CHAPTER

6

The 1930s Standardizing Acoustical Laboratory Testing

The 1930s proved to be the foundation years for standardization of acoustical laboratory testing. The decade also marked the beginning of the careers of a number of researchers recognized as prime contributors to the science of architectural acoustics. Although many of these acousticians have since retired or passed away, their pioneering efforts live on in the documents—many of which are now part of the library at Riverbank—that they wrote over the last fifty-plus years.

During the 1930s, although he was in his fifties, Paul Sabine, like his colleagues, continued his work in acoustical testing as well as undertook a new subject that was to be of equal, if not greater, importance to him throughout the rest of his life: addressing and reconciling the philosophical rift between science and religion. Although his writing on this topic flourished later, it was during this period that he first raised the questions that perplexed—and still do, to a great degree—both the theological and scientific communities.[21]

Science, in general, was marked during the 1930s by great advances, and acoustics was no exception. A new wave of theories, the development of improved instrumentation, and more sophisticated testing methodologies resulted in an ever-diverging, ever-more disparate kind of research. Realizing the need to standardize and unify the work being done, Paul Sabine wrote a number of articles intended to illustrate the need for sound testing and prudence.

Sabine's first article, "Transmission of Sound by Walls," which appeared in the January 1930 issue of the *Journal of the Acoustical Society of America, (JASA),* dealt with the calculation of the noise-reduction factor by measuring the sound intensity and then mathematically converting the results in-to decibels (dB), the new unit for sound measurement, to help establish a common unit for measuring noise reduction.

In the article, Sabine discussed the merits of various wall constructions, including continuous masonry (concrete blocks, bricks, gypsum board, plaster), double walls (separated), double partitions (partially connected), wood stud partitions, and steel stud partitions—and various fills—such as sawdust, felts, slags, and various airspaces. He also incorporated a discussion of porous materials to express the definition of sound as demonstrated through testing. On page 184 Paul states:

> Transmission of acoustic energy by partitions of wood, glass, steel, or masonry, which are impervious, must take place by means of the minute vibrations of these structures set up by the alternating pressure of the incident sound. Sound, considered as undulatory motion of the air particles cannot pass through such barriers. For this reason, the gross mechanical properties of mass, stiffness, and internal friction or damping of these constructions determine the reduction of sound intensity which they afford. On the other hand, porous materials allow the alternate condensations and rarefaction to pass through, so that such materials may be said truly to transmit sound as sound. In porous materials, the Reduction Factor varies in a continuous manner with the pitch. At a fixed pitch the increase in the logarithm of the Reduction Factor for a porous material is directly proportional to increase in the thickness.

He then went on to describe further the relationship between the dB- reduction number obtained at certain frequencies and the density (mass) of the specimen. As mentioned previously, the mass law relationship to the noise-reduction qualities of a barrier remains a helpful tool in designing sound barriers that address specific needs. All indications are that the mass-law curve that appears today in virtually every book covering barriers and their respective sound transmission loss characteristics was derived by Paul Sabine.

In a July 1932 *JASA* article, "Weight as a Determining Factor in Sound Transmission," Sabine again used the mass-law relationship. In both articles, there are a variety of data on wall configurations, including doors, windows, plaster, gypsum board, gypsum tile, clay tiles, bricks, concrete, wood, steel, glass, lead, and hair felt as well as various fills and insulations—a fairly comprehensive set of data that provided the test results of 69 different specimen types in approximately 80 different configurations. Data from other laboratories were also included in these articles, giving Sabine an opportunity to raise questions about testing because of differences in procedure among laboratories.

What also became a controversial issues was the use of the arithmetic average value that was discussed in an April, 1931 *JASA* article entitled "Sound Transmission Coefficients and Reduction Factors," which included formulae and a summary of what should be considered by anyone making acoustic measurements. Again, Sabine took issue with others who employed different testing methodologies. Although the last two publications will be discussed at more length later, it is important to note them here as an introduction to his July 1931 *JASA* article aimed at standardizing absorption tests. The piece, "A Critical Study of the Precision of Measurement of Absorption Coefficients by Reverberation Methods," included formulations and comparative data to prove his point. Perhaps Sabine's closing statement best states the issues at hand:

> First of all, it should be recognized that even given all the data, the computation of the reverberation time in any given actual case is a matter of approximate estimate rather than precise determination. The more or less arbitrary setting of an optimum reverberation time for rooms of a given volume is an academic straining for a precision which does not exist in fact. The architectural profession should come to recognize this in specifying reverberation requirements. Second, considerable variation in the absorption coefficients of materials used for acoustical correction may exist without producing appreciable differences in the observed acoustical properties of rooms. Third, present methods of measurement do not give mathematically precise values of the absorption coefficients of materials, but under proper conditions and with skill and care, they do give values which are quite precise enough for application to practical problems. Commercial interests should come to recognize this fact and to lay less emphasis upon the practical numerical values obtained at this or that laboratory. In the vast majority of cases, advantages due to other physical characteristics, such as color, permanence, appearance, adaptability to desired modes of interior treatment, may well outweigh the difference between 0.60 and 0.70 in the value of the absorption coefficient. Just how an architect is to write specifications so as to insure his client's getting his money's worth in acoustical satisfaction has still to be agreed upon, but what one may call the present "war of coefficients" is, in the writer's opinion, a quite meaningless wrangle over practical unessentials.

