The Fickleness of Fidelity

It would be hard to devise a more apposite illustration of Marshall McCluhan's renowned aphorism *"the medium is the message*" than the 20th Century neologism *hi-fi.* For mid-Twentieth-Century consumers this diminutive of high-fidelity signified, more than anything else, a collection of consumer electronic goods designed for the purpose of replaying audio recordings; **the medium –** of electronic equipment – very cleverly and succinctly thereby incorporating **the message** – of high-fidelity audio reproduction.[1]

The question; to what should an audio recording be faithful, seems at first to be one to which the answer is self-evident. Clearly it should be faithful to its source; to whatever is being recorded. But there's an important distinction to be made: is the objective the faithful reproduction of a musical performance, or the faithful reproduction of the electrical audio signal generated by the recording equipment that is itself representative of that performance? And is the former proposition necessarily inherent in the latter? That's to say, do technical developments in those areas of audio recording and reproduction that are objectively quantifiable necessarily lead to greater audio realism?

To have arrived at the point where the electronic means of reproduction assumed equivalence with the more abstract notion of high-fidelity reproduction as it had by the 1950's was remarkable enough given the relatively short life of the recording industry: that it was achieved by means of the subtle elision of two very different concepts and that it seems to have endured, largely unchallenged ever since, indicates, apart from anything else, a piece of remarkably long-legged marketing on the part of the record industry.

To get to the origin of the fidelity myth we need to roll back to the earliest days of recording. Even though the term 'high fidelity' wasn't widely used before the mid-30's frequent references to the 'fidelity' of much earlier equipment reaching back at least to the first decade of the 20th-Century are to be found in contemporary publicity. Thomas Edison was himself one of the first to extol the fidelity of recorded sound. His company's house magazine,The Edison Phonograph Monthly, is spattered with references to the fidelity of the various Edison phonographs from as early as 1906, each instance preceded by some flattering adjective such as incomparable, wonderful, marvelous, absolute and even perfect[2]. The same trade journal also reproduces a contemporary Chicago newspaper article relating the apparent faithful reproduction of a dead woman's voice under the intriguing headline "Sang at her own funeral":

> *"The voice of the dead was heard at the funeral of Miss Minnie Nelson...Three weeks ago she sang 'Nearer, My God, to Thee' into a Phonograph and every tone of her beautiful soprano voice was reproduced in the Phonograph at her funeral,...[A]ll present were amazed at the fidelity of the reproduction of every tone in the singer's voice."*[3]

Given that the Edison Phonograph was an acoustic recorder/reproducer rather than an electrical device it's reasonable to interpret the term fidelity, in this context at least, as fidelity to its real, living counterpart in the acoustic world; what we might call audio realism. Indeed, Edison's famous Tone Tests, where Edison artists – usually singers – set out to convince the phonograph-buying public that Edison's diamond disc recordings were sonically indistinguishable from live performances by performing on stage alongside a Phonograph reproduction of their own recorded performances. This astonishing marketing

coup is widely recognised as having been remarkably effective. Yet today we cannot avoid treating such claims with sage circumspection. There's evidence to suggest that certain singers admitted learning to imitate the sound of their records but even so, to believe that anyone could really find it impossible to distinguish a real, live singer from a pre-First World War recording stretches contemporary credulity.

So how can the success of the Tone Tests be explained? Either the surviving reports are unreliable evidence and just so much hyperbole, or today's public is much less naïve than was Edison's. While Emily Thompson does present some evidence to support the former claim, it's too easy simply to dismiss our antecedents as gullible, inexperienced or less refined than ourselves[4]. But there remains a third possibility to consider: perhaps the Tone Tests were indeed more convincing than we today are willing to credit.

The performer would stand beside the Edison phonograph, which at a height of 4' 3" (143cm), was sometimes of comparable stature. Often, a stage set was constructed to give the impression of the experiment taking place within an elegant middle class drawing room, furnished no doubt, in a style to which potential customers might aspire. With the house lights dimmed, the 'concert' would begin with the artist performing to the accompaniment of their phonograph record. From time to time the performer would mime or stop singing altogether. On other occasions the lights would be extinguished during the performance so that the performer could leave the stage entirely in order to fill the audience with wonder and awe when the lights went up once again to reveal the phonograph playing and the artist disappeared.

