

Recorded Music and Re-recording Processes

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SOUND recordings in various forms have at long last achieved recognition as authentic auditory history. As early as 1888 recordings were made in London, on Edison's newly perfected business phonograph, of the voices of Prime Minister Gladstone, Sir Arthur Sullivan, Sir Cecil Raikes (Her Majesty's Postmaster General), and many other important Britons. A few years later J. E. Hough, President of the English Edison-Bell Co., knowing of the existence of many such recordings of the voices of important persons, made a determined effort to interest the British Museum in preserving such oral documents. Mr. Hough foresaw the future value of the documents that had been recorded and of the voices of other leaders yet to be recorded in those years of British supremacy.

In 1910 Hough wrote a letter to the editor of *Sound Wave and Talking Machine News*, from which I should like to quote:

Some few years ago, after the death of Mr. Gladstone, I made strenuous efforts with the authorities of the British Museum, offering to provide the institution with records made by any important personages, provided they would keep them as mementos. At that time . . . [it was also possible] . . . to have obtained a record from the Kaiser, King Edward (then Prince of Wales), and many other celebrities. . . . It is too tiresome and annoying to go through the details of efforts made, only to find they were all blocked by crass official hostility, without result, simply that it was "not a subject which could be entertained by the British Museum."

The conclusion seems inevitable that an old buckle from William the Conqueror's armour would be prized immensely, whilst an authentic reproduction of his voice would be of no earthly use

At that time the Edison-Bell Company were manufacturing indestructible records, and my offer was to deposit the original wax records for preservation and to make as many duplicated copies as the Museum desired in indestructible material so that they could be heard by applicants upon payment of a small fee, which I thought would have been sufficient to have borne the expenses of such an organization.

As small beginnings lead to important ends, I think it is a great pity that so little enterprise was shown by those in charge of this most magnificent institution; the time of which I am speaking is some 7 or 8 years ago, and during the interval so many men of eminence have passed away, of whom so precious a relic as that under discussion might have been retained in the possession of the nation, and amongst them that of the beloved monarch whose passage has excited such deep regret throughout the civilized world.

The author, professor emeritus of landscape architecture at Syracuse University, is Director of the Audio Archives, Syracuse University Libraries. The Thomas Alva Edison Foundation, Inc., has given the Archives a grant to perfect new methods of re-recording vertical cut cylinders and discs to tape, long playing discs, and other media. This paper was read at a session on the Archives of Music, Oct. 19, 1967, at the 31st annual meeting of the Society of American Archivists in Santa Fe, N. Mex.

. . . I am in possession of vocal records delivered in 1890, which might be considered priceless if they could be put to public use, for instance, three by Alfred Lord Tennyson, "The Charge of the Light Brigade," "Bury the Great Duke," and "Let the Tale Be Told," and Mr. Gladstone, March 15, 1890, "A message to the meeting in New York." I regret to say that this record has been so much used and worn as to be unintelligible. [Records of] Florence Nightingale, Prince Napoleon, H. M. Stanley, and Phineas T. Barnum . . . are merely venerated relics, and so far as any public use is made of them they might as well be buried in oblivion.

A few years ago a box of cylinder records, which had been sent to Edison from 1888 to 1890 by Col. George E. Gouraud, his London representative, was discovered on a shelf behind Edison's cot in his library in West Orange, N.J., by Katherine McGuirk, Archivist of the Edison National Historic Site. Robert G. Vincent, now of the National Voice Library at Michigan State University—who was, incidentally, the first to record the voice of Theodore Roosevelt—re-recorded some of these worn and deteriorating cylinders onto an LP documentary entitled "Hark, the Years," released about 1951 by Capitol Records. On this documentary were included the voices of Kenneth Landfrey, the bugler who sounded the call for the charge of the Light Brigade at Balaclava, Florence Nightingale, and P. T. Barnum. Other voices in the lot of cylinders not on the Capitol record include those of Robert Browning, Alfred Lord Tennyson, Sir Henry Irving, Sir Arthur Sullivan, Prince von Bismarck, and Emperor Franz Josef. About 10 cylinders had so deteriorated that they could not be identified.