It is interesting to note that even today these issues of precision, reporting of data, and exactness in methods of mounting a specimen in obtaining absorption coefficients remain unresolved, although certainly not ignored; acousticians frequently discuss these issues at conferences but have yet to reach agreement. Another example of a constant dilemma prohibiting an overall solution centers on the fact that most laboratories test in accordance with the prescribed standard; so, in essence, no particular lab performs its test incorrectly. Nonetheless, when you compare one lab with another, they have some differences. Besides the more obvious physical aspects of the test chambers, there are also irregularities in mounting procedures, instrumentation techniques, calculations, precision determinations, and reporting. Total conformity in testing facilities would require tremendous financial commitments and as seen with various laboratories (including Riverbank), changes made in a chamber might not result in appreciable changes in data anyway. Still, any alterations that do move all facilities toward uniformity will result in more precision and standardization, two goals Paul Sabine strove to achieve throughout his career.

As Paul Sabine's previously discussed articles point out, the only way acoustical testing would ever make any sense at all or provide any meaningful results was if a group of manufacturers joined together and developed an organization to develop a standardized acoustical testing method that would be recognized and used by everyone. The creation of such a test method would provide the much-needed common denominator for data comparison of one product with another or of the same product tested at different facilities. If standardization was not achieved soon, then only chaos would occur, and the manufacturers of acoustical products would suffer the most. Among Paul Sabine's files are many letters to manufacturers, suggesting that standardization be a high priority for their companies.

With about seventy absorption tests already documented, the National Bureau of Standards (NBS), Riverbank, and the manufacturers whose products were involved in these tests realized that differences in data were beginning to create problems. Indeed, the work of Paul Sabine to standardize acoustical testing became increasingly important. Realizing that their own financial interests needed to be set aside to resolve this issue, competing manufacturers agreed in 1933 to form the Acoustical Materials Association (AMA).

The manufacturers agreed to participate in a program in which their acoustical product lines would be subjected to a controlled sequence of tests governed by a committee of representatives from each of the member companies. They also agreed that all testing activities, including the publishing of an annual bulletin containing the new data, would be subjected to review and would be policed by an independent technical advisory committee. The committee would have to include individuals involved in the essential factions of architectural acoustics and the association would not be formed until a suitable advisory committee was established. The latter was only one of many hurdles facing the formation of such an association. After many ballots, the proposed membership of nine manufacturers finally agreed on seven advisers that they felt would satisfy the needs of this newly formed association.

The original nine manufacturer representatives and their respective companies were R. E. Bennett, Thermax Corporation; H. R. Berlin, Johns Manville Sales Corporation; C. W. Bowyer, Calicel Corporation; R. F. Burley, National Gypsum Corporation; F. C. Lloyd, Armstrong Cork and Insulation Company; R. T. Miller, Masonite Corporation; W. Waterfall, Celotex Corporation; S. P. Walker, United States Gypsum Company; and J. A. Will, Atlantic Gypsum Company.

Paul Sabine was elected chairman of the advisory committee, a group that also included V. L. Chrisler, Bureau of Standards, Washington D.C.; Carl A. Erickson, American Institute of Architects, Chicago; V. O. Knudsen, University of California at Los Angeles; R. F. Norris, C. F. Burgess Laboratories, Madison, Wisconsin; F. R. Watson, University of Illinois at Urbana; and S. K. Wolf, Electrical Research Products Inc., New York. In 1938, Wolf was replaced by J.

P. Maxfield, also of Electrical Research Products Inc.. By 1940, R. F. Norris and his corporation, C. F. Burgess Laboratories, were no longer members.

Essentially, the AMA's basic program started in 1933 when Riverbank, designated as the official AMA laboratory, started testing the various AMA member products. Soon the first set of data was compiled, and the first official *Bulletin* (Bulletin No. 1) *A.I.A.* No. 39-6, was issued in February 1934. Another publication, entitled "Theory and Use of Architectural Acoustical Materials," was distributed at the same time with the same reference number.

It should be mentioned that although Riverbank was still using the man-in-the-box technique for data measurement in 1930, Paul Sabine and his technician, Carl Anderson, began developing an acoustic clock that measured sound decay. By 1931, they had received a patent on it, introducing the notion of obtaining acoustical data by way of electronics before the AMA series began.

