

The Rise and Fall of the New York Electric Music Company;

a Study in Early Musak, of the Wonderful Telharmonium

by Stoddard Lincoln

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My very ancient and venerable Father was a pioneer in electricity who worked in the early years of the century with such figures as ~~Thomas Edison,~~ <sup>Edward Weston, Charles Steinmetz, T. Edison,</sup> ~~Weston,~~ and <sup>Frank</sup> Sprague. His work was, in fact, so early that when he was forced by government regulation to obtain an electrical engineer's liscence, he was examined by those very people to who<sup>m</sup> he had previously issued liscences. Although most of his contimporaries have passed away, my Father, one Edwin Stoddard Lincoln, is still practising on a consultant basis but devote<sup>d</sup> most of his time to collecting and setting up historical museums and exhibits.

Now several years ago my Father initiated the practise of sending me all manner of flora and fauna, such as clippings, brochures, games, and baby pictures intended to embarrass me when seen by my colleagues. About a year ago, while

searching for some notes on a completely different subject,  
I came across this disreputable heap and, in sorting it out,  
I discovered that I had in my possession several fascinating  
documents about the Telharmonium, an extraordinary electrical  
instrument invented by Thaddeus Cahill. I relate these facts  
to you not only as a tribute to my Father, but also so that  
you will realize how I, a harpsichordist and baroque specialist,  
have wandered into the twentieth Century. It was purely filial  
devotion, utter madness, and, of course, a bit of curiosity  
that prompted me to ferret out the pieces of this <sup>peculiar</sup>~~curious~~  
history and to assemble them before you at this time.

The first item I received <sup>from my Father,</sup> was an invitation  
addressed to William Hammer to attend the first public demon-  
stration of the telharmonium.

Slide 1

*incidentally, was*  
 Hammer, also an early engineer, was one of the great collectors whose holdings ~~are now~~ <sup>were</sup> partly owned by my father and partly by the Smithsonian Institut<sup>e</sup> in Washington.

Thaddeus Cahill, the inventor <sup>of</sup> the telharmonium, had lived in Oberlin before the turn of the century and was especially devoted to music.<sup>1</sup> He complained, however, that there was no such thing as a perfect musical instrument. The violin could not play chords very well, the tone of the piano diminished after it was played. The organ, he said, was a "dead instrument" because the player had no control over the sound once his finger had depressed the key. His aim in life, then, became to create the perfect musical instrument and to do this by electrical means.<sup>2</sup> By 1900 the basic instrument had been conceived and set up in his studio in Holyoke, Massachussetts. The machine was then transported

to, and set up in Washington, D. C., where such people as Lord Kelvin encouraged Cahill to perfect it further. Also in Washington, two capitolists, O. T. Crosby, a pioneer in electric railroading, and F. C. Todd, became interested in the commercial possibilities of this wonderful machine. After four more years of hard work in Holyoke, ~~finally the perfected~~<sup>when then</sup> the instrument was finally perfected, and in 1906 ~~2000000.000~~<sup>some</sup> worth of machinery weighing <sup>some</sup> twenty tons was installed at 1414 Broadway in a building which stands opposite the <sup>old</sup> Metropolitan Opera House on the corner of 39th Street.

Perhaps the best way to describe this musical monster will be to trace Mr Hammer's footsteps on the 11th of January, 1906, when he entered Telharmonic Hall, as the place was so grandly named.

Slide 2

the  
Done in a pre-Lady Mendel tradition, the potted

palms and the central pouf not only added to the elegance of the chamber, but also cleverly concealed the instrument's tiny loud<sup>d</sup> speakers. A closer inspection of the console reveals a piano keyboard replete with all manner of levers and stops used to control the volume and timbre of each note.

Slide 3

The keys were, actually, simply electrical switches.

Before the program began, the select audience was invited to descend into the basement and view the machinery. The first sight was that of the main switchboard and tone mixers.

Slide 4

The electrical current, which eventually resulted in the actual sound of the instrument, was produced by 145 alternating current dynamos.

Slide 5

The magnetic field and armature coils of the dynamos were stationary. The rotors, mounted on a single massive rod which was operated by a 100 horse power direct current motor, revolved at different speeds which were governed by means of a complex series of gears and teeth. Each dynamo, therefore, produced an electrical current which alternated, or vibrated, at the frequency of the pitch desired. 84 of these dynamos produced the fundamental pitches, and 61 others were used to produce the upper partials which, when blended with the fundamental notes, produced the desired timbre. The currents so produced were then blended and refined in a series of transformers called the "tone mixers."

