

ON HISTORICAL SOUND RECORDINGS

EVERY HISTORICAL PERIOD HAS its own array of technologies with which to create in the present, and with which to view the artefacts of the past. Every historical period is thus both limited and potentiated by its technologies. When sound recording was born, the shortcomings of the technology were, I assume, both extremely obvious and yet less important than the very fact that this technology now existed, against the backdrop of its previous absence from the whole of mankind's known history. When people listened to recordings of music during the late 19th and early 20th centuries, they had nothing else to compare it with than "live" sound. The shortcomings of the sound reproduced from recordings were presumably offset by factors such as novelty, accessibility, repeatability, etc. We are obliged to take as axiomatic that the experience of records at that time did not include comparison with "better" reproduced sound of the kind available as the 20th century progressed.

With the history of recorded sound now at least 150 years old, and with the ongoing development of a theory of discography and of a musical historiography based on recorded sound, we are now faced with a dilemma. The music recorded in the past was heard in the past with the available technologies. Axiomatically, that was what recorded music was to the listener of the time. A history of music is at least in part a history of what people listened to at a given time. In 2012 we have a number of alternatives available to us when we listen to audio recordings from, say, 1905. Here are a few:

1. We can listen to an original disc on various gramophones of the period (i.e., of various qualities and sophistications) with a steel or fibre stylus of the period. We can then, if we wish, choose to use modern recording equipment to record the sound emanating from the period gramophone, and transfer it to an audio carrier of our choice, e.g., CD or LP.
2. We can listen to the same disc using a modern turntable with a modern stylus that has been scientifically dimensioned (for example, with a radius corresponding to the width of the groove on the particular record, and perhaps in the form of a truncated cone in order to eliminate a large quantity of extraneous noise that does not emanate from the original audio signal but from subsequent groove wear/damage). Here, we have further alternatives - we can choose to adjust turntable speed according to our knowledge of the tuning conventions of the period; likewise we can adjust the equalisation curve of the preamplifier according both to our musical judgement and to our knowledge of historical procedures. We can then choose to make a CD or LP from the resulting signal.
3. We can use either analogue or digital technologies, or both, to refine equalisation and to remove even more extraneous noise - "snap, crackle, and pop," and hiss, emanating from physical limitations of, and damage to, the medium.
4. We can even go a step further, and, having with the greatest care recovered the musical information according to the possibilities mentioned in 2 and 3 above, choose to rethink the recording acoustic in terms of present day possibilities. We can, as did the late Robert Parker, reason that many early recordings were, for various reasons, made in acoustically "unnatural" spaces, with a resulting unnaturally dry acoustic quite different to how the music would have sounded when played for a "live public" in its natural surroundings. We can use sophisticated digital technology to remodel the sound and the acoustic and produce recordings from 1928 in Dolby Surround Sound!
5. As a further comment to the points above, if we are interested in surmounting the audio limitations of today's conventional CD technology, we can set the initial digital sampling at higher resolution than the worldwide 16-bit 44 kHz CD standard. By using 24-bit 96 kHz sampling, dynamic range resolution increases by a factor of 256, and the theoretical frequency range more than doubles, while the amount of digital information only multiplies by a factor of about three. Such information, if used to master an LP, can give superior audio results compared to conventional CDs, which is one reason why the current resurgence of interest in analogue reproduction is not just a matter of fetishism.

Now - how are we then to define sound restoration in musicological contexts? I would suggest that we must accept that we have several alternatives, all of which are justifiable for different, equally valid reasons. Here are two:

1. We want to hear how recordings sounded to listeners of the time.
2. We want to use all the technology at our disposal to be able to hear the sound in a state as near as possible in character to the best we have today, i.e., as though it were recorded then, but with today's technology. *Nota bene:*

“today’s technology” is of course by no means immutable, as is the original technology with which the historical recordings were made.

