

Eleanor Selfridge-Field, "Experiments with Melody and Meter, or The Effects of Music: The Edison-Bingham Music Research," *The Musical Quarterly*, 81/2 (1997), pp. 291-310.



## Experiments with Melody and Meter, or The Effects of Music: The Edison- Bingham Music Research<sup>1</sup>

*Eleanor Selfridge-Field*

Among his 1,093 patents, Thomas Alva Edison (1847-1931) took the greatest personal pride, in his later years, in the invention of the phonograph. Between the invention of the tin-foil model in 1877 and the advent of the Diamond Disk in 1912, recording technology on both sides of the Atlantic had stumbled through a series of transitions. The Edison Phonograph Company, launched in 1888, had many progeny. Among the series of companies later formed under the same aegis, on the National Phonograph Company, started in 1892, endured until Edison's last years. (1)

The Edison recording enterprise, which was to press more than 30,000 titles by 1929, was run almost obsessively by the inventor. Through what might be called the "construction" of the purposes of phonography, its influence on perceptions of musical experience and on American musical aesthetics was profound. Edison's confidence in his own abilities to judge music was extreme, especially considering the fact that he had suffered from a serious hearing impairment from the age of 12.

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<sup>1</sup> Portions of this paper have been presented in talks given before the industrial affiliates of Stanford University (May 1994), at the annual meeting of the Society for Music Perception and Cognition (University of California at Berkeley, June 1995), and at Harvard University (April 1996). Responses from and inormqal discussion with Lola Cuddy, Carol Krumhansl, and Leonard Meyer have been especially helpful.

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At the outset, the phonograph was considered to be a medium for the dissemination of speech.<sup>2</sup> The phonograph could deliver public messages, take dictation, play recorded books for the blind, and serve as a vehicle for advertising.<sup>3</sup> Edison foresaw the phonograph as a potential instrument of educational reform. Through the bimonthly *Edison Magazine*, published during the first two decades of this century, many additional uses were suggested through testimonials. Among these were teaching languages by "correspondence"; giving speeches in absentia; assuaging loneliness on oceanic voyages and Arctic expeditions; and luring rabbits out of their holes by playing the recorded sounds of ferrets. The search for further uses of the phonograph was unending. It is within this context that the company's sponsorship of music research must be understood.

In 1920 the National Phonograph Company contracted with a young psychologist, Walter Van Dyke Bingham, to fund a series of experiments. The history of this collaboration is documented in the archives of the Edison National Historic Site in Orange, New Jersey. Predictably, the arrangement foundered on quarrels over purpose. Bingham's early intellectual inclination towards cognitive questions and Edison's practical interest in behavioral ones never entirely converged. Common ground was ostensibly found in a series of studies of "the effects of music." The main areas explored, during two years of experimentation, were topics described as (1) song selection research, (2) mood change research, and (3) the influences of music on muscular activity.

#### WALTER VAN DYKE BINGHAM

As an undergraduate at the University of Chicago from 1905 to 1907 and a graduate

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<sup>2</sup> In fact it was Edison's earlier invention of the microphone that made production of Bell's telephone, originally conceived as a hearing aid for his deaf sister, practical.

<sup>3</sup> John and Susan Edwards Havrith, *Edison, Musicians, and the Phonograph: A Century in Retrospect* (NY: Greenwood, c.1987), p. 1. In later years, Edison envisioned the phonograph as an audition tool for concert organizers, who would be able to choose the singers and the repertory that seemed best suited to their needs.

student of psychology at Harvard University in 1907-08, Bingham had been particularly interested in studies of melody. These studies appeared as a monograph supplement to *The Psychological Review* in 1910.<sup>4</sup> At the time of this publication, Bingham was an instructor in educational psychology at Teachers College, Columbia University. His studies are grouped into four parts but essentially concern two topics: (1) what Bingham calls "the melody problem" and (2) the effects of melodic "stimuli" on motor movement. Ultimately he was concerned with a cognitive question: Why do certain sequences of tones seem to cohere to achieve a sense of "melodic unity" while others do not?

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<sup>4</sup> Vol. XII, No. 3 (January 1910), pp. 1-88.