At the Thomas Alva Edison Foundation Re-recording Laboratory at Syracuse University, we are planning to have another go at these records, with the assistance of the Edison National Historic Site. In 1952 the Edison Voice-Writer Division expert Huenlich put most of these on tape; and, working only with this tape, we have been able to recover something of the voice of Sir Arthur Sullivan, which I will reproduce for you shortly.

There is now an organization in England called the British Institute of Recorded Sound, which promises to do much to remedy past failures there. This is as it should be, for the English have been foremost in their love for the "Gramophone" and in the quest for high fidelity in sound reproduction systems.

This brings me to the core of our problem as creators and keepers of archives of recorded sound—the establishment of valid criteria of historic truth. As in the written word, the spoken voice conveys the literal message, but it also transmits at the same time subtle inflections, dramatic emphasis, and meaningful pauses or changes in tempo. In addition it forms a conception in the mind of the listener of the person speaking—one of life and vitality. How important it is, therefore, that the reproduction of the voice be realistic, its timbre and resonance truthful.

Strange as it may seem, by far the larger part of all spoken voice

and musical recordings in all forms is at all times quite unavailable to the public. In order to hear as much as one-half of all that has been recorded since 1888, which really marks the beginning, one would have to visit all the museums, libraries, and archives in the world with recorded sound collections, as well as the homes of numerous private collectors. The loss of the early, fragile, original wax cylinders, used before molding processes were developed in 1902, has been very great—probably 90 percent.

A majority of the popular disc records throughout the years also have been lost, for the manufacturers considered these as ephemera, rightly or not. Many early disc companies went out of business and often their entire catalogs were lost. Technological changes made many forms of records obsolete, and most companies quickly withdrew from their catalogs records that did not reproduce well on their contemporary equipment.

Actually, it is known that even the earliest recordings had much more sound in them than could be reproduced at the time they were put on the market. Year by year it has proved possible to get better sound from records made only a year or so previously. Improvement in sound retrieval is something that can go forward indefinitely, unlike improvement in other archival material such as books and historical documents.

Now we must get down to criteria for evaluating the improvement of sound reproduction from old recordings. Contrary to the prevalent impression, there were simpler and perhaps better means for judging the pure sound of a speaker's voice or of a vocal or instrumental solo performance in the acoustical recording era than we have today. Despite the raised eyebrows, I will state the reasons for this.

First, the objective of Thomas Alva Edison, and also of his early competitors, was to perfect a comparatively simple mechanism to the point where the reproduction from the record could be directly compared with the performance of the artists. The search for this goal is clearly revealed in the advertising slogan for the Edison Gold-Moulded cylinders issued first in 1902, "As loud and clear as the original."

Beginning in 1909 and continuing until 1912, Edison had a large crew of research chemists and technicians employed in a crash program to attain this objective of perfectly reproducing the human voice and musical instrumental sounds. The result was two new phonographs introduced in 1912, the Diamond Amberola, to play a series of longer playing celluloid cylinder records, and the Edison Diamond Disc phonograph and records. In 1915 the first publicly conducted direct comparison tone-tests were held. Opera singers Anna Case and Christine Miller were the first of many to participate. On April 28, 1916, Marie Rappold, dramatic soprano of the Metropolitan sang before an audience of 2,500 in Carnegie Hall in New York. Again the precision of voice

production attainable with the New Edison Phonograph was demonstrated. The music critic of the *New York Tribune* said ". . . Edison snares the sound of music," and the critic of the *New York Globe* described the instrument as "the phonograph with a soul."