Thus for scientific purposes a reissue of historical recordings would ideally offer at least two “versions” of each recording. At least one scientific reissue series, *Tondokumente aus dem Phonogrammarchiv der Österreichischen Akademie der Wissenschaften - Gesamtausgabe der Historischen Bestände 1899-1950* offers “as a compensation for those who have the necessary equipment and take a special interest in the unprocessed transfers, ... the delivery of such copies for a nominal fee.”

Finally, we can see this dichotomy as a reflection of the difference between the natural scientific and the hermeneutic paradigms, between the ideas of “objectivity” and “subjectivity,” between “scientific observation” contra “humanistic interpretation.”

We have here a parallel conundrum to that which arises within the field of interpretation and performance of so-called “early music” in the classical music field. In a nutshell, however much we make the effort to perform the music “authentically,” i.e., as it would/could/might have sounded at the time, it will never again be heard by an “authentic” audience, as that audience has been dust for centuries.

ON CARING FOR 78 RPM RECORDINGS

THIS SECTION IS ABOUT reissuing music on 78 rpm discs. I am going to take the risk of saying things that may be self-evident to you, the listener, rather than risk missing the chance of making the points I passionately want to make. I am talking out of nearly 60 years experience of listening to 78s on equipment ranging from 1940s wind-up gramophones to contemporary state-of-the-art hi-fi equipment, with varied stylus dimensions, variable non-RIAA (Recording Industry Association of America) equalisation, and, over the past few years, the experience of preparing and releasing Greek rebetika 78s on CD.

My background, as relevant here, is that I am also a musician and multi-instrumentalist with more than 50 years of amateur and professional playing experience on various stringed and wind instruments, playing very different sorts of music, from Greek *rebetika* and Zanzibari taarab to renaissance and baroque lute, but also blues, country, Irish folk, and the British and American “folk” music of the 60s. I am not a professional sound engineer, but I do consider that I keep to within the limits of what I know and understand in the following.

Used 78s can vary in condition from mint to the virtually unlistenable. A number of gifted sound engineer enthusiasts have worked with commercially sold 78s in varying condition since the late 1940s, when other media became potential carriers of music originally recorded in 78 rpm format. Parallel with that, the large record companies began reissuing 78s in LP format, often with the enormous advantage of direct access to metal parts or unplayed archive discs. In spite of their advantage, it is probably not a generalisation to say that reissues by the large companies do not stand up well in comparison with reissues engineered by gifted sound engineer enthusiasts (always driven by a passion for the music they handle).

As I see it, there are several reasons for the failure of the large companies to do a good job of 78 rpm reissues. Please take these hypotheses for what they are, not as categorical and generalising statements; there have always been the odd exceptions.

First, the advent of microgroove records and the RIAA standard suddenly relieved the record-buying public of that ubiquitous 78 rpm surface noise, creating a natural public expectation for all LPs and 45s to be as silent as possible apart from the music. The CD era has of course accentuated these expectations beyond the sane.

Second, there was a mistaken assumption that the information in 78 rpm grooves was of such a limited frequency range, that removing surface noise would not risk removing musical information.

Third, the engineers did not necessarily have a significant musical relationship to the music they worked with, and thus lacked the motivation and musical knowledge necessary when working with this kind of material. If you don’t know what an instrument or a music sounds like “live,” you have very little to go on when considering questions like equalisation, for example.

Finally - and most important of all - there was a failure to make the vital distinction between a clarity that enables the listener to hear audio events as “objective facts,” and the kind of sound reproduction that allows the music to interact with the listener’s brain and result in an emotional and physical experience.

In other words, if you’ll excuse the pun, cleanliness and goodliness are not synonymous when it comes to restoring the musical information contained in the grooves of 78 rpm records.

When it comes to the nitty gritty of working with original 78s, there are several stages, of which the following is a perhaps oversimplified résumé. Basic to the understanding of this is a breakdown of the artefactual components of what is to be heard on 78 rpm discs.

First of all, there are the acoustic limitations of the actual recording techniques employed at various times. These limit the frequencies that can be registered, the balance of sounds registered over the whole spectrum of recorded frequencies, the stability of pitch that depends on stable rotating speeds, and the degree to which the sound registered in the grooves reflects the natural acoustic circumstances of a “live” performance.