Slide 6

So far no music has emerged but only a single electrical current, such as ~~is~~<sup>is</sup> sent over a telephone wire.

The final step was comparatively simple: the wire was attached to a telephone receiver and the sound was amplified by means of a paper cone.<sup>3</sup>

The telharmonium used for ~~this~~ its initial demonstrations was admittedly limited in the number of overtones it could produce and <sup>it</sup> fell far short of fulfilling its claim of sounding like an orchestra. It was Cahill's hope, however, to add many more dynamos in order to ~~make~~ compensate for these deficiencies. The inventor also realized that in order to create the different choirs of the orchestra, that he would have to have more than one ~~keyboard~~ <sup>console</sup> at his disposal. <sup>Therefore,</sup> During the course of the following year, he added a second ~~keyboard~~ <sup>console</sup>, but his ultimate aim was to have four: one each for strings, woodwinds, brass and percussion.<sup>4</sup>

slide 7

When Mr. Hammer finally arose from the lower depths of 1414 Broadway and re-entered Telharmonic Hall, he was regaled with the order of events listed in the left hand

column of this program.

Slide 8

The right hand column lists two programs which were to be offered to future subscribers of this new music. Light classics would seem to be the order of the day.

We must now shift our focus from the telharmonium itself to the activities of those two capitolists, O. T. Crosby and F. C. Todd, whom Cahill had met in Washington. To them, the salient feature of the telharmonium was not so much its musical possibilities as ~~the fact~~ it was the fact that music could be distributed to consumers over wires. Like the wires of the telephone, they could be stretched for great distances and music <sup>into</sup> could be piped into home, church, and theatre. What they envisioned was, in fact, early musak; but with one difference. It could be turned on and off at the will of the subscriber.



In order to achieve this purpose, the New York Electrical Music Company was organized in 1904, during the years <sup>in which</sup> ~~that~~ Cahill was perfecting his invention and two years before the ~~demonstrated~~ demonstration model was installed in New York City. Crosby became the president of this outfit and Todd the vice-president. \$ 600,000.00 worth of stock was authorized of which 426, 000.00 was issued. In order to raise more money for moving the device to New York, the newly founded company issued more capitol stock and attempted to entice more investors with a little booklet which describes their plans in iced detail.<sup>5</sup> Having secured the complete rights to the telharmonium, subway rights in New York City, and exclusive rights for the entire state, <sup>of NY</sup> the first step would be to set up the demonstration instrument just described. They then proposed to establish subsidiary companies in Buffalo, Rochester, Syracuse, Albany, and Newberg.<sup>6</sup>

But first they concentrated on New York City itself, and of extreme interest is the company's detailed appraisal of the music market for public and semi-public places. Using the Musical Courier as their guide, the board of directors estimated that there were 25,000 musicians active in Greater New York. Each received an estimated \$ 5.00 a day for 300 days a year which meant that <sup>mil three</sup> \$ 37,500,000.00 was paid annually for live music. Calculating that coin-operated automatic pianos, orchestrions, banjos, etc., earned about <sup>mil three hun</sup> \$ 1.00 a day, they estimated an income of \$ 1,075,600.00.

Nor were the record sales of the Victor Talking Machine Company omitted: their sales in 1905 alone amounted to <sup>mil four hda.</sup> \$ 7,5000,000.00.

In their brochure, the New York Electric Music Company sincerely hopes that they will not replace live musicians, especially those who have brought their art to a state of perfection, but that these figures are presented merely to indicate the amount of money spent on music each year.

Next, the prospective investor is assured that the following types of institutions will subscribe to the music of the Company: restaurants, saloons, hotels, churches, schools, hospitals, theatres, boarding houses, doctor's and dentist's offices, barbershops, and at least 624,000 private home owners including apartments. In conclusion, this little pamphlet all but guarantees the stockholder annual dividends of several hundred percent and modestly points out, "these figures suggest a profit so enormous that there is a natural inclination to doubt them. However, when it is considered that the Company occupies toward the Telharmonic art the same relation that the original Bell Telephone Company occupied towards the art of the telephone, and when the known results to the stockholders of the original Bell Company are borne in mind, it would seem that these figures are not really extravagant."