The "melody problem" is partly philosophical and partly psychological: Bingham wishes to determine "how a series of discrete tonal stimuli generate the experience of melodic unity." He explores pitch relationships and inflections of various kinds and introduces the concept of *melodic trend*, in which certain sequences of tones end more satisfactorily ("better") on the upper tone and others "better" on the lower tone.<sup>5</sup> He eventually brings his enquiry into the context of tonality, which he considers to be an "attitude" that is "probably motor at basis."<sup>6</sup>

\*31 His experimentation on "melodic stimuli" involved finger-tapping on a special piece of apparatus. He ascertained that rates of finger-tapping varied with the size and direction of melodic intervals. In a series of experiments he used progressively longer sequences of pitches. Auditory experiments involving the relationship of single tones to chords, foreshadowing the work of Carl Seashore and others, were also run. In conclusion Bingham compared motor phenomena of "melody" (by which he meant pitch sequences) and rhythm.<sup>7</sup> In this endeavor he mainly sought to find common ground between the two.

These excerpts give the flavor of his conclusions:

. . . a motor theory of melody makes possible an unambiguous statement of the nature of melodic "relationship." Two or more tones are felt to be "related" when there is [a] community of organized response . . . .

The origin of . . . feelings of "relationship" [may be attributed to] two main forces . . . . The first of these, the phenomenon of **consonance**, is native . . . . But although the basis for consonance inheres in the inborn structure of the nervous system and the acoustical properties of vibrating bodies, nevertheless it is a commonplace of musical history and observation that these same native tendencies are subject to tremendous modification in the course of experience . . . .

. . . the **associative** factor . . . is directly efficient in determining what tones shall

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<sup>5</sup> These questions are laid out in the first study. In the second, experimental results are presented and discussed.

<sup>6</sup> He then reformulates the original problem (p. 41).

<sup>7</sup> *Op. cit.*, p. 81.

be felt as "related," quite apart from any effects which it has upon judgments of consonance. Mere custom, mere habituation . . . results in a facility of recognition and response which is capable of generating these feelings of "relationship." . . . The "relationship" is . . . traceable to the motor phase of the process.

The **unity**, then, which marks the difference between a mere succession of discrete tonal stimuli and a melody, arises not from the tones themselves: it is contributed by the act of the listener . . . when, finally, the series of tones comes to such a close that what has been a continuous act of response is also brought to definite completion, the balanced muscular "resolution": [this] gives rise to the feeling of finality, and the series is recognized as a unity, a whole, a melody.<sup>8</sup>

\*29 In later years Bingham was to wield considerable force as an industrial psychologist;<sup>9</sup> his many later achievements<sup>10</sup> suggest that he was a most persuasive figure. His aptitude tests were to determine the career choices of millions of Americans schooled in the Thirties, Forties, and Fifties,<sup>11</sup> when the societies that he founded and the publications he edited flourished. His aptitude test for music directed its takers to pursue careers ranging from conductor, for those with the greatest aptitude, to lawyer, for those with the least.

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<sup>8</sup> Bingham's work refers to earlier writings of Theodor Lipps ("Zur Theorie der Melodie," *Zeitschrift für Psychologie* 27 (1902), 237, and *Grundlegung der Aesthetik* (1903); Max Meyer, "Elements of a Psychological Theory of Melody," *Psychological Review* 7 (1900), 241-73, and "Unscientific Methods in Musical Esthetics," *Journal of Philosophy, Psychology, and S. M.* 1 (1904), 711; and R. H. Stetson, "Rhythm and Rhyme," *Psychological Review Monograph Supplement* 4 (1902), 413, and "A Motor Theory of Rhythm and Discrete Succession," *Psychological Review* 12 (1905), 250. It also makes reference to the Ellis translations (1895) of Helmholtz's *Sensations of Tone*. Meyer and Stetson both appear to have been associated with Harvard at the time these studies were conducted.

<sup>9</sup> Bingham was the author of a number of books including *Aptitudes and Aptitude Testing*, *Psychology Today* ...

<sup>10</sup> Bingham was the author of numerous books that enjoyed many editions. Among them were *Aptitudes and Aptitude Testing* and *Psychology Today*.

<sup>11</sup> Bingham's hierarchy of musical skills is given in Appendix 2.

## BINGHAM'S SONG-SELECTION RESEARCH

At some time during the second decade of the century Bingham had moved to the Carnegie Institute of Technology<sup>12</sup> in Pittsburgh as an assistant professor of applied psychology.

