

## (Re)constructing Early Recordings: a guide for historically-informed performance

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**Abstract:** In recent years, early recordings have become a primary source of musical research in multiple music disciplines. Such recordings, typically dating from the late 1800s through to the early 1900s, employed mechanical sound-reproduction technologies to capture performances by many of the leading figures of the time. As such, they offer valuable insights into the aesthetic tendencies and preoccupations of the late nineteenth and early twentieth century musicians, capturing and preserving performance styles, traditions and musical approaches of an age that has long-since passed. Unfortunately, very little research has been done into the production of such recordings and, as a result, we do not know to which extent musicians needed to adapt or change aspects of their performances when recording mechanically. This lack of knowledge has implications for any research that employs early recordings as a primary source within contemporary musical research. In response, this article introduces a Leverhulme-funded research project “(Re)constructing Early Recordings: a guide for historically-informed performance”. The first year of this project focuses on recordings on wax cylinders made by Julius Block, a music enthusiast and recording pioneer. Between 1889 and 1927, Block recorded some of the most eminent musicians and artists of his time, including Anton Arensky, Paul Pabst, Sergei Taneyev, Leo Conus, Jules Conus, and Anna Yesipova, among others. This article presents a case study based on the reconstruction and simulation of Block’s mechanical recording processes to capture performances using wax cylinders. Digital technologies were also used for the purpose of comparative analysis. Taken as a whole, the article serves to promote the use of early recordings, and proposes a method for their future analysis and use.

**Keywords:** Early Recordings; Reconstruction of Recording Processes; Wax Cylinders; Julius Block

Early recordings provide clear evidence of past performing practices. Such recordings, particularly those produced during the late nineteenth and early twenties centuries, enable us to hear some of the most significant performers of an age now passed; through such recordings, one may discover surprising ways in which performers approached the musical text, whilst encountering styles, traditions and aesthetic tendencies that differ, sometimes wildly, from our contemporary approaches to the same. For researchers of such practices, early recordings are invaluable; early recordings do not always correspond with their written counterparts and they often provide information about performance styles and techniques that is rarely discussed in written evidence. Early recordings are therefore a valuable form of primary evidence that allow performances of the past to be repeated and systematically studied using a wide range of different research methods.

Unfortunately, the use of early recordings in scholarly research is still relatively rare. Despite a number of excellent publications on the topic (Philip 1992; Philip 2004; Brown 1999; Day 2000; Milsom 2003; Peres Da Costa 2012) such recordings are often overlooked. This is, perhaps, because early recordings (as, indeed, all forms of evidence) have their limitations; as has been widely acknowledged, individual recordings do not merely offer a snapshot of an entire tradition. Rather, they evidence singular performances by individual musicians (or group of musicians). This becomes all the more significant when interpretative and improvisatory aspects are taken into account; notations and performance markings were frequently suggestive, rather than prescriptive, and as a result, recordings do not merely capture individual instances of performance, but individual interpretations (Butt 2002). This must be taken into account

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when such recordings are used in any given research context; despite the many things that one may learn from early recordings, they are a highly specific form of evidence that cannot be relied upon without additional supplementary evidence.

Alongside the specificity of early recordings, there are questions about the technologies involved; the performances heard on early recordings are necessarily and understandably conditioned by the recording machinery of their day, and this potentially limits their use within research contexts. This point has been raised by Richard Taruskin, who notes that recordings have an ambiguous relationship with performance, as the technologies involved and their potential influence upon the behaviour of the performer must be accommodated (Taruskin 1995). Furthermore, recording technologies are rarely transparent; durational limitations, the placement of the recording cones or microphones, the amount of surface and background noise, and the potential for multiple takes and re-takes are but a few of the many factors that potentially influenced the production of each recording.