Besides raising money for this lucrative enterprise, Mr. Crosby addressed himself to the problem of how to distribute his product. It was only logical that he should approach the American Telephone and Telegraph Company as they commanded a network of wires which, with proper arrangements, should be able to carry music as well as the human voice. After delicate negotiations ~~between the two companies a contract was drawn up in April of 1905~~ ~~between A. T. & T.~~ between Frederick Fish, the president of A T & T and Mr Crosby, a contract was drawn up between the two companies which allowed the New York Electric Music Company to draw wires through A T & T's existing conduits. When Cahill heard of this arrangement, he became suspicious of the whole deal and insisted that the music company should have a franchise of its own rather than a contract to use another company's franchise. He questioned the legality of such a contract and pointed out that for such a large investment the music company should not be dependant on a contract with

another company.<sup>7</sup> Despite these objections, Crosby's company, as we may well call it by now, proceeded to lay its cables and by the first month in 1907, the new Music was available to subscribers from 23rd St. up Broadway to 45th St. and up Fifth Avenue to 34th Street.<sup>8</sup>

Also by 1907, Cahill's thoughts about an independant franchise were taken seriously. Judging from the fact that on May 10th, 1907, the New York Electrical Music Company applied for corporation, and that two days later it applied for a franchise to lay its own wires,<sup>9</sup> one gets the impression ~~feeling~~ that Crosby felt the necessity of putting his enterprise on a more legal basis <sup>rather</sup> than on relying on a contract ~~with~~ <sup>to use the</sup> franchise A T & T, and counting on their sustained good will.

The first application caused no difficulty, but the second, according to the results of the investigation conducted by the board of Franchise,<sup>10</sup> presented certain peculiarities which made it difficult to establish a ~~few~~.

The 'peculiarities' are succinctly stated in the report:

The commodity being sold is "a luxury, not a necessity as is the telephone." it is "a method of amusement...Income will depend entirely upon the approval of the public of that class of entertainment rather than upon any degree of necessity for the product caused by having a commercial value, as, for instance, telephones, railways, electric lights, gas, etc."

Before stating the terms of the franchise, the grantors shake their puzzled heads and conclude with the observation that "never has there been such a request. How can they [The New York Electric Music Company] estimate the cost of the 'greatest masters'?"

In the detailed franchise which follows, <sup>the report</sup> one learns that the music company was granted the right to construct 4,000 outlets over the following three years. They were given the right to use existing public subways in Manhattan, the Bronx,

and that "portion of Brooklyn known as Coney Island."

Free services , as was the custom, were to be offered to churches and possibly to schools. The fee would be a minimal \$2,500.00 per annum.

The report of the franchise, which was published in Engineering News (11 February, 1909) is the last event to be reported ~~on~~ <sup>concerning</sup> the activities of the New York Electric Music Company in the ~~engineering periodicals~~ <sup>periodicals of the day</sup>. From that time until the present, all references to the telharmonium are short, vague, inaccurate, and extremely confusing.<sup>11</sup>

The fate of the telharmonium, however, is easily conjectured when one reads the various letters to Mr. Frederick Fish, the President of A T & T, concerning the transactions of the New York Electric Music Company. One gathers that the activities of the music company were hampering those of the Telephone Co.

For example, in order to save Dr. Cahill the tremendous job of building all of the switches and electrical connections, Crosby applied to <sup>the</sup> Western Electric <sup>Co.</sup> who declared that they had all of the orders they could possibly manage from the expanding telephone company. The same situation was found to be the case with General Electric <sup>Co.</sup> when Crosby approached them about constructing the dynamos.<sup>12</sup>

¶ The last letter in A T & T's files concerning the telharmonium must be considered as the kiss of death to the art of telharmony.<sup>13</sup> The circumstances of the letter are best described in the words of its writer, Hammond V. Hayes, the chief engineer for A T & T. "On April 1st [1907] you handed me a letter from Mr. Crosby of the New York Electrical Music Company in which the suggestion was made that the Western Electric Company undertake the manufacture of a portion of the apparatus employed by his company. You asked me to look into the question and let you know whether I could see any possibility of his device, the "Telharmonium", being employed



advantageously to us as an adjunct to our telephone system."

Although Mr. Hayes, as an engineer, had nothing but admiration for Cahill's ingenuity, he had grave doubts as to whether or not the telharmonium would ever become more than a novelty. I quote from Mr. Hayes' letter extensively because in his discussion of this point, he gives us the only detailed description of the actual sound of the instrument that has come down to us.

"Competent opinion as to the quality of the music can be formed only by one who is especially trained as a musician. My own judgment of this music was that it was remarkable for the purity of the tones transmitted, but I failed to see the similarity of the tones to those of the musical instruments which they were <sup>d</sup>designed to represent. Much less could I see that the music approached that which is obtained by an orchestra. In the selections which I heard, attempts were made to reproduce flute, oboe, tuba, violin-cello, french horn and clarinet, but ~~I question whether I should have recognized in the electrical~~

I question whether I should have recognized in the electrical music the quality of the various instruments, had I not been told that it was those instruments the reproduction of which was attempted. I am inclined to believe that many overtones now missing from the present apparatus will be required before the quality of orchestral instruments can be attained."