In 1920 a plan to use phonographs to broadcast messages about exhibits in the nearby Carnegie Museum was proposed to the Edison company by the assistant director of the Department of Fine Arts.<sup>13</sup> This "educational plan" was envisioned as a model that could be widely copied, so, inevitably, the Edison company was interested.

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<sup>12</sup> *The forerunner of Carnegie Mellon University.*

<sup>13</sup> *Robert Harshe.*

It is not clear from surviving correspondence that the museum plan was ever carried out, but Bingham apparently heard of it and devised a differently motivated proposal for the use of Edison equipment.<sup>14</sup> Rarely do we reflect on the extent to which the availability of recorded music may have influenced the kinds of questions that researchers could pursue. It is doubtful, however, that Bingham would have used recorded music in his previous research.

The common ground that Bingham believed to exist consisted of a need to study "the effects of music." Bingham's original goal was to find criteria for identifying systematically those recorded musical works which best served a variety of beneficial purposes. From the point of view of the National Phonograph Company this was market research that could be translated into a short list of items in the Edison catalogue that had the most public appeal. Company officials believed that once these were determined, it would be a simple matter to produce more items with the same musical characteristics.

The first result of this collaboration was an announcement, made by Bingham on October 13, 1920, of the establishment of the Thomas A. Edison Prize for the "most meritorious research on THE EFFECTS OF MUSIC [to be] submitted to the American Psychological Association before June 1, 1921." The amount of the award was to be \$500.

The working vocabulary of psychological research in *c.*1920 is very much in evidence in the list of "appropriate subjects" for submission, which included the following items:

- [Handout]
1. Classification of musical selections according to their psychological effects.
  2. Individual differences in musical sensitivity.
  3. Types of listeners.
  4. Validity of introspection in studying affective responses to music.
  5. Modification of moods by music.
  6. Effects of familiarity and repetition: emotional durability of various types of selections.
  7. Effects of contrasting types of music on muscular activity.
  8. An experimental study of music as an aid in synchronizing routine factory operations.

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<sup>14</sup> Bingham's first approach to the company was in a letter of May 5, 1920, to Mr. [William] Maxwell.

When these goals were reviewed by the recording company, however, the projected results seemed too little directed toward practical development to suit Mr. Edison. William Maxwell, a vice president who seems to have been far more enthusiastic than his employer, wrote on behalf of the firm to Bingham on October 29, 1920, that

We should be very much disappointed if the research work, on which you have been engaged and which we hope it may seem advisable to continue throughout next year, should yield, as its principal result, nothing of greater importance than a classification of our Re-Creations,<sup>15</sup> differing so little from the classifications already in use by the talking machine manufacturers, that the average person would not appreciate the difference . . .

We hope, as a result of your work, to get ahold of some big thought, predicated on the realism of the New Edison [a phonograph model], which can be developed along large lines in our advertising and sales promotion work and which, after being thus presented to the public, can be incorporated in our Re-Creation catalogue as the dominating thought.<sup>16</sup>

A hand-written note of the following day to Edison says, "Dr. Bingham is becoming too commonplace and I am trying to get him up in the clouds again..."<sup>17</sup> Edison's response, appended to his copy of the letter, indicates how little confidence he had in the arrangement: he returned the note with the comment, "Maxwell=You will end in throwing all these things in the waste basket after infinite trouble and irritation."<sup>18</sup>

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<sup>15</sup> "Re-Creations" were recordings.

<sup>16</sup> Box 71, letter of 29 October 1920 from "WM" to W. V. Bingham.

<sup>17</sup> Edison Archive, Box 71, note of 30 October from Maxwell to Mr. Edison.

<sup>18</sup> Because numerous biographies suggest that Edison was a slow learner as a child, educators and psychologists in search of role models for today's dyslexic children often suggest that Edison was dyslexic. His extremely voluminous written correspondence lacks any clear indications that this was the case. Edison's formal schooling lasted only three months.

Matters became more complicated with the involvement of the Federal Advertising Agency, Inc., of New York. On October 30 Bingham's commitment was assigned a new meaning in a letter from this agency.<sup>19</sup>

"What Mr. Maxwell would like to get from you . . . is a classification of present Edison Re-Creations on the basis of the moods which they produce." Although the author concluded that Bingham's work claimed "the intense interest of all of us," Mr. Edison wrote on the copy forwarded by Maxwell that "I doubt the real ability of professors to do anything of use in this line."