What there could not have been though was any cessation in the phonograph's reproduction during a performance. The artist's rendition would therefore have been heard simultaneously with, or superimposed upon the sound of the phonograph. In other words, although the phonograph was from time to time heard alone the artist could have been heard only with the Phonograph's accompaniment. This might not make for a satisfactorily controlled experiment by modern standards but it did play nicely in Edison's favour. The phonograph of the day for all its failings was not wanting in loudness. Providing the performer was able to match his or her volume to that of the phonograph the audience would perceive a comparatively consistent sound characteristic. Moreover, the capacious acoustics in which Tone Tests often took place would further serve to blend and characterise the voices of the singer and the phonograph alike.

Given that we are all instinctually sensible to the subtlest cues of mood and tonal inflection in each others' voices, even under the most adverse conditions, listeners to Edison's demonstration would unconsciously have conflated the Phonograph's rendition with that of the live performer. Any perceived loss of clarity, depth or volume in the sound of the Phonograph when the performer fell silent being immediately and unwittingly supplemented by the listener's innate human instincts. To put it another way; the performance characteristics that continued unabated would have been rather more persuasive of the impression that the artist had not ceased than any loss in fidelity would have been to the contrary. As Rabinowitz and Reise explain:

> *" the ways human brains process what they hear, really do change with technology. Listeners deal with the 'same' stimuli in different ways, depending on the context in which that information is received;*

and at any given time in the twentieth century, listeners appear to dwell less on the differences between live sound and up-to-date recordings than on their areas of overlap."[5]

The experience, especially for someone who had never before heard a phonograph, might well have been extraordinarily and astonishingly convincing. Accordingly, it is at least credible that the Phonograph's reproduction seemed to a contemporary witness a facsimile of the musician's performance: not because credulous listeners were duped, but because Edwardian listening praxes were paradigmatically different to our own.

The introduction of the microphone and electrical recording in the mid 1920s cast new and brighter light on the concept of audio fidelity even though the primary aim, in classical music recording at least, apparently remained unchanged; to re-create for the listener, the sonic experience of the real musical event. Fundamental problems that had beset acoustic recording, such as the difficulty of capturing low-frequency and low amplitude sound, were readily and effectively resolved by the newer technology. Musicians were no longer obliged to crowd around the recording horn or to supplement soft-toned string instruments with more heavyweight wind or brass. On the whole, recording sessions became less of a circus and more like the traditional concert performance.

Importantly though, electrical recording also facilitated the demarcation and measurement of many aspects of sound recording. Amplitude could be measured and controlled; tonal characteristics could be altered or equalised and the new recording equipment could be finely calibrated. In short, what had formerly been a mechanical craft passed into the realm of scientific enterprise. In turn, the pursuit of audio fidelity which, until now had been a turbulent voyage of subjective exploration, would become a quantifiable, objective, linearly progressive quest.

Sleekness, efficiency and calculated exactitude were characteristic of the positivist modernity emerging after the First World War. The rapid creation of mechanised industrial production, the rise of the automobile and aeroplane as much as the scientific discoveries of the newly accredited Nobel Prizewinners fostered an ethic of lineal progress through technological development. Science and progress became practically synonymous and were, it was predicted, to be mankind's salvation. In the words of H. G. Wells:

"...there is that growth of science, there is that increase of understanding, there is that accumulation of power....It goes on now with accumulating speed and widening scope, and on it I build my working conception of the course of life. Man, unconscious at first, begins now, in an individual here and an individual there, to realise his possibilities and dream of the greatness of his destiny. A new phase of history is near its beginning."[6]

The loudspeaker, amplifier and audio component manufacturer H. A. Hartley is believed to have been the originator of the term *high-fidelity* when he used it in 1927:

"to denote a type of sound reproduction that might be taken rather seriously by a music lover".[7]

Difficulties in defining this rather vague formulation proved little impediment to the growing popularity of the expression from the mid 1930's onwards. Nevertheless, it was almost half a century before the term's parameters were officially set out in 1973 by the *Deutsches Institut für Normung (DIN)* according to the purely technical characteristics of low noise and distortion, and accuracy of a wide frequency response.[8]

With the parameters and limitations of audio recording and reproduction defined according to established objective standards it became both less necessary and less possible for a listener to evaluate recorded sound subjectively; that's to say, to asses its verisimilitude by comparing it in their own mind to recalled real world acoustic experience. Indeed, the various parts of the audio industry have consistently discouraged such critical assessment by declaiming the obvious merit of each new product in advertisements and the media with such conviction and supported by such a plethora of technical data that the industry's assertions have always seemed as irrefutable as its authority.

