the ball out of the park with this number. Working into it the aria from *Samson and Delilah* had been a stroke of genius; but what made it even better was Ferdie’s idea to use the heckelphone for it. Yes, that was an outstanding fit, and Ross thoroughly enjoyed using his new instrument for this marvellous solo.

Now, the recording technician gave the sign, and Paul’s downbeat launched the intro. Nice and tight playing, Ross thought, as the saxophones and brass belted out the opening line over the even beat strummed by the banjo. Superb, how the celesta added an exotic sparkle to the regular beat that now stepped back to make room for the first solo, introducing the haunting melody of Cui’s *Orientale*. This worked really well on the tenor saxophone, and the way it was picked up by the soprano sax made it even better. Towards the end of the



Label of the first recording of
Oriental Fox Trot (1922)

phrase, the melody started to push against the rhythm, allowing it to break free of the regular beat. Yeah, that was it ... now back to the lower saxophone, which answered taking the same license ... and then again the soprano, falling back into the rhythm, as the accompaniment became more complex.

Ross loved this setting and breaking of expectations, this keeping the listeners on their toes. But now came the best bit, something no audience could possibly expect. The sound of the heckelphone still surprised him, but Ross loved playing this strange and wondrous instrument. *My heart at thy sweet voice* ... what a beautiful melody Saint-Saëns had conceived, and how intriguing it sounded when played on this most unusual instrument rather than sung by an operatic soprano! The way the muted cornet appeared to improvise around it made a great contrast, adding something playful and frivolous to the heartfelt tune. Marvellous, and so much fun to play! The

balance between the two instruments could be tweaked further, but of course this was only the first take ...



Uncharacteristically, the recording session on 23 May 1922 hadn't taken place at the Victor headquarters in Camden, but in New York. Paul Whiteman and his orchestra had done three takes of a piece that was quickly becoming one of their most popular, a unique version of César Cui's *Orientale*. Of course, the piece was very well known; in fact, more people would recognise the tune than had ever heard of the Russian composer who had written it, almost 30 years earlier, in 1893. Ferdie Grofé had arranged the number quite brilliantly in the style of a fox trot, and the result was very convincing, a nice addition to the band's steadily growing repertoire. But then, Paul Whiteman had an inspiration of the kind that seems to come from nowhere but changes everything: He realised that another famous tune could be inserted easily and very naturally into this '*Oriental Fox Trot*'.

Fifty-four years earlier, in 1868, Camille Saint-Saëns, by then already a well-established composer in his French fatherland, had written an aria, a duet, that would become one of small number of pieces defining the very concept of opera in France. Titled *Mon cœur s'ouvre à ta voix* (*Softly awakes my heart* or *My heart at thy sweet voice*), the aria comprises the key moment of the biblical story of Samson and Delilah, in which Delilah seduces Samson in order to learn the secret of his invincible strength and to rob him of his supernatural power.

Saint-Saëns had begun working on his grand opera, *Samson et Dalila*, a year earlier, but progress was slow, and when

he first presented an early version of the second act of the opera, including the aria, during a private soirée, it was received without much enthusiasm. It would take close to ten years for the opera to be completed and finally premiered, on 2 December 1877, in the Grand Ducal Theater of Weimar (Germany), thanks to strong support from Franz Liszt, after no opera house in France had shown interest. Although the première was a resounding success, it took another ten years before the opera started attracting broader attention. But then, beginning in the 1890s, the popularity of *Samson et Dalila* started to sky-rocket, and by 1906, more than 200 performances had taken place, firmly establishing the opera in the standard repertoire. At the same time, the aria, *Mon cœur s'ouvre à ta voix*, had become known far beyond the circles of classical music.

Integrating the melody of Saint Saëns's aria into the *Oriental Fox Trot* had been rather easy; the true stroke of genius had been to have it played by Ross Gorman on his latest acquisition, the heckelphone, and to add a seemingly improvised second melodic line, played by a muted cornet. From the moment the band started rehearsing the piece, Ferdie Grofé and Paul Whiteman realised they had a winner; when they first performed it in public, everyone knew it would become a hit.



Early styles of jazz made use of a small range of musical instruments. Pianos, of course, were found at many of the venues where jazz was played and could be easily used on their own. Brass instruments, notably the cornet, trumpet, trombone, but also the tuba, played an important role; since they were widely