Then come the results caused by the physical characteristics of the gramophone record and the techniques of sound reproduction. The characteristics of the material of the unplayed record determine several parameters:

1. The graininess of the material gives a hiss whose frequency will depend on the size of the grains - larger grains, lower frequency.
2. Imperfections and additives in the material may contribute a degree of snap, crackle, and pop noises.
3. The relatively heavy pressure exerted on the record by old gramophones damaged the material, depending on factors such as the weight of the arm, the condition of the needle point, the robustness of the material itself, and the amplitude of the waveform in the grooves.
4. Loud passages are always more vulnerable as they demand more compliance from the needle.

The needle damage thus generates:

1. The artefactual noise audible through the whole record, generally recognised as the scratchiness popularly associated with 78 rpm records.
2. The various kinds of noise recurring 78 times a minute caused by the damage made transversely over several grooves by a needle being jolted, or by other sharp or blunt objects.
3. A crack in the record also gives this latter effect.

As most people today have never heard how a previously unplayed 78 record in optimal condition can sound played on modern equipment, they have never heard a 78 whose sound is uncontaminated by anything else than the “pure” hiss of the material itself. Thus, here is what can be done to optimise our contemporary experience of music recorded on 78 rpm discs:

1. See to it that you have equipment - turntable, arm, pick-up, styli, preamplifier - that can do all of stages 2-5 properly.
2. Find the best possible copy of the disc.
3. Find the most advantageous stylus dimensions in order to optimise information retrieval and minimise unnecessary groove noise information - for example, by avoiding having a stylus that picks up signals from the debris at the bottom of the groove.
4. If possible decide on correct turntable speed, which will not necessarily be exactly 78.26 rpm. Pitch standards have varied in time and place, and even into the 1950s it is not possible to rely on cutting turntables maintaining standard speed.

5. Decide on the most suitable roll-off and turnover settings, and transcribe the disc to a suitable storage medium without any further modification of the information, such as filtering.
6. Once the information has landed from the original 78 rpm disc into an analogue or digital medium, the further work of restoring and/or conserving can begin.
7. Modern digital technology offers dangerously seductive tools for dealing with snap, crackle, and pop, scratches, hiss, and rumble. With the very costly Computer Enhanced Digital Audio Restoration (CEDAR) technology for example, this is done in a set order. First, the distinct clicks are removed by the declipping function. This does not affect anything but the very milliseconds where the clicks are removed. Next, the general scratchiness which pervades the side in question is processed. To do this it is necessary to feed the programme a sample of surface noise without music on the particular disc - for example from the lead-in groove or even from a brief pause during the performance. Finally, the amount of residual surface hiss can be carefully reduced, paying careful attention to the upper partials of the musical sounds. Given that this often catastrophically misused arsenal has had the chance to do its job well, the musical sound(s) can often be improved by the judicious use of equalisation; this work presupposes, as I said before, musical knowledge. Removal of high frequencies by excessive hiss reduction removes both upper partials and the experience of the air around the recordings. Injudicious treatment of lower frequencies may remove body and depth.
8. Finally, as has been done by very few, notably and brilliantly by the late Robert Parker (*Jazz Classics in Stereo*, LPs and CDs released from the 1980s until his death in 2004), it is possible to recreate an ambience, a feeling of a live acoustic, by the further use of analogue and digital methods of sound processing.

Working with used discs or archive material is naturally not quite the same thing, and has mostly been done by different people. Some of the best work with 78 rpm material has been achieved by people who have worked independently in their own studios rather than for the large companies. They have worked with personally chosen equipment, which they have perhaps designed and built themselves. They have preferably had the discs in their hands, the axiomatic principle being to begin by achieving the most faithful transfer possible, with no manipulation whatsoever. This can take days for one side, irrespective of how worn a disc is or isn't; as J. R. T. Davies said - the choice of stylus dimensions may be a tantalisingly difficult balance between surface noise and brilliance. As far as I have understood, these "masters of mastering" usually have not been the ones to get to do the engineering of pristine archive materials. Ergo, the engineers who do archive transfers for the large companies are usually not the same people who have spent years and years doing this and really know and care about what they're doing. Record company engineers are further hampered by being at the mercy of local praxis and the equipment available at the archive itself.

