

## Fiddle tunes from under the bed: extracting music from Carpenter's recordings

*Elaine Bradtke*

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Excerpted from:

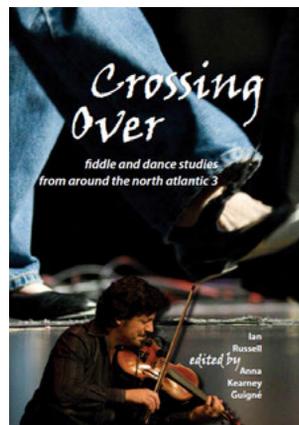
### Crossing Over

Fiddle and Dance Studies from around the North Atlantic 3

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## Fiddle tunes from under the bed: extracting music from Carpenter's recordings

ELAINE BRADTKE

Mississippi-born, Harvard-educated James Madison Carpenter (1888–1983) drove around Britain between 1928 and 1935 with a dictaphone<sup>1</sup> cylinder machine, capturing songs, stories, tunes and customs (Figure 1). Because his work falls chronologically between that of Cecil Sharp and Percy Grainger at the beginning of the twentieth century, and later field recordings made by the BBC in the middle of the century, it provides an important glimpse into this otherwise neglected era in British traditional culture. Despite his intentions, Carpenter's collection was never published, or until very recently even properly indexed, therefore it represents a relatively untapped resource.



**Figure 1** James Madison Carpenter with his Austin Roadster  
*The James Madison Carpenter Collection, Archive of Folk Culture, American Folklife Center,  
Library of Congress, AFC 1972/001, Photo 102*

In 1972, the Library of Congress purchased Carpenter's vast accumulation of manuscripts, photographs, and sound recordings and it is now held in the American Folklife Center's Archive of Folk Culture. Prior to that, at least some of the boxes and mail sacks were stored under his bed in the sultry Mississippi climate. A long-term international project has produced and updated an online catalogue of the collection and the team is now in the midst of transcribing and editing Carpenter's material for publication. Although Carpenter taught himself to transcribe music in order to notate the songs, there are no extant transcriptions of the fiddle tunes and only one transcription of dance music (from a concertina player). The task has fallen to me to transcribe the instrumental music in his collection. The following is a discussion of what has been learned about Carpenter's field recording techniques, the methods available to the non-technician for extracting music from poor quality audio, the reliability of the recordings as to pitch and tempo, their usefulness as sources for stylistic information, and the pros and cons of highly detailed music notation.<sup>2</sup>

### **The fiddle players**

Carpenter made approximately sixty recordings of fiddle music from a handful of musicians, primarily in the English South Midlands. His three main sources of fiddle tunes were John Robbins of Bidford-on-Avon, Warwickshire, Sam Bennett of Ilmington, Warwickshire, and William Wells of Bampton, Oxfordshire. One additional tune was recorded from an unidentified musician near Stow-on-the-Wold, Gloucestershire. From outside this region there is an example of the Greatham (County Durham) sword dance tune, and, from Scotland, an instrumental version of a Child ballad.

### **The music**

In a letter to Kitteredge, dated 21 November 1933 and written from London, Carpenter reports that he had recently collected 'at least two score of morris-dance and folk-dance tunes, with nearly a score of the droll, enigmatic word-sets that were sung in snatches to the accompaniment of the tunes'.<sup>3</sup> The examples of fiddle playing are largely functional music – the dance tunes mentioned above. However, the fiddlers were not recorded in the act of playing for dancing.

### **The recording equipment**

Carpenter used a cylinder recording machine that could run on a six-volt battery.<sup>4</sup> Most dictating machines of this era could use either direct or alternating current, which meant that as long as one had an automobile (and its battery) one could use the machine regardless of the availability of electricity. The portable dictating machine that Carpenter used was never designed for recording instrumental music. They were intended for use by executives who would dictate their speeches and correspondence onto a cylinder, which would be played back on a different machine by a typist for transcription. The sound was funnelled to the cutting stylus by means of a speaking tube, held close to the speaker's mouth. Carpenter presumably held