Arriving at a succinct definition of *high-fidelity* by any other less abstruse technological route would have been inconceivable in a society whose convergent thinking fostered a reductive rather than agglomerative approach to analysis and research. But circumscribing the definition of *high-fidelity* within a technical description of the audio signal path abrogated awareness and impeded consideration of other, more subjective aspects of sensory perception that are less easily measured or expressed but which nonetheless, are significant features of a recording's capacity to sound lifelike. Such an exact formulation is predicated on the presumption that an audio signal unequivocally bears the capacity to reproduce all the salient features of a listening experience which, in turn, leads to the misapprehension that microphones behave in an identical manner to the human auditory system. Arnold Borgmann, paraphrasing Langdon Winner, describes such framing thus:

> "*The available techniques of measurement often determine what gets to be measured. This is a case of what he* [Langdon] *calls 'reverse adaptation'- the adjustment of human ends to match the character of available means."*[9]

Professional recording engineers, looking back, can surely recall the feeling of uncertainty and disquiet upon hearing over the control room loudspeakers the initial result of their first ever tentative attempts at deploying microphones. The sudden, shocking realization that capturing sound, in the manner that one perceives it, is a craft rather than simply the inevitable product of a nearby microphone. Since reproduced sound never really conveys the verisimilitude of what one actually hears while standing in front of performing musicians, the novice recording engineer learns – without it ever being taught – how to realign their perception of actuality to accord with the prevailing sonic paradigm. As Colin Symes explains:

> *"As distinct from hearing, listening is not a natural process but one that is socially constructed, produced through the powerful discourses associated with sound, such as those concerning the presentation of music. Stravinsky developed the epithet "phonographic" sound, in the absence of a more apposite one to describe the qualitative dimension of this discourse,"*[10]

Once an engineer has learned to listen *phonographically,* they can proceed to forge recorded sound accordingly.

So, one has to wonder; after a century of ostensible improvements in fidelity, how much nearer we are now to achieving the presumed objective of audio realism. And before we are tempted to assume the superiority of refined contemporary listeners presuming the manifest superiority of modern *hi-fi,* we

might consider whether we would be any more likely than Edison's audiences to differentiate a live performance from a contemporary recording. Success would perhaps depend upon the type of instrument or ensemble chosen; Edison generally favoured the voice or violin, instruments best captured by his pre-electrical recording technology. Our choice of instrument or ensemble would be similarly circumscribed, not because audio reproduction is technically flawed, or because we are unable to reproduce a significantly wide frequency spectrum or dynamic range, but because the objective itself has been superseded: fidelity to actuality is no longer the real objective of recording.

According to Symes, Compton Mackenzie, first editor of The Gramophone magazine, warned of this possibility in an editorial "Search for the Absolute" when he sought to draw:

> "*attention to an alarming tendency toward widening the hiatus between the actual sound of music and that of the gramophone. He noted with alarm the "gramophone Platonists," who wished to idealize sound and produce "a more perfect expression of music" than would ever be possible in the concert hall."*[11]

As Mackenzie perhaps foresaw, with continued exposure to developing audio technology and its associated media, listeners and practitioners alike, have come, not merely to understand idealised sonic representation as emblematic of unmediated acoustic sound, but to conflate it with actuality itself. Constant textual invocation in print advertising and the *Hi-Fi* magazines have reinforced and entrenched this perception. The more firmly embedded a stylisation becomes, the more difficult it is to recognise as such; the primacy and distinctiveness of actuality deliquescing as the idealisation is embraced.