Whilst questions about the specificity of recordings might be resolved, or at least understood, by reference to additional research sources, very little research has been undertaken into the production of early recordings. This makes it extremely difficult to assess the many factors that may, or may not, have influenced or otherwise affected performances that have been recorded. To this end, the author's Leverhulme-funded research project "(Re)constructing Early Recordings: a guide for historically-informed performance" involves a practical investigation into the recording methods of the past; early recording technologies are used to capture a range of recordings, in order that the specific affordances and constraints of such technologies might be fully understood in relation to the performances that they captured. The article presents a case study based on the first year of this project, involving the reconstruction and simulation of a mechanical recording process; a series of piano performances were recorded using wax cylinders. The case study considers interpretational changes which had to be undertaken in order to record the piano mechanically, whilst addressing some of the various factors impacting upon the recording process. Although only part of a larger investigation, the case study demonstrates some of the various ways in which mechanical recording processes were employed, and thus helps to explain some of the factors that need to be addressed when using early recordings as a form of evidence.

### **Case Study**

The wax cylinders I decided to recreate were originally made by Julius Block (1858-1934), a music enthusiast and recording pioneer. Between 1889 and 1927, Block recorded some of the most eminent musicians and artists. Born in Pietermaritzburg, Natal, in 1858, he had hopes for becoming a musician, but his father, a wealthy businessman who represented two American trading companies in Russia, insisted that he devoted his life to business. The companies flourished, and Block became a very wealthy man, selling first bicycles to Russia, together with sowing machines and various new innovations. Travelling for business, Block was in New York in 1889, when he found out about Edison's phonograph. He soon paid Edison a visit, and purchased a recording device. Starting from 1889, Block organised phonographic soirees where he recorded some of the most important musicians of his time, as well as artists and other important people - such as Tchaikovsky, Tolstoy, Rimsky Korsakov, and Anton Rubinstein. It is because of Block we can hear Josef Hofmann only a year after Rubinstein's death, Paul Pabst - Liszt's pupil who died in 1897, Arensky performing his own compositions, Lavrovskaya, Yesipova, Paul Pabst, 11 year old Jascha Heifetz, Nikitsch, and many many others. Block cylinders are the earliest surviving recordings ever made of music by Bach, Wagner, Chopin, Schumann, Donizetti, Bizet, Tchaikovsky, Verdi, and others. Importantly, these cylinders are the first systematic effort to preserve composer's

interpretations of his own works. He began this in 1892 and was years ahead of Gramophone Company's projects with Saint-Saëns and Grieg.

Even though Block received some training on the use of the phonograph from Edison's staff, he underwent through a long process of teaching himself how to record. As a result of this lengthy process, his cylinders vary in quality. During my own reconstruction process, all the cylinders were made by Duncan Miller, a recording technician specialising in mechanical recordings. I did not have any experience about the practicalities of the mechanical recording process, so this was a completely new experience for me; similar to the first recording artists, I had a very limited understanding of what I would hear back after recording. Individual performances were not only captured on wax cylinder; they were also recorded digitally, by Adam Stanovic, Senior Lecturer in Music Technology at The University of Sheffield. For reasons of duration, comparisons between the two recordings - mechanical and digital – is not discussed here, but offered in a separate article to be published in late 2018.

The piano, as an instrument, has undergone significant changes since the first sound recordings were made. The action on the pianos then was much lighter than nowadays and, in general, the instruments had distinctive tone colour. As a result, one does not play the instrument from the nineteenth century and contemporary piano in the same way, and the instrument itself offers different sonic result. With this in mind, it was important to choose an appropriate instrument for the reconstruction. Unfortunately, however, the instruments recorded by Block are unknown. Based on listening alone, it is more than possible likely that his wax cylinders were used to capture a range of different instruments. Since Block lived in Moscow until 1899, it is possible that he used a Russian instrument, such as Becker, Diedrichs, Schreder. He later moved to Germany and, afterwards, Switzerland, where he died in 1934. Around this time, a notable family would most likely have a German or French instrument, such as Pleyel, Blüthner or Bechstein.