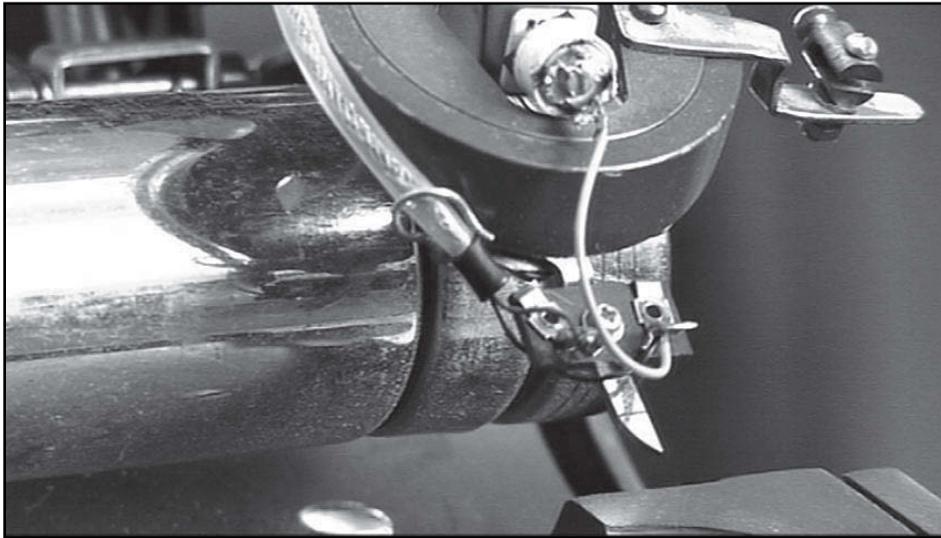
the speaking tube to the 'f' holes of the violin while recording, meanwhile staying out of the way of the bow. Most importantly, the recording machine had extremely limited facilities for playback, which would have made it difficult for Carpenter and his contributors to check the sound quality of the recordings as they were made.<sup>5</sup>

In the business world, the dictaphone system was seen as an improvement on the older phonograph recorder (which combined recording and playback in one machine). The functions of record, playback, and erase were now distributed between three machines; one to record (with limited playback facilities), one for transcription which had a start/stop switch and flexible speed adjustments for use by the transcriber who listened with ear tubes similar to a stethoscope, and a third machine to shave the cylinders, allowing them to be re-used. The separation of functions was well suited to the compartmentalization of early twentieth-century offices, and rather less suitable for the travelling ethnographer.

### **The recordings**

We know that Carpenter shaved some of his earliest cylinders in order to re-use them, but he preserved his subsequent recordings.<sup>6</sup> In this, he was rather forward looking, as most early field recordings were seen as merely aids to transcription. Among ethnographers and folklorists, transcription and subsequent analysis were considered more valuable than the audio artefact itself.<sup>7</sup> As Erika Brady wrote 'the wax cylinders containing recordings of songs and narratives seem to have been considered hardly more important than steno pads once a letter has been typed in its final form'.<sup>8</sup> We do not know exactly what changed Carpenter's mind regarding the disposability of his recordings. Possibly it was his realization (as expressed in a letter to the editor of the *New York Times*) that once the recordings were destroyed he had no way to answer any questions that might have arisen from the transcriptions at a later date.<sup>9</sup> He also found the cylinders useful for illustrating lectures. In early 1938, Carpenter corresponded with Alan Lomax at the Library of Congress. Lomax stated his interest in Carpenter's valuable recordings and his hope that the cylinders should not be worn from repeated playing before they were copied.<sup>10</sup> Around this time Carpenter began to copy his cylinder recordings onto 12-inch 78 rpm acetate discs.<sup>11</sup> There is an Ediphone cylinder playback machine at the Library of Congress with an attachment designed to transfer the sound from the cylinder machine to a disc-cutting machine, which is believed to be the one that Carpenter used for this purpose (see Figures 2 and 3).

The condition of the original cylinders, more than seventy years after the recordings were made, is frankly, not very good. They suffer from shallow grooves, some of them are badly worn, cracked, and pitted, and the wax itself is beginning to degrade. In addition, the process of copying the cylinders to discs may have caused further damage.<sup>12</sup> It follows that the extant audio is often either faint or distorted, and obscured by a great deal of surface noise. The combination of less than ideal recording speeds, subsequent use, and decades of storage in poor environmental conditions have taken their toll on the sound quality. As part of a British Academy



**Figure 2** The Ediphone cylinder playback machine owned by the Library of Congress

**Figure 3** A close up of the disc cutting mechanism

*Photos by Chris Jackson BBC*

funded project to catalogue Carpenter's sound recordings, we compared the disc and cylinder copies in terms of speed and sound quality. Occasional passages are sometimes clearer on the discs, though the signal tends to be weaker, due to loss that occurred in the transfer process. We are investigating the possibility of another digital transfer, and further sound restoration options. Unfortunately no level of restoration will bring back audio that no longer exists in the original.