So long as the signifiers of a particular idealisation are recognisable, actual verisimilitude is of diminished importance. Consider for example the sound of a symphony orchestra recording replayed over a telephone. Almost no listener would be in doubt as to what the recording represented notwithstanding severe limitations in dynamic range, replay level, frequency range, transient response or any other of the determinable characteristics that would naturally be associated with the faithful reproduction of orchestral sound. Appreciation of modern day recordings – perhaps most particularly orchestral recordings – depends on a cognisance and an intuitive understanding of certain ideological stylisations; stylisations to which, due to the ubiquity of recorded music, the modern listener has become inured.

The painter David Hockney sets out an analogous argument in his book Secret Knowledge to support his claim that painters' prodigious use of the lens and the *camera obscura* between the fifteenth and nineteenth centuries altered the way the western world sees the artistic representation of reality. He explains how:

> *"linear perspective (the vanishing point) and chiaroscuro – had come from studying optical projections of nature...The importance of the 'optical look' is in its influence on imagery – and that influence exists even in paintings by artists who have never seen, let alone used, optical projections. Once the look was established, no artist needed actually to see a projection in person – he had only to see the work of other artists who might have seen projections themselves."*

He goes on to assert:

> "*Once the optical look emerged, it simply got bigger and more dominant. It is used today more than ever – indeed it is now almost the only way we see the world. Photography, video, film and television are regarded as 'real'. This to me is a problem. I don't think the world looks like a photograph."*[12]

The fact is that few listeners are readily able to specify or in any way articulate particular aspects of sound that seem to them lifelike. Understandably, many find curiously abstract the idea of considering the character of sound independent of its source; for example, describing the characteristics of a concert hall acoustic without regard to the music heard performed therein. Listeners are habituated to the sound

world to which they are exposed, finding pleasure and comfort in the types of sound they hear most frequently, which these days is seldom the sound of truly acoustic music. Just as for Hockney:

> *"artists were not always seeing things in three-dimension space but two-dimensional images that influenced them more than spatial perceptions",*[13]

so we are directed, and our predilections informed, largely through exposure to recorded music in its myriad variety of stylisations.

In order to appreciate the full significance of this point it's necessary only to consider how adept we all are at adapting and how easily we make sense of what we perceive. Indeed, the expression *to make sense of* something is in itself indicative of this apparently instinctive trait. The human mind is quick to make presumptions based on limited sensory experience. It continually seeks to rationalise that which it perceives. The sociologist H. Stith Benett calls this phenomenon 'recording consciousness' describing it as a consequence of *"a society which is literally wired for sound."*[14] Greg Milner, in his book *Perfecting Sound Forever* quotes Edward Rothstein of the New York Times in saying:

> *"We all learn a 'language of recording' [so that when a recording is played], the listener translates, mapping the heard sounds into a real world, placing the distorted frequencies into a mouth or instrument, and reconstructing sound and its intention."*[15]

The human mind's ability to make sense of its perceptions depends upon learned responses to familiar experiences. Knowing what to listen for is integral to recognition. Furthermore, our experience goes a long way towards explaining our tastes. The personal aural experience of each of us is in a state of continual evolution; that's to say, change, if not necessarily progressive development.

Acoustic music may not be in abeyance as some fear but listening to it is an increasingly rare experience for many. As this already quiescent ability fades the character of our aural experience will surely change more dramatically and with greater rapidity. Neither *hi-fi* nor amplified music are ills to be cured but neither are they as transparently neutral as we so easily assume. They have transformed the way we experience and react to the world about us, often more powerfully and unobtrusively than the art they convey. For Marshall McLuhan:

> *"The hi-fi changeover was really for music what cubism had been for painting, and what symbolism had been for literature; namely, the acceptance of multiple facets and planes in a single experience."*[16]

It was a step away from reality and from realism; an abstraction, perhaps even a new art, but if so, one that has been thoroughly subsumed into the mainstream.

The enduring if limited appeal of early pre-electrical recordings meanwhile, is attributable to more than the simple antediluvian attraction of antiquities. The guileless humanity conveyed by these acoustic documents surely gives them a claim to fidelity at least as great as anything produced since. Musical artists approached the recording horn with an innocent naïveté, comparable to the way in which we see blank, quizzical faces peering out from early photographs at a time when folks had yet to learn to grin winningly for the camera. For these artists, power lay in their art; in their musical performance. The message of the medium itself, had yet to be discovered.

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