The difference in musical communicativity between various masterings is, at least to me, a very concrete matter. I have thought of it like this: the actual sound - on absolutely any sound recording - can be approached, separately or simultaneously, according to at least two quite distinct paradigms, which I will call "C and A" (cognitive contra affective).

On the one hand, the sounds can be listened to as the remains, or hard evidence, of an audible event. One might, for example, be quite happy to be able to use the recording to transcribe the musical events into a suitable musical notation, and consider that the recording has thus filled its purpose. It might be considered sufficient, according to this way of thinking, that one can somehow identify by category all the instruments and voices that were present during this audio event - here's a clarinet, here's a soprano voice, etc. It might be sufficient to be able to hear whether the musicians are playing in tune and keeping time. This paradigm, which I call "C," does not concern itself with anything else than a limited group of purely cognitive modalities - conceptualising and identifying categories of sound source by using cues such as timbre, and identifying pitch, tempo, and rhythm.

The mode of listening which I call "A," on the other hand, takes a natural affective interest in further differentiated musical qualities of the event, in particular its ability to evoke initially non-verbal affective responses. It requires more information than that necessary to satisfy the "C" paradigm, and this information risks obliteration if the engineer follows a sound restoration ethos which concerns itself solely with "C".

There are in my opinion far too many examples of CD reissues that fall into the trap of limiting the goal to “C” and ignoring the very existence of “A”. Regarding all extraneous noise as disturbing artefact, and using digital processing to try and extirpate every single trace of snap, crackle, pop and hiss, the result may become a distant, dead, shrunken, autoclaved shadow of something that once was a potent communicative record of the audible actions of living breathing human beings.

A further consequence of this kind of mastering (believe me, it isn't rare) can be such a grave distortion of the original information, that it is actually impossible to identify the instruments present if there is no textual information available. Furthermore, if a listener has never heard the instruments in real life or on acceptable modern recordings, she or he will simply be duped into forming an incorrect notion of the sound of the instruments.

The sound in 78 rpm discs is both very fragile and very resilient. Its fragility is not only related to the physical fragility of the discs, but to the incredible sophisticated complexity of the human hearing apparatus, which can recreate so much living musical experience out of 78s when given the chance, but which can be paralysed when, in the search for illusory clinical purity, the sound is manipulated in a manner described above.

The conditions under which this CD set was made imposed some limitations on the above ideals. The Greek 78 rpm record market was naturally much smaller than contemporary markets for numerically larger audiences. Some records were pressed in very small series of perhaps only 200 copies. Furthermore, the particular kind of Greek records with which we are concerned here were probably not bought and played by customers with “state-of-the-art” gramophones, which means that the discs were perhaps subject to more wear and tear than they would have experienced in richer homes. They were often bought by *fonografitzides* - men who wandered the streets with a gramophone on a cart, playing the discs to customers for a small charge. When a disc was worn beyond usability it would be discarded and replaced. These circumstances constitute unfortunate constraints when one wants to achieve high-quality reissues of Greek 78 rpm material.

None of the discs reissued here are kept in Sweden, where Greek Rhapsody has been compiled, and where the initial audio restoration was carried out. All transfers from the original discs were thus made elsewhere, usually by the owners of the discs, who kindly provided me with raw transfers on CD-ROM or tape. Most of the discs are extremely rare, even rarer in good condition, while some are the only known copies. I have chosen to reissue many of them here despite their less than optimal condition, simply for their musical value. This means that some tracks have considerably more surface noise and audible wear than they would have in the best of possible worlds. As far as possible we have followed the principles which I have expounded in the foregoing pages, choosing to give priority to the preservation of those details of musical sound which are essential to a truly musical experience, rather than to minimising the various kinds of surface noise which surround this precious music.