If the poor physical state of the cylinders was not barrier enough to the prospective listener, there is one further complication that had a detrimental impact on the quality of the sound. Dictaphone recording machines could run at variable speeds, a feature that Carpenter exploited all too frequently. According to sound engineer Steve Smolian, who was asked to evaluate the recordings in the collection:

Business cylinders typically run at 90–100rpm, giving a playing time of more-or-less 10 minutes. In conversations with Library staff concerning the folklore accompanying this collection, it was felt they may run at about 75 rpm, extending the playing time to 12 or so minutes. At this slow speed, expectations of fidelity become limited.<sup>13</sup>

In fact, some of the cylinders have produced more than eighteen and a half minutes of audio, approximately eighty-five percent more than the usual duration. In remote areas of 1930s Britain, blank wax cylinders were scarce. When he worked with prolific informants Carpenter was evidently willing to sacrifice fidelity for quantity.

His cylinders and their disc copies, along with his notes, transcriptions, photographs and typed texts formed a large mass of material that in later years he stashed under his bed, as he reluctantly gave up hope of publishing it. In the early 1970s Alan Jabbour contacted Carpenter and started the wheels in motion for Carpenter's life's work to be bought by the Library of Congress. Once in their new home, the disc recordings were copied onto open reel tapes for preservation and listening purposes. The originals were then stored in climate-controlled conditions for the first time. At the time the collection was acquired, the Library of Congress staff thought the discs were straight copies of the cylinders, and therefore copying the cylinders onto tape was considered unnecessary. As part of the Save Our Sounds: America's Recorded Sound Heritage Project, the Library of Congress had digital copies made of the original cylinders and discs, and subsequent cataloguing of both formats has proven that they are not straightforward copies. Some cylinder tracks were copied more than once, some not at all, and some recordings exist only in the disc format. The digitization project was possibly the first time the cylinders were played since Carpenter made his disc copies. The American Folklife Center specified a flat transfer, without any tweaking, adjusting, or cleaning up of the audio. The end result is pretty much what one would hear if the recordings themselves were played back. This has been a disappointment to many researchers who were hoping the digital recordings would be easier on the ears than the tape copies of the discs, but in fact found the sound of the cylinders to be even less palatable. These unprocessed versions of Carpenter's recordings will eventually be made available to the public, along with scans of his manuscripts via the Library of Congress' online *Performing Arts Encyclopedia*.<sup>14</sup>

### **Working with the digital surrogates**

Unclear, disrupted and distorted audio such as this makes transcription all the more challenging. Thankfully, reasonably priced audio processing software is widely available for use by non-technicians. Criteria for our project included the ability to independently alter the speed and pitch of the recordings, accurately mark and time each segment (there are no breaks in the digital transfers), and reduce some of the noise and boost the weak signal, all without altering the original digital recordings. The unfortunate combination of a small budget and limited experience in computer-based audio manipulation, necessitated software that was both inexpensive and user-friendly.<sup>15</sup> We chose two separate software packages, which, although they overlap somewhat, were designed with different uses in mind:

1. Amazing Slowdowner – A transcription tool that alters the speed of the playback or the pitch, independently, and in real time. Useful facilities include an equalizer, adjustable loop length, and the ability to save individual tracks. It runs on Mac and Windows platforms.<sup>16</sup>
2. Magix Audio Cleaning Lab 2005 – A processing tool designed to enhance the sound of analogue recordings and transfer them to CD. Features include noise reduction, equalization and filtering, the creation and editing of individual tracks, and an amplitude display. Some of the adjustments can be made in real time, which provides quick feedback. Unfortunately, it only runs on Windows operating systems, comparable Mac software, at least at the time we were looking, was prohibitively expensive.<sup>17</sup>

From the point of view of someone who learned to edit recordings with a razor blade and splicing block, it was reassuring to see how little has changed, at least on a superficial level. In both cases, the user interfaces emulate the features of analogue equipment using stop, fast forward, rewind, and pause buttons to navigate, and sliders and knobs to adjust the audio output.