The number of AMA member firms appeared to rise and fall annually. As early as 1938, the list was down to six members, and in the 1960s, the AMA involved fifteen members. By 1960 as many as thirty corporations had been members of the AMA at one time or the other. Many were absorbed by other corporations, others dropped from the acoustical product market, and some simply dropped out of the organization. Listed below in alphabetic order, followed by the year each member first appeared in the bulletin, are all the firms that have been a part of the AMA:

1. American Hair and Felt Company, 1936
2. American Gypsum Company, 1936
3. Armstrong Cork and Insulation Company (Armstrong Cork Company), 1934
4. Atlantic Gypsum Products Company, 1934
5. Baldwin-Hill Company (Baldwin-Erret-Hill Inc.), 1959
6. The Calicel Company, 1934
7. The Celotex Company, 1934
8. Dant and Russel Sales Company, 1950
9. David E. Kennedy, Inc., 1940
10. Detroit Steel Products Company, 1950
11. The E. F. Hauserman Company, 1947
12. Elof Hansson Inc., 1960
13. The F. W. Wakefield Brass Company, 1951
14. Fenestra Inc., 1957
15. Gustin-Bacon Manufacturing Company, 1959
16. Industrial Sound Control Inc., 1953
17. The Insulite Company, 1953
18. Johns-Manville Sales Corporation, 1934

19. Kaiser Gypsum Company, 1959
20. Koppers Company Inc., 1957
21. Luse-Stevenson Company, 1940
22. Masonite Corporation, 1934
23. National Gypsum Company, 1934
24. Owens Corning Fiberglass, 1940
25. Pioneer Division of the Flintkote Company, 1950
26. Reynolds Metals Company, 1958
27. Simpson Industries (Simpson Logging Company), 1948
28. Thermax Corporation, 1934
29. The United States Gypsum Company, 1934
30. Wood Conversion Company, 1936

Just for the record, during the 1920s, the first official Riverbank pre-AMA absorption test for a paying client was on balsam wool for the Wood Conversion Company. It was tested on a layer of gypsum board from the United States Gypsum Company. The first AMA client testing, depending on which of the following viewpoints you take, was Thermax or Celotex. Some of the test data that appeared in the first AMA bulletin were actually gathered by Paul Sabine prior to the actual formation of the AMA. The dilemma is that Thermax was tested on June 6, 1933, and Masonite on July 12, 1933. The AMA wasn't established until August 1933. The Celotex product was tested August 29, 1933. Therefore, the question arises, does a product truly qualify as being tested for an association before that association officially exists? Written on top of the data sheets for Thermax and Masonite was Paul's note "tested earlier" and on the "For" line were the names of Thermax and Masonite, respectively, but test #3 had "For AMA." Paul Sabine redesignated the Thermax and Masonite tests as AMA tests #1 and #2, respectively, and they were designated as such in the first AMA bulletin.

The AMA test book #1, which included tests 1 through 60, helped establish the actual date for the founding of the AMA as August 1933 rather than just 1933, as noted in an AMA twenty–five year anniversary publication distributed in 1958. There was some doubt about the actual month and day that the AMA was founded, not to be confused with the date that the AMA became incorporated (1934). Although the actual day on which the AMA was founded is still uncertain, we now know that it occurred after August 1 and on or before August 29.

Most of the preAugust 1933 correspondence to Paul Sabine regarding the formation of the AMA involved questions or problems about legal matters, personal biases, or the formation of the technical advisory council. Quite often, Sabine would forward problems not related directly to acoustics to Wallace Waterfall of the Celotex Corporation, and it was he who would resolve certain administrative matters. The Riverbank files disclosed that some of the manufacturers were having difficulty with the formation of such an association. Nevertheless, the AMA was finally established in 1933, and the first bulletin was distributed in 1934.

To get an idea of the importance of the AMA bulletin to subscribers and users alike, it is instructive to look at Bulletin No. VII, which was published in April 1940; it dealt with three topics: (1) theory and use of architectural acoustical materials, (2) sound absorption coefficients, and (3) sound insulation.

Pages 2 and 3 contained the names of the members, directors, technical advisory committee members, and a lengthy preface.

On pages 4–9, segment 1, the AMA recommended three acoustics texts that just so happened to be published by three members of the AMA Technical Advisory Committee: (1) *Acoustics of Buildings,* Watson; (2) *Architectural Acoustics,* Knudsen; and (3) *Acoustics and Architecture,* Sabine. Then the bulletin briefly defined the following acoustical terms: (1) pitch, (2) intensity, (3) reflection of sound, (4) echo, (5) multiple echo, and (6) reverberation.

Explanations of the following concepts were also given:

* Effect of reverberation on hearing
* Effect of volume and absorption on reverberation time
* Desirable reverberation times
* Computing reverberation time—numerical example
* Reverberation at different frequencies
* Location of absorbing material
* Decibel scale
* Noise level in rooms
* Judgment of relative loudness
* Coefficients of materials
* Frequencies for different purposes
* Sound insulation
* Rating sound insulating constructions
* Sound-insulating methods
* Effect of sound absorbing materials
* Sound leaks

Page 10 documented an alphabetic list of trade names. Only one product example from each of the listed members is included in this list, although forty product names in all were given:

Absorbatone	Luse Stevenson Company
Absorbex	The Celotex Corporation
Acoustex	National Gypsum Company
Acoustone	United States