"Whether or not it will be possible to obtain a complete orchestral effect cannot be determined. My belief is, however, that an enormous amount of work and great complexity in apparatus must be made before such results are possible. On this portion of the subject I can say that I should not consider the music which I heard would in any way replace for commercial purposes the music now ordinarily furnished by orchestras, although the marvellousness and novelty of it will, of course, appeal to the public for some time to come."

Mr. Hayes continues by pointing out the enormous expense of perfecting what he refers to as an experiment and also fears that an independent circuit of special wires must be created. It is most important to remember that the Music company had a franchise to <sup>use</sup> ~~use~~ existing subways, and they were, of course, those of the telephone company. What Mr Hayes feared most was induction between the pallel cables of the two companies, a factor which would make it impossible for either enterprise to continue.

Mr. Hayes concludes his letter be stating that there is yet so much to be done in simplifying and perfecting the apparatus of the growing telephone company that he does not see his way clear to reccommending that they take up the difficult problems of electrical music. And so, it seems, the ambitions of the New York Electrical Company came to nought. Thaddeus Cahill's initial fears concerning the use of the telephone company's equipment were all too true. He had been

an electrical Cassandra.

We must also consider the development of the radio during these same years, a consideration which leads one to the conclusion that the telharmonium was doomed by its sheer bulk. Lee DeForrest had begun his first experiments with the wireless telephone in 1907. In 1910 there had been an experimental broadcast from the Metropolitan Opera House of Cavalleria Rusticana and Pagliacci with no less a celebrity than Enrico Caruso.<sup>14</sup> Certainly no mechanical device, no matter how ingenious, ~~was~~<sup>could</sup> compete with live sound, and it was also soon realized that a vacuum tube was lighter than a dynamo, and that wireless transmission was less hard on the streets of New York City than digging conduits. Nonetheless, we must salute Dr. Cahill's invention as a wonder and grant it the honor of being the father of all electric musical instruments.

In closing, one cannot help but wondering what electronic music would be like today if the telharmonium

had fallen into the hands of a composer rather than into the hands of those two capitalists, O. T. Crosby and F. C. Todd.

It is interesting to note that Ferruccio Busoni received an invitation from Dr. Cahill to hear the instrument. Although Busoni was unable to hear the instrument himself, he received a

first hand accounts of its In his A New Esthetic of Music, ~~14~~ 15

published a year after the telharmonium made its New York

debut, Busoni states that the instrument had infinite

potential in solving the problems of creating the new scales

which he proposed in that work. But, Alas, Busoni and his ilk

never seem to have gotten ahold of the telharmonium. Thus

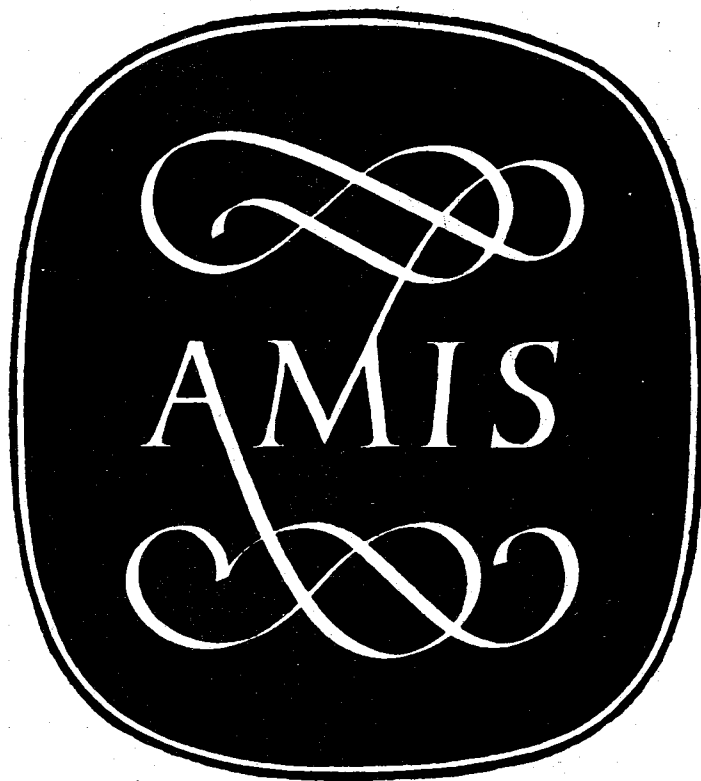
the story of the telharmonium is <sup>really</sup> not so much a study of the

beginnings of creative electronic <sup>composition</sup> ~~music~~ as it is the saga

of the rise and fall of the New York Electric Music Company,

an attempt at early musak.