Slowdowner is much more flexible about altering the speed and pitch in real time, and for creating variable length playback loops. Combined with its built in equalizer, it proved the best all around choice for transcription. Audio Cleaning Lab was used to set track markers, and timings, while employing the equalizer and filters to further enhance the audibility. Its amplitude display is a useful tool for finding the start and end points of tracks.

Cleaning up old, noisy recordings such as these can be time consuming and frustrating. The process may create audio artefacts such as weird burbling sounds, howls, and whistles. Regrettably, the noise reduction also reduces the impact of sibilants and other consonants. For our purposes, a very light touch was used, and the full brunt of the software brought to bear on only the really desperate cases.

A number of sample tracks have been sent to professional audio restoration technicians with specialist equipment. Because of the low signal to noise ratio in the digital files, it has been interesting, and disheartening to find that they cannot do much more than we can with our amateur system. Though there are new

## BRADTKE *Fiddle tunes from under the bed*

developments that may be able to extract better sound from the original cylinders, in turn promising better results from audio cleaning and restoration.

The image displays a musical score for the fiddle tune "Fiddle tunes from under the bed" by Bradtke. The score is presented in two systems, each containing three staves. The first system includes staves for Bennett, Robbins, and Wells. The second system includes staves for B, R, and W. The music is written in G major (one sharp) and 6/8 time. The notation shows various rhythmic patterns and melodic lines. A key observation is that the transcription for William Wells (W) includes an extra beat at the end of the phrase in measure 8, which is not present in the other transcriptions.

**Figure 4** A comparison of transcriptions from the three fiddlers.

Note the extra beat at the end of the phrase in the transcription from William Wells.

### **Reliability of the recordings as source documents**

In the process of cataloguing, transcribing, and comparing the disc and cylinder recordings that Carpenter made, certain points concerning their reliability as source material became clearer. These recordings cannot provide us with information on the tempo of the music. Firstly, the recordings of dance music were made out of context (without the necessary interaction of dancers). Secondly, the speeds of the recordings themselves are known to be unreliable. Carpenter admitted slowing the recorder to eek out more time. Without a reference pitch, we cannot adjust the playback to reproduce the pitch and tempo of the original performance. With a modern concert violinist, this might only require a simple speed correction to bring the pitch to A 440, and the playback would then be reasonably accurate. Sam Bennett and William Wells however, were known to use non-standard tuning (less is known about Robbins). Wells and Bennett both sang along with their fiddle playing and tuned their instruments to suit their vocal ranges. A recent discovery of a sound film of Sam Bennett provides evidence that he may have tuned a whole tone sharp.<sup>18</sup> A 1937 recording of William Wells shows that he tuned substantially flat.<sup>19</sup> Alas, Carpenter did not provide a reference pitch at the start of the recordings, so we will probably never know what the original really sounded like.

However, there are some pieces of information that may be gleaned from the recordings. Despite the issues surrounding the speed and pitch of the performances, we are able to discern what notes were played in a relative sense. The notes, as fingered, may be derived through the reference points provided by open strings and

drones. While the presence of noise or the use of noise-reduction technology often masks the sound of bow changes, most of the time it was possible to hear slurs and tied notes. Ornaments, when present were much easier to hear, especially with the slow down and loop facilities.

In transcribing the recordings by each performer, it became possible to build up a picture of their individual styles through their use of drones, double stops, slurs, and ornaments (see Figure 4). William Wells was the most nimble-fingered of the three; his playing is full of ornaments and double stops. Sam Bennett had a more straightforward, driving style and he supplemented the melody with lots of open string droning. John Robbins had a lighter touch; he used fewer drones and practically no ornamentation, in line with his more formal music background.<sup>20</sup> Based on these differences in style, it was possible to identify the performer when Carpenter's attributions were absent or incorrect.

### **Notating the music**

In any transcription project it is important to find the right balance between simplicity and detail in music notation. This balancing act has been the subject of much debate since the first uses of sound recordings as an aid to folksong collecting. Percy Grainger's 1908 article in the *Journal of the Folk-Song Society* demonstrated his attempts to accurately notate folk music (see Figure 5). He sought to reproduce on paper with the aid of numerous special symbols an objective portrait of the subtleties of pitch and rhythm, ornament and dialect of a recorded performance.<sup>21</sup> Yet he was less than happy with the cluttered results and wrote that 'my attempts at comparative exactitude result, I must confess, in a regrettably disturbing impression to the eye'.<sup>22</sup> Furthermore, he lamented the inadequacies of even his enhanced form of music notation and looked with hope for a machine that could transcribe more accurately than the fallible human ear, and render it into a 'readable and universally applicable musical notation'.<sup>23</sup> One hundred years later, we are still waiting.