To make a long story short, from 1914 to 1927 similar tone-tests were conducted in large and small halls and auditoriums from coast to coast. Edison newspaper and advertising budgets, however, were small in comparison with those of competitors, and the critics were subtly induced to ignore the tone-tests after this first flush of financially uninhibited and spontaneous enthusiasm for Mr. Edison's latest accomplishment. The artists who recorded for Edison, however, and for other companies have left us evidence by which we may re-record with proper respect for the true timbre of the voice or instrument, as revealed by a carefully adjusted Official Laboratory Model Edison disc phonograph.

The various recording processes had important common denominators, which are also of great assistance in recovering sound with maximum fidelity. All acoustically recorded records were cut with what is called constant velocity. For instance, in the recording of all Edison and other vertical process records the sound waves were incised into the wax blank, whether cylinder or disc, by a scoop-shaped sapphire cutter which left a vertical undulatory groove controlled only by the diaphragm that was directly actuated by the vibrations collected by a sound collecting horn. The acoustical lateral discs such as those of Victor and Columbia also were cut by a similar constant velocity system. There was no way to favor one frequency or one band of frequencies over another, as is presently the practice with electrical recording methods; hence it is comparatively simple to reconstruct the method of cutting so as to provide a quite completely inverse system for optimum accuracy in reproducing.

Another factor in the often magical recovery of a good quality of sound from early records was the large amount of solo voice energy or solo instrument energy affecting the cutter, for the performer was placed directly in front of the sound collecting horn, with other horns for accompanying artists. The result might be compared to the over-close microphoning to which many popular singers seem to be addicted at the present time. To get the best reproduction from either, space is needed to allow the undeveloped recorded sound to come out properly. We have learned how to provide for this.

The recording of larger ensembles and orchestras in the early days was made difficult by the lack of amplification. Today, we generally employ amplification too generously. A voice or instrument reproduced at a level higher than its original level is not the same voice or instrument. In the early days of recording music, including some of the reflected sound of the studio was difficult and uneven. In fact, for the

realization of the Edison goal of precise reproduction of vocal and instrumental music, it was necessary to exclude reflected sounds. Obviously it is impossible to put on a tone-test in which the recorded voice is mingled with reverberant echoes from another room!

When the Bell engineers, Maxfield and Harrison, introduced electrical recording in 1925, the goals of recording engineers of the companies licensed to use this system were drastically changed. The listener was now to be transported, in effect, into the recording studio, or into the symphony hall, whichever was most appropriate.

Maxfield and Harrison described the effect sought as that of having the apparent auditorium or recording studio added onto the living room of the listener. Therefore, sound recording has since become largely the business of creating the illusion of reality, rather than providing an exact re-creation of the original performance. If motion pictures of the silent era may be regarded as documents, however, sound recordings are definitely not more illusory. Motion pictures and television depend upon the phenomena of the persistence of vision. Electrical sound recording utilizes reflected sound, multiple microphones, mixers, and filtering and equalization techniques to provide a realistic effect of a musical performance in a proper space.

As of July 1, 1967, Electrical Musical Industries, Ltd., of England stopped producing classical monophonic records. Others in England and the United States are following this example. Stereophonic recording involves the use of dual track recording and playback systems. Unfortunately, the promotion of stereo discs a decade ago was premised upon effects of directionality. This is the factor of least importance in the field of music recording. Much more important are the subtle phase shifts which occur when the sound is introduced into the listening room—a feature of listening to live sound when coming from a variety of sources. For instance, these phase shifts occur in a solo with only a single accompaniment or a small ensemble, or even a pipe organ. These effects are more pronounced, of course, in the reproduction of symphonic music or grand opera.

An unexpected bonus to musicologists, music historians, and the many admirers of the great artists of the past is that stereo techniques may be applied to release the performers from the constrictive effects of the recording horn or the too close microphoning of the early electric recordings.

We do not call this method stereo, nor is it pseudo-stereo, for it is intended to bring only the obsolete types of recorded information into the listening context of the present. To have students properly appreciate the great voices and instrumental artists of the past it is not enough merely to update the quality of the reproduction, as far as possible, but also to make listening comfortable and enjoyable through modern reproducing equipment.