- ① McClure's Magazine, July 1906
- ② Various other patents - Lorkwood to Fish 17 April 1907  
(Thank AT&T)
- ③ Electrical World, March 10, 1906
- ④ McAllister, Electrical World 1907.
- ⑤ The New York Electric Company, an advertising brochure for prospective stockholders [1906]
- ⑥ Crosby to Fish 16 Dec 1904. Fish, Pres of AT&T. Crosby suggests New York (which he prefers) or Boston. For this reason some articles on the subject refer to the New England Electric Music Company. Eventually AT&T decided on New York.
- ⑦ Crosby to Fish, 27 Jan, 1907
- ⑧ McAllister, op cit
- ⑨ Engineering News Vol 61 (Feb 11/1909) 146-9.
- ⑩ Ibid
- ⑪ Stonimsky confusion with Dynaphone
- ⑫ Crosby to Fish, 8 March 1907
- ⑬ Hauger to Fish 12 April 1907
- ⑭ Swowitch survey.
- ⑮ Busoni + Varese
- ⑯ 1909 p. Dover reprint



**NEW YORK CITY**

**APRIL 5-6, 1975**

# AMERICAN MUSICAL INSTRUMENT SOCIETY NATIONAL MEETING

## NEW YORK CITY, APRIL 5-6, 1975

**Saturday, April 5** Room 220, Waverly Building, New York University, 24 Waverly Place

8:30 AM—Registration

9:00 AM—Welcoming address—James Haar (Chairman, Department of Music, New York University).

Performance by the New York University Collegium Musicum (Kay Jaffee, director), using instruments from the Noah Greenberg Collection of Musical Instruments. Music of Wilbye, Phillips, Johnson, Byrd, and Holborne.

AMERICAN INSTRUMENTS—Victor Fell Yellin (New York University), Chairman

Eric Selch (New York), "Yankee Bass Viol Makers—A Preliminary Study"

David W. Hinshaw (El Paso), "Four Centuries of Mexican Organ Building"

✓ Stoddard Lincoln (Brooklyn College), "The Telharmonium—A Study in Early Muzak"

HISTORICAL WIND INSTRUMENTS—Howard M. Brown (University of Chicago), Chairman

Bob Marvin (Woburn, Quebec), "Two Bases of Verona"

Shelly Gruskin (Tomkins Cove, N. Y.), "The Musette—An Aristocratic Bagpipe"

12:15-2:00 PM—Lunch on your own.

2:00 PM—Performance on the EEb Contrabass Sarrusophone by Douglas Koepp (Silver Spring, Md.) assisted by Kathryn John (New York University). Music of Offenbach.

19th-CENTURY INSTRUMENTS—Cynthia Hoover (Smithsonian Institution), Chairman

William J. Maynard (Massapequa Park, N.Y.), "Clarinet Patents—Attempting to Eliminate the 'Break'"

Barbara Owen (Rockport, Mass.), "The French Harmonium"

Robert E. Eliason (Henry Ford Museum) and Robert Sheldon (Smithsonian Institution), "The History and Sound of the Quinticlavé and the Ophicleide"

Performance on the conical Boehm flute and harpsichord by Daniel Waitzman (Flushing, N. Y.) and Eugenia Earle (New York). Music of C. P. E. Bach and Giovanni Picchi.

MIXED TOPICS—Barbara Lambert (Museum of Fine Arts, Boston), Chairman

Mary Rasmussen (University of New Hampshire), "Musical Instruments in Still-Life Paintings of the 17th-20th centuries"

Harry Vas Dias (Decatur, Georgia) and Sally Logemann (New York), "The Baroque Oboe Reed"

6:00 PM—Top of the Park Restaurant, 5th Floor, Loeb Student Center, New York University, Washington Square South at LaGuardia Place.

Cash bar.

7:00 PM—Top of the Park Restaurant

Banquet. Pre-registrants only.

8:30 PM—Tishman Auditorium, Vanderbilt Hall, New York University, 40 Washington Square South

Concert of 18th-century chamber music played on historic instruments by the Amade Trio of Cornell University (Malcolm Bilson, fortepiano, Sonya Monosoff, baroque violin, and John Hsu, baroque cello) and the Stanesby Ensemble (Bernard Krainis, recorder, Nora Post, baroque oboe, Philip Levin, recorder and baroque bassoon and Edward Brewer, harpsichord). Music of Mozart, Beethoven, Loeillet, Vivaldi, and Telemann.