Bingham forthwith produced a report<sup>20</sup> of progress on what he now termed the "Edison-Carnegie Music Research" project. In it, Bingham said that the purposes of the project were

(1) "to add to the present very limited store of exact, scientific knowledge regarding the effects of different kinds of music" and

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<sup>19</sup> The author, "HE", relates that he had a "pretty hot half-hour" defending Bingham's work, in the absence of a written report, to Mr. Maxwell, Mr. Mahin, and Mr. Nixon of the Edison Company. He wrote, "I was unable to tell him anything about the progress you had made in this direction . . . ."

<sup>20</sup> Edison Archives, Box 71, report of November 1, 1920.

(2) to "help in the wider dissemination throughout America of these musical emotional values, by making available . . . such results . . . as may be useful . . . in bringing the public to . . . want these emotional effects of music which Mr. Edison has made accessible to them."<sup>21</sup>

Bingham was confident that "the different aims of our research<sup>22</sup> [would] interlock". He proposed that the 700 Re-Creations then available be divided into three categories:

- (1) those with a "marked . . . effect of some sort, as quieting, or stimulating, &c.",
- (2) those whose effect were doubtful or variable, and
- (3) those with no effect at all on feelings and emotions.<sup>23</sup>

As for his own research, he listed as works in progress:

- (1) A study of the **measurement** of individual differences and group differences of affective reaction to Re-creations of music, in which uniformity of response would be judged.
- (2) A study of the effects of **repetition** on emotional effects of Re-Creations, in which the intention was to determine how long it took subjects to grow weary, or at least to fail to respond emotionally to a given piece.
- (3) The development of a **new method of teaching** musical appreciation in "universities, conservatories, high schools and music clubs, by getting the learners to make systematic comparisons of selections with attention directed toward the nature of their appeal . . . instead of studying musical form and [the] history of music."

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<sup>21</sup> *Progress Report, p. 1.*

<sup>22</sup> *i.e., Bingham's research and Edison's commerce.*

<sup>23</sup> *Progress Report, pp. 3-4.*

(4) A thoughtful article by Mr. Follett<sup>24</sup> on the general subject of musical effect, for publication in *The Atlantic*.

(5) A list of suggested selections to be recorded on account of the superior strength of their appeal.<sup>25</sup>

Bingham referred to the expiration of "our work with you" by February 1 [1921] and expressed the hope that his research would produce "new information about the power of music over men's minds and moods."<sup>26</sup> In accompanying material, Bingham asserted that "the best sellers are the selections that exert the strongest effects on the emotions, mood and actions of the listener."<sup>27</sup> He discussed music that was quiet, music that was stimulating, and "heart" [*i.e.*, sentimental] songs. Then he revealed that

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To continue the original investigation of the effects of music and to round it out with those essential supplementary researches on prediction of sales, I should like to have available for the year beginning February 1, 1921, an appropriation of \$15,000.<sup>28</sup>

Bingham travelled to Orange, New Jersey, to defend his plan. He met with his critics on November 9, 1920. The following day Maxwell wrote an optimistic report to Edison. He believed that Bingham's position paper, entitled "What Music Will Do for You," could be developed "into a very big selling point."

#### MAXWELL'S MOOD-CHANGE CHART

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<sup>24</sup> It had not been possible to determine Follett's identity.

<sup>25</sup> *Progress Report*, pp. 4-6.

<sup>26</sup> *Progress Report*, p. 7.

<sup>27</sup> *Progress Report*, p. 11.

<sup>28</sup> *Progress Report*, p. 12.

Because of Bingham's tardiness in pinning down details that could be related to specific recordings, Maxwell took it into his own hands to develop a "Mood Change Chart" that could be used to document auto-assessments of response to designated works in the Edison catalogue. [Handout] This chart was to appear in the January-February 1921 issue of the *Edison Magazine*. Maxwell passed on to Edison a copy of the Thomas A. Edison Prize announcement, which, he had learned, was attracting "a great deal of interest." He further reported, on the basis of Bingham's claims, that there were prospects for the research collaboration of Columbia, Dartmouth, and Johns Hopkins Universities. The point Maxwell most wanted to communicate was that "if we can thoroughly sell the idea that the **big** thing about music is how it makes you **feel**, I think that we shall have done a good deal to counteract the influence of artist exploitation."<sup>29</sup>

[The phrase "artist exploitation" referred to the Edison Company's preference was perpetually fresh talent, in contrast to the practice of the rival Victor company to put performers, especially opera singers, on long-term contracts. Edison regarded performers as incidental to musical performance and contracts as an unnecessary nuisance. The true performer was, in his mind, the "reproduction equipment." In the 1920s the Victor company was dominating sales, despite the greater expense of these contracts and the sometimes less sophisticated nature of its equipment. In addition, the advent of radio broadcasting was cutting into the record sales of both companies, for it enabled mass listening, and this required only a single recording owned by a studio.]