I was unable to locate any of the popular Russian pianos of the nineteenth century. However, I was fortunate to find Besbrode Pianos, based in Leeds; this specialist store kindly offered one of their finest instruments for use in this project. The piano used in this case study was concert grand Bechstein (serial number: 13420, reference number 1940), made in 1882. The Bechstein was effortless to navigate, with a wonderfully rich and powerful tone. The mechanics, in excellent condition, were recently refurbished along with the pedals. Even though it is highly unlikely that Block's cylinders were recorded on piano of this size (length: 265cm, width: 155cm), this instrument was of a suitable age, while its size was surprisingly helpful; Besbrode Pianos is based in a Victorian warehouse, with huge open-plan showrooms. A piano of this size was necessary to fill the space and, if recorded in a smaller room, the same instrument would have been too loud and powerful.

Three recordings were reconstructed in this case study: 1) Anna Yesipova's (1851-1914) cylinder of Benjamin Godard's Gavotte in G, Op. 81 No. 2 (C136, made on the 15th November 1898 in Julius Block's home in Moscow); 2) Anton Arensky's (1861-1906) performance of his own Nocturne in D flat Major, Op. 36 No. 3 (C114, made on the 25th November 1894); and 3) Leonid Kreutzer (1884-1953) playing Frédéric Chopin's Mazurka in G minor, Op. 67 No. 2 (C141, made in 1915 in Germany).

Anna Yesipova was one of the leading pianists and pedagogues of the time, and Godard's Gavotte is her only surviving recording (although there are piano rolls that she made for Welte-Mignon). Yesipova had coaching from Liszt, and was one of the most important pupils of Theodor Leschetizky. Accordingly, it was very interesting to learn about her technique from this recording; although this 1898 cylinder is not very well recorded, it offers an audible example of her exquisite musical personality and

astonishing technique. I chose this wax cylinder as it was challenging to recreate her only surviving recording, without other sonic evidence to inform about this pianist's technique and pianistic style. I chose Anton Arensky's performance of his own Nocturne for different reasons. There are several surviving recordings of this composer playing his pieces, which inform us about his pianistic style and ideas. This cylinder was of my interest as I wanted to recreate composer's reading of his composition, which was different to what he wrote in the score. It was very interesting to explore the textual changes which Arensky made during his own interpretation of his piece. Lastly, cylinder of Leonid Kreutzer playing Chopin's Mazurka in G minor, Op. 67 No. 2, was the third recording in this case study. Kreutzer was a student of Anna Yesipova and Alexander Glazunov, and a well-known pianist of his time. This recording was chosen because of number of the textual changes, and his use of dislocation and rubato.

This case study began with a test of both the instrument and the room. It was a cold day, and the phonograph needle was making very shallow grooves in the wax; when the temperature is higher, the needle enters the wax more deeply and is therefore able to capture and reproduce at a higher volume. The room temperature, which was circa 15 degrees Celsius, meant that I needed to play much louder than planned. During the recording preparation, different types of recording cones were tested, along with their positioning. The types of recording cones, which vary in size and material, invariably determine aspects of the spectral and tonal balance and, for this recording session, we tested cones made of copper, tin, and tin wrapped with string, which varied in sizes between 60 and 100 centimetres. Grand pianos are more difficult to record than uprights, as it is more challenging to find a good placement for the cone, where the sound is neither overly strong nor overly weak. If the sound is too loud, the needle makes a very deep groove, and can even chip the wax on the cylinder. If the sound is not strong enough, then the needle does not make a groove deep enough to register sound on the cylinder. The recording cones were moved around the piano until an ideal best position was found, in which sound may be registered without risk of chipping the wax. At this point, the piano lid was opened, and the recording cone was facing it, standing on a table of appropriate height.

### **Three recordings, three different takes**

I did not aim to copy the original recordings, since I believe that that is neither possible, nor desirable. Rather, I absorbed some of the various ways the three pianists interpreted the recorded repertoire, and ultimately used the same kinds of expressional techniques used by the recording musicians - including dislocation, un-notated arpeggiation and metric rubato. I also made cuts in the text as on the original recordings, which was also necessary because of the duration of the cylinder (c.2'30").