Grainger's use of the phonograph as an aid to in-depth analytical transcription met with resistance on the part of the other members of the Folk Song Society. This was articulated by Anne G. Gilchrist, who felt the recordings themselves were unreliable.<sup>24</sup> Brady writes that Gilchrist and Cecil Sharp 'objected to the phonograph as a means of recording that was *too* precisely accurate. They believed that ultimately the subjective response of the human ear best caught and conveyed the content of a performance'.<sup>25</sup> Sharp was wary of the phonograph's ability to allow the transcriber to slow down and repeat a song, putting the song under a metaphorical microscope to detect details that the ordinary listener cannot hear. He wrote, 'In transcribing a song, our aim should be to record its artistic effect, not necessarily the exact means by which that effect was produced'.<sup>26</sup>

Cecil Sharp's approach to transcription was to distil the essence of the song from multiple performances by the singer. This process tended to repress some of the variations that occur naturally between verses. Grainger preferred exacting detail extracted from repeated hearings of recorded performances written out in their

**12.—LORD MELBOURNE.**  
(THE DUKE OF MARLBOROUGH.)

SUNG BY MR. GEORGE WRAY,  
AT BRIGG, LINCOLNSHIRE, JULY 28TH, 1906.

*Thrice phonographed and noted by Percy Grainger.*

Phonograph record A  
Sung in (A♯, ? A♯). FAST. M.M. ♩ = about 176. *Jerily, and with restless great energy.*

200

**Figure 5** Percy Grainger's notation from a phonograph recording.

Percy Grainger, 'Collecting with the phonograph', *Journal of the Folk Song Society*, 3 (1908), 200.

*Reproduced courtesy of the English Folk Dance & Song Society*

entirety. Our team's transcription practice falls somewhere in between Sharp and Grainger. Instead of Grainger's system of marking up the music with symbols, and frequent changes of metre, we have used accompanying commentary, explaining for example, raised or flattened pitches, rhythmic anomalies, alterations in tempo, held or stressed notes, and so on. Unlike Sharp, we notate the entire tune with all its repetitions written out. This gives a more realistic account of the subtleties and variations that occur in the course of a given performance. My colleagues working with the song material chose to hide the frequent changes in metre, because they interrupt the flow of the music and 'disturb the eye'. However, English dance musicians tend to have very regular rhythm and tempo, and therefore any changes are significant, such as slow music used for sequences of exaggerated steps known as slow capers. In the case of dance music, changes in metre and tempo directly reflect changes in choreography and must be included.

### **Simplicity versus complexity**

The transcriber must keep in mind the use for which the notation is intended. My first fiddle tune transcriptions were heavily marked with accents and articulation to indicate nuances of pressure and motion of the bow arm (see Figure 6). I was listening and transcribing as a fiddle player, intent on the minutia of the captured performance, and notating information that would be needed to reproduce this performance. When presented with the detailed notation, my colleagues (who are not fiddle players) did not hear the accents and articulations that were noted, or understand what they represented in terms of violin playing technique. To them, and to most people who do not have experience with the notation peculiar to bowed strings, this was superfluous and possibly confusing information. After some discussion, it became a team policy to note down only pitch and rhythm, omitting stylistic indications such as articulation and accent, in part to make the transcriptions more useful to a wider audience.



**Figure 6** An overly detailed transcription of the playing of Sam Bennett  
*Carpenter Collection, Cylinder 105 06:39*

There were good reasons for limiting how much information we notated from the recordings. Firstly, the aim of the project is to produce clear, easy to read transcriptions, to be used in conjunction with the recordings by performers and scholars of varying musical ability and experience. Our approach is descriptive rather than prescriptive, providing a general picture of the contributor's presentation of a tune rather than a specific indication of every detail in that particular recording. The performance aspects that we omit from the notation may be picked up from listening to the recordings, which will be available on the web.