Having gained Bingham's approval for the Mood Change Chart, Maxwell then appears to have consulted Edison on appropriate subjects for public experiments. Edison made the general observation that ". . . the most sophisticated man in New York" would be "an ideal subject . . . because he [would] be the least susceptible to emotion." Edison selected the famous detective William J. Burns to be the first subject, and on November 15 Burns duly became Subject #1. The chart he completed is preserved.

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<sup>29</sup> Box 71, letter of 10 November 1920 from W. Maxwell to Mr. Edison.

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[Show Mood Change Chart]

As reported here, Schumann's "Träumerei" caused Burns's mood to change from "serious" to "care-free," while "Alice Blue Gown" further elevated his mood from "care-free" to "gay."

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The company used this chart in a New Edison promotion which invited the general public to record their own mood changes using, if necessary, equipment in their dealers' shops. In provisional copy produced by the Federal Advertising Agency,<sup>30</sup> it was stated that "Mr. Edison needs thousands of these charts because his research work must be conducted on the law of averages."

In academic realms, the challenge was taken up at Yale during the following spring. In fact, tests were administered to 26 students of the Psychology Department in a musical program presented on the afternoon of May 19, 1921. The selections offered and the performing groups represented were these:

[Handout]

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|--------------------------------------|-------------------------|
| 1. Triumphal March ( <i>Aida</i> )   | Sodero's Band           |
| 2. Cavatina [by Raff]                | Albert Spalding, violin |
| 3. Sally [by Kern]                   | Raderman's Orchestra    |
| 4. Perfect Day [by Bond]             | Anna Case, soprano      |
| 5. Medley of American Patriotic Airs | New York Military Band  |

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<sup>30</sup> Box 71, draft of November 17, 1920.

Reports appeared in the *New Haven Journal Courier* and the *New York Sun* the following day.<sup>31</sup> A subhead in the *Journal Courier* read "Patriotic and Merry Tunes . . . Plainly Affect Feelings."

\*40 Matters took a new direction in the account that appeared in the *Sun*. This article reported that "music may become useful in treating human maladies, and i continued,

The day may come, it is predicted at Yale, when pneumonia will be treated not only with open windows and malted milk but by a few disks of dreamy waltz music. If a man breaks his arm and is restless, a battle march or possible a line of comic opera may be fed out to him after each meal.

A further piece on the Yale experiment, which appear in the *Journal Courier* on the 22nd, elaborated on this idea by stating that "the principal effort of the tests was to determine what kinds of music may be applied in treating **neurotic** patients . . . ."

Back at the Edison Company, there was concern that "the men who participated in the [Yale] experiment are so much above average in intelligence, that the results will not be typical."<sup>32</sup> Here, in fact, a populist definition of artistic success is offered. Maxwell writes

I have become pretty well convinced that nothing is a masterpiece in music, literature, or art, unless it is capable of appealing to all types of people. If a thing requires **education**, before it can be appreciated, I doubt if it **is** a masterpiece.

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<sup>31</sup> These were duly sent on to the company by phonograph dealers, particularly the Pardee-Ellenberger Company in New Haven, who had made arrangements in March to make equipment available for the study. Box 71, letter of February 28th, 1920, from W. O. Pardee to Mr. Wm. Maxwell; letter of 2 March 1920 from "WM" to Mr. W. O. Pardee. This dealership was one that had figured prominently in promotional affairs dating back at least to 1903.

<sup>32</sup> Box 71, letter of 26 May 1921 from "WM" [William Maxwell] to H. W. Rogers.

Maxwell wrote on the same day to Bingham,<sup>33</sup> asking him whether it would be feasible for him to "make a special analysis" of the charts from Yale.

Although it would appear from the large number of mood-change charts that were printed that other experiments of this kind were run, no evidence of their widespread distribution has been found.