Yesipova's recording is not the best quality, however even through a layer of hiss and cracks, it is more than obvious that the pianist had an extraordinary piano technique and musicality. Her legato was extremely smooth and sliding, and her recorded performance showcases an effortless and playful pianism. Gavotte is not a technically demanding piece, however it is quite fast with demisemiquaver runs throughout. Yesipova makes small textual changes, which sound improvisatory in their nature. When I started recording this piece with phonograph, it soon became obvious that I am not using the same type of pianistic technique as Yesipova. When played back, my cylinders were very clear. However, my playing did not have the kind of legato that Yesipova managed to produce on the original recording. Also, even though her cylinders are not particularly clear, her dynamic range is significantly more pronounced than I initially managed.

After series of experiments, I managed to make certain changes that achieved similar results to Yesipova. Firstly, I managed to achieve a dynamic range. However, I was forced to start this range with a quite loud mezzoforte at the quiet end. This enabled me

to vary my dynamic range, albeit in a demanding and unusual way, becoming very loud as I progressed. Secondly, it became obvious that Yesipova's legato was made entirely with her hand, and not her fingers; when using finger legato, my runs did not register as smooth as hers, but a switch made an immediate difference. By the time the recording was complete, I made five cylinders of this piece. I was not particularly satisfied with the sonic results. However, this reconstruction enabled me to learn the most; the process of registering sound on the cylinder, alongside using Yesipova's recordings as a guide, directed me towards a different piano technique.

When recording Chopin's Mazurka, Kreutzer stops his piece in measure 31. This is because he also recorded Liadov's Etude in F, Op. 37 on the same cylinder, and he would not have time to play both in their respective durations. Since I was not performing Liadov, I recorded the whole of the Mazurka. In doing so, I discovered a range of different problems. The piece is fairly slow, and Kreutzer uses numerous dislocations and unnotated arpeggiations, whilst changing tempo freely and often. When I listened back my first take, my left hand was almost inaudible. Once again, I had to address the dynamic range; the left hand had to be significantly louder than I originally intended it (almost as loud as the right hand). The sensation of playing this piece very loudly, almost without any dynamic difference between the hands, was very strange. Furthermore, I used many more dislocations than I would have done usually. The end recording, by contrast, suggests a subtle and gentle interpretation of Mazurka, with the left hand being much softer than the right, and with plenty of dynamic shadings.

The third recording, as previous two, produced similar problems in terms of the dynamic range, alongside some new complexities. Arensky performed his Nocturne with a range of expressional techniques and textual changes which I attempted to follow. As the final piece in the recording session, I took on board everything I learned when recording first two pieces and, by now, my left hand was louder and I was able to make more obvious dynamic shadings starting with mezzoforte dynamics for the lower pitches. The challenge, in this instance, related to duration; this piece is the longest of the three, as I almost ran out of recording time on the cylinder. The piece was almost too long to get on the cylinder completely, and I was constantly aware that I could run out of time, which particularly influenced my rubato playing - every time I slowed down, I made sure that I make it even later on.

In summary, therefore, I had to undertake a number of changes to my piano playing when recording on these cylinders:

- 1) The dynamic shading was very limited, and the cylinder could not register any playing below mezzoforte. This could be due to the cold weather, and room temperature; even though I used an extremely loud instrument, I still had to work hard in order to register all of the text.

- 2) The dynamic differences between the hands were severely limited. I wanted my left hand to be registered as it is on the original, meaning that I had to play significantly louder than I would normally attempt. This felt very unusual during the recording process, as my playing sounded very unmusical. The registered cylinders, by contrast, do not reveal this approach to recording; they sound as if the left hand was recorded significantly less loud than the right.