Secondly, many of these tunes are in my own repertoire, and it is disconcerting how much the transcriber's own memory may colour the perceived sound. In fact, the first attempt at transcribing 'Bumpus o Stretton' resulted in something between

how Sam Bennett played it, and how I play it. Research into how the brain processes and remembers music has shown that the greater number of neural links involved, the stronger and more powerful the memory.<sup>27</sup> In addition, Levitin, writing about music, states ‘people use the same brain regions for remembering as they do for perceiving’.<sup>28</sup> In the case of ‘Bumpus o Stretton’, this particular transcriber had memorized, rehearsed and performed on many occasions both the tune and the dance. This repeated use of multiple neural links, reinforced over time, created overpowering musical memories that threatened to override the perception of the weak and sometimes broken sound coming through the headphones. There is much to be said about being too close to the subject. It is far better to keep the transcription simple and general rather than complex and specific. Too much detail may actually impede understanding, and in-depth scrutiny shifts the focus from the tune to the performance. Also, keeping it simple helps guard against the possibility of memory overriding perception (see Figure 7).



Figure 7 Simplified transcription of the playing of Sam Bennett  
*Carpenter Collection, Cylinder 105 06:39*

### Reliability of transcription and transcriber

Since Grainger's article, a great deal has been written about the reliability of transcriptions from recorded sources.<sup>29</sup> Perhaps the most interesting conclusions have been drawn from the work of George List. His research shows that no two transcribers will notate a traditional song in exactly the same way, and the differences become greater the more the tune strays from the familiar (western art music) scale system and even, regular rhythm and pulse.<sup>30</sup> Within our own team we experimented with each of us transcribing the same melodies. Upon comparison, the results were predictably varied, each individual's notation reflected their own knowledge, interest, and experience.

This brings us to the final phase of the process, checking the work. This is tedious, but absolutely necessary, and is best undertaken after some time has passed. Even the most painstaking transcriber will find mistakes. When a person has to listen to and concentrate so intently on such difficult to hear examples, auditory hallucinations become an occupational hazard, especially working with familiar material. The brain will fill in blanks from memory and make allowances for

fluctuations in pitch and rhythm. In the process of checking, problematical passages will be subject to intense scrutiny, again, convoluted rhythms will be re-notated, again. As a fellow ethnomusicologist admitted in frustration, 'Every time I go back to a transcription, I change my mind'. After checking our own work, we have found the eyes and ears of a second person to be helpful. It is important, however, that they focus on finding obvious errors rather than dwelling on disagreements concerning subtleties of interpretation.

### **Conclusion**

It is tempting to complain about the difficulties of using the sound recordings in Carpenter's collection. Through his enthusiasm for their contents, Carpenter damaged the recordings he had worked so hard to obtain. He squeezed too much onto his cylinders, wore them down by playing them back, and kept them for years in less than optimal conditions. Despite these faults, it remains an extraordinary resource.

While we may not be able to use it to answer the question of how fast or slowly these tunes were performed, there are other questions that may be answered about playing technique. With careful listening, bowing, ornamentation, double stops, and articulation, important tools of the dance musician's trade, may be heard, thus increasing our understanding of how this music was performed. A comparison of transcriptions shows how the three principal fiddle players in his collection employed distinctive styles, displaying a wider range of performance practice than had been previously understood. In addition, the whole procedure of cataloguing, transcribing, and making links between related items scattered in different physical formats gives us insight into Carpenter's working methods. In dragging it out from under the bed, thus realising Carpenter's dream of publication, we expose the collection to a wide range of people who will learn from and interpret it in their own way.

Appropriate use of audio restoration and manipulation technology enables us to extract music from recordings with very poor signal to noise ratios, especially when used during repeated, analytical listening. However, the transcriber must keep in mind both the needs and abilities of the end user throughout the transcription process, and their own fallibility. There is a spectrum between what is possible to notate and what is useful as functional notation. It ranges from the highest level of detail which may represent on paper aspects that are not capable of being heard without technological intervention, to a guide to be used in conjunction with a recording, or a simple aid to memory. No matter where we choose to place our notations within this spectrum, we must be prepared to admit that there is no such thing as a perfect transcription.

### **Notes**

<sup>1</sup> At the time of writing it is still uncertain whether Carpenter used a Dictaphone dictating machine or its close competitor the Ediphone. The machines held at the Library of Congress,

which Alan Jabbour believes were acquired with the collection, are Ediphones, but of a later manufacture date. Both machines used the same sized cylinders and nearly identical technology; 'dictaphone' was the generic term for the equipment, regardless of the brand.