#### THE INFLUENCES OF MUSIC ON MUSCULAR ACTIVITY

Bingham's early interest in the influence of music on muscular activity seems not to have been pursued directly, but the Yale Mood Change work did lead to speculation on the question. An internal company report of 1920 makes it clear how the two interests were seen to have become intertwined in the reports of the Yale experiment. An Edison agent named De Forest wished to convey the news that

. . . a Mr. Betzler, one of the physical directors<sup>34</sup> at the Y.M.C.A. College at Springfield, Massachusetts, had achieved signal success in relieving and curing cases of infantile paralysis with a treatment he had originated which included music through an Edison Phonograph.<sup>35</sup>

According to Betzler's account, he had been involved in the treatment of paralysis for some 16 years and for the past four has been using recorded music therapeutically. He selected the Edison phonograph over other models for its tone quality and its easy operability. He complained that many records were easily scratched and that hearing scratches had a negative effect on patients. Betzler provided several case histories, but the musical details are for the most part omitted from his account. He mentioned his successful work with "a noted Harvard

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<sup>33</sup> Box 71, letter of 26 May 1921 from "WM" to Dr. W. V. Bingham.

<sup>34</sup> That is, a physical therapist.

<sup>35</sup> Written by C. H. De Forest to W. O. Pardee of the New Haven franchise, Box 71, letter of February 27th, 1920.

athlete," Horace Quimby, who had been in treatment for four months to reverse the effects of infantile paralysis.

DeForest tried with little success to learn which Edison recordings were used in Betzler's treatments. The nearest to hand was something called "Crescendo," played by the Hungarian Orchestra, one of the countless pick-up groups convened in the Edison recording studios. Betzler seemed to be unable to provide specific titles.

In treatment requiring muscular stimulation, Betzler said, "we use soft easy music to begin with and change the music to more stimulating effects as the case progresses . . . . I am convinced that music plays a tremendous part in the treatment I give." Betzler was, however, a man of great modesty and refused to let reports of his work be used in advertising copy.

#### GATEWOOD'S DANCE RESEARCH

In his initial contacts with the company, Bingham had forwarded "a study of dance music" which was made with the help of members of two professional societies.<sup>36</sup> It was pointed out that

These people may be counted on to help push the sale of records . . . . They want dance records that excel both as dances and as music, and in certain re-creations we have found a happy combination of these two elements. A prepared list of these selections, which are superior to dance to and also superior to listen to, should be accessible to the retail salespeople . . . . If we will curtail the widespread use of poorer dance music through emphasis on the production and sale of the best dance records, rapid advances can be made towards establishing a **finer** type of dancing than now prevails.<sup>37</sup>

The "Study of Dance Music" to which Bingham refers was that of Esther L. Gatewood, at Teachers' College, Columbia University.<sup>38</sup> In his letter Bingham recommends that "such an

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<sup>36</sup> *The National Association of Dancing Masters and the International Association of Dancing Masters.*

<sup>37</sup> *Edison Archives, Box 71, letter of May 5, 1920 from W. V. Bingham to Mr. W. H. Maxwell.*

<sup>38</sup> *Its main points are given in Appendix 2.*

analysis as that described in this paper" be used to determine which selections would meet the dual criteria of listening and dancing value.

Gatewood's research was in fact much more specific than Bingham's. According to her report, several dancing masters "of repute" verified that "the use of the phonograph is quite as satisfactory for dancing . . . as music played by the instruments directly" and opposed the view that "the volume is not adequate [nor] the rhythm . . . as marked".<sup>39</sup> Dancing masters were in "favor of the study and proper classification of dancing records," she maintained. Gatewood conducted an experiment in which lists of 14 waltzes, 22 one-steps, and 26 fox-trots were circulated to a group of dancing masters throughout the U.S. From 25 responses, she was able to identify from the Edison catalogue the five "best" waltzes, fox trots, and one-steps.

[Handout]

Best waltzes:

<b>Record</b>	<b>Title</b>	<b>Words and Music</b>	<b>Date of publication</b>
50511	<i>Beautiful Ohio</i>	Ballard Macdonald and Mary Earl	1917, 1918
397	<i>Mighty Lak' a Rose</i>	Frank L. Stanton and Ethelbert Nevin	1901
291	<i>Perfect Day</i>	Carrie Jacobs Bond	1910
544	<i>Djer-Kiss Waltz</i>	Matthew Woodward; Sam and Lee Shubert	1911? <sup>40</sup>
397	<i>Waters of Venice</i>	Neville Fleeson and Albert von Tilzer	1918

Best one-steps:

<b>Record</b>	<b>Title</b>	<b>Words and Music</b>	<b>Date of publication</b>
50535	<i>Me-ow</i>	Harry D. Kerr and Mel Kaufman	1919
527	<i>Arabian Nights</i>	M. David and William Hewitt	1918
521	<i>Sand Dunes</i>	Byron Gay	1919
458	<i>Rambler Rose</i>	Harry B. Smith and Victor Jacobi	1917
567	<i>Razzle-Dazzle</i>	"Thompson"	1888

Best fox-trots:

<b>Record</b>	<b>Title</b>	<b>Words and Music</b>	<b>Date of publication</b>
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<sup>39</sup> *An Analytic Study of Dance Music [by Esther L. Gatewood, 1922].*

<sup>40</sup> Possibly "Kiss Waltz" from a Viennese operetta of 1911.

50496	<i>Smiles</i>	J. Will Callahan and Lee S. Roberts	1917
479	<i>Indianola</i>	S. R. Henry and D. Onivas	1917
544	<i>Egypt Land</i>	Costello and Casey	1919
567	<i>In My Daddy's Arms</i>	[no print identified]	
511	<i>City of Dreams</i>	[no print identified]	

Gatewood also attempted to adduce from a detailed study of these works which musical attributes most contributed to their success. Among her analytical observations were these:

1. The **melody** must be of such a nature that it soon . . . has a **familiar** sound. Part of this is accomplished by means of small and common intervals of progression. Note particularly the melody of "Perfect Day" or "I'm Forever Blowing Bubbles . . . ."
2. It is more important in the waltz than in [the one-step or fox trot] that the **phrasing** and the cadences be well marked, lessening the importance of the measure.
3. The **rhythm** must be part of the melody; the accent must be woven in with the melody.
4. [As for the **harmony**,] there must be at least one decidedly contrasting voice . . . and a light accompaniment by contrasting instrument(s) . . . which mark out the [beat].

Gatewood's work depended on a certain level of knowledge about music that company agents often lacked. The financial problems that had stimulated interest in academic research in 1920 continued, and in the years 1923-25 it was common for the company agents who were scattered throughout the US and Canada to make their own suggestions about what should be recorded—and how. Why could Berkeley, Oakland, and Alameda not be more hospitable to Edison travelling artists, they asked in 1923. Spanish titles would find a market in Arizona, they suggested in 1924. And in 1925 they requested that the company bring out "Moonlight and Roses" as a waltz, because fox trots were going out of fashion.

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#### CONCLUSION

On February 2, 1922, Maxwell wrote to Charles Edison, one of the inventor's five sons,<sup>41</sup>

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<sup>41</sup> *Charles Edison was later the governor of the state of New Jersey.*

suggesting that for the funding cycle beginning on March 1, \$5,000 be appropriated for the Carnegie Research and \$10,000 be channeled via Bingham to "school research."<sup>42</sup> It appears that Charles Edison consented to this arrangement but his father did not.<sup>43</sup> Maxwell wrote to Bingham on the 27th, "I am very sorry to say that Mr. Edison has determined to discontinue the research work and the school research work. I had hoped for a different decision . . . ."<sup>44</sup>

Anticipating this result, Maxwell had recently reminded Bingham that he stood to earn royalties from his books and, as for the company, "the psychological effects of music represent a field in which we are the leaders . . . ."<sup>45</sup>

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<sup>42</sup> This latter reference was to the dance research of Drs. Farnsworth and Gatewood at Columbia. Maxwell had written to Esther L. Gatewood the previous day requesting a meeting on the 15th.

<sup>43</sup> Box 71, letter of 11 February 1922 from "WM" to Dr. W. V. Bingham. Maxwell wrote to Dr. Gatewood on the 11th requesting a report in lieu of the previously arranged meeting. She responded on the 13th [Box 71, letter of Esther L. Gatewood to Mr. William Maxwell] with a list of concerns, including the observation that "handling the work through Pittsburgh has proved quite a handicap."

<sup>44</sup> Box 71, letter of 27 February 1922 from "WM" to Dr. W. V. Bingham.

<sup>45</sup> Box 71, letter of 2 February 1922 from W. Maxwell to Mr. Chas. Edison.