- 3) Dealing with the time limitations of the cylinder was extremely stressful, especially when approaching piece which was longer than the cylinder length. I was constantly aware that I might run out of time. This certainly influenced my performances, particularly when using rubato; I found myself rushing to make up for every ritenuto.

4) Because I had to play everything so loudly, I used more rhythmical changes than usual. Even though I have regularly used nineteenth-century playing techniques in my own practice, these became much more numerous during the recording. I would compare this with harpsichord playing, and the various ways in which a harpsichordist might use the rhythm and tempo to make an impression of the dynamic swelling. Once I was limited in the context of dynamics, I naturally relied on the rhythm's changes, which I consequently used more often than I otherwise might.

5) There was little point in using the pedal, since it does not register well on the cylinder. Clearly preformed notes often sounded fuzzy when captured and, as a consequence, I hardly used the pedal throughout the recording.

### **Conclusion**

The mechanical recording process explored in this case study has a significant limitation; it captures an extremely limited frequency range. The human ear is capable of discerning a frequency range of between 20 and 20,000Hz, whereas acoustic recordings could only capture sound between 100 and 4,000Hz (Maxfield and Harrison 1926; Bescoby-Chambers 1964; Day 2000). This implies that only a fraction of what we are capable of hearing was capable of being captured, but also, from a practical perspective, that certain instruments were easier to record than others; acoustic recordings were unable to reproduce all of the frequencies below the E below middle C and, at the other extreme, notes higher than the C three octaves above middle C (Day 2000). This does not mean that one is unable to hear the notes themselves; as Maxfield and Harrison explained in 1926, notes were often reproduced with harmonics alone, thus affecting the quality of the tone and their characteristic timbres (Maxfield and Harrison 1926).

For this reason, I was required to adjust the playing between the two hands, along with my overall dynamic range. The lack of any electrical or artificial amplification, along with the nature of the medium, meant that the dynamic range is limited, and very quiet sounds were impossible to capture. When recording, I was required to play loudly; however, I had to be careful not to be too loud, otherwise I could have chipped the wax of the cylinder, and the recording process would have to start again. Frequency range and dynamic range are restricted to the point that, when recording, I found pedalling very hard, similarly to Mark Hambourg's description about "watching the pedal (because it sounds so bad); thinking of certain notes which had to be stronger or weaker in order to please this devilish machine" (Hambourg 1931).

Timing was another problem; the mechanical process had another limitation in terms of the length of music that could be recorded on to a single wax cylinder. Two-minute cylinders (pre-1900) were replaced by four-minute Amberol cylinders in 1908 and, in 1904, long-playing cylinders were developed which played up to twelve minutes. I was recreating the early cylinders, therefore the timing (circa 2 minutes) presented quite a challenge. It was, perhaps, both fashionable and necessary to make cuts in the musical text when dealing with longer repertoire, particularly in the context of recording.

Conducting this case study showed how much I needed to change my interpretation, playing and technique in order to register the sound mechanically. It was highly challenging, with a number of things that I would not consider if recording digitally. I would compare this experience to the kind of exaggerated concert experience (especially in a large hall), when pianists tend to think about how their performance will sound at various points in the hall (the furthest seat from the stage, for example). The mechanical recording process involved a similar projection of playing, albeit much more pronounced. The difference between what is played and what is registered is immense, however one understands this very quickly and adjusts the playing, in order to be satisfied with the end result.

There are a range of possible directions that might be followed as a consequence of this case study. The things I am particularly interested in include: research on the registered dynamic range, spectral balance or frequency spread, and pitch changes in recordings (depth of distortion which sounds like a small vibrato on particular notes). Understanding of these variables will help to further clarify the processes involved in recording with wax cylinders and explain the many things that performers were required to do in their own performance practice. My hope is that these reconstructions will offer clarification in terms of how much of the changes needed to be done and in which particular ways. Like this, we might be able to fully grasp aspects of past performance practices and develop a body of knowledge about the recording process which bridges the divide between performance and recording.

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