<sup>2</sup> The author gratefully acknowledges the support of the British Academy for funding the research on which this article is based.

<sup>3</sup> The James Madison Carpenter Collection, Archive of Folk Culture, American Folklife Center, Library of Congress, AFC 1972/001, MS p. 06395.

<sup>4</sup> Julia Bishop, "'Dr Carpenter from the Harvard College in America": An Introduction to the James Madison Carpenter and his Folklore Collection', *Folk Music Journal*, 7 (1998), 404.

<sup>5</sup> I am indebted to Michael W. Smith for information regarding the dictating machine technology, and help in identifying the Ediphone owned by the Library of Congress. For background information and photographs of the machines in use see *The Early Office Museum*, [http://www.officemuseum.com/dictating\\_machines.htm](http://www.officemuseum.com/dictating_machines.htm) [accessed 24 February 2009].

<sup>6</sup> Carpenter Collection, MS 09637.

<sup>7</sup> Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Reproduction* (Durham: Duke University Press, 2003), p. 325.

<sup>8</sup> Erika Brady, *A Spiral Way: How the Phonograph Changed Ethnography* (Jackson: University Press of Mississippi, 1999), p. 62.

<sup>9</sup> Carpenter Collection, MS 09637. One of his informants had played a practical joke on him using a fake dialect.

<sup>10</sup> Carpenter Collection, MS 00081.

<sup>11</sup> Bishop, p. 412.

<sup>12</sup> Steve Smolian, 'Methods to Copy Cylinders in the Carpenter Collection', a report sent to Jennifer Cutting at the Library of Congress, 31 October 2000, p. 1.

<sup>13</sup> *Ibid.*

<sup>14</sup> <http://www.loc.gov/performingarts/> [accessed 24 February 2009].

<sup>15</sup> Constant, rapid changes and developments in computer technology mean that the software we used may be obsolete by the time of publication. Any researchers undertaking a similar project will need to investigate the current options for themselves.

<sup>16</sup> <http://www.ronimusic.com/> [accessed 24 February 2009].

<sup>17</sup> <http://www.magix.com/uk/audio-cleaning-lab> [accessed 24 February 2009].

<sup>18</sup> The 35 mm De Forest test film, *Dances by Ilmington Teams in the Grounds of Peter De Montfort's House: Fiddler Sam Bennett, 1926*, owned by Ronald Grant of the Cinema Museum, London.

<sup>19</sup> A live performance of 'The Quaker', recorded by Douglas Cleverdon, 24 April 1937; BBC 1322, released on *You Lazy Lot of Bone-Shakers: Songs & Dance Tunes of Seasonal Events*, The Voice of the People, vol. 16, Topic TSCD 666, 1998.

<sup>20</sup> Keith Chandler, 'Musicians in 19th Century Southern England: No 16, John Robbins of Bidford-on-Avon, Warwickshire (1868–1948)', (2006) [http://www.mustrad.org.uk/articles/mus19\\_16.htm](http://www.mustrad.org.uk/articles/mus19_16.htm) [accessed 24 February 2009].

<sup>21</sup> Percy Grainger, 'Collecting with the phonograph', *Journal of the Folk Song Society*, 3 (1908), 147–69.

<sup>22</sup> Grainger, 'Collecting with the phonograph', p. 152.

<sup>23</sup> *Ibid.*

<sup>24</sup> Michael Yates, 'Percy Grainger and the Impact of the Phonograph', *Folk Music Journal*, 4 (1982), 267.

<sup>25</sup> Brady, p. 83.

<sup>26</sup> Yates, p. 270.

<sup>27</sup> Steven J. Mithen, *The Singing Neanderthals: The Origins of Music, Language, Mind and Body* (London: Weidenfeld & Nicolson, 2005), pp. 54–58.

<sup>28</sup> Daniel J. Levitin, *This is Your Brain on Music: The Science of a Human Obsession* (New York, NY: Dutton, 2006), p. 150.

<sup>29</sup> Nazir A. Jairazbhoy, 'The "Objective" and Subjective View in Music Transcription', *Ethnomusicology*, 21 (1977), 263–73, provides an overview of some of the questions that have plagued ethnomusicologists on this topic.

<sup>30</sup> George List, 'The Reliability of Transcription', *Ethnomusicology*, 18 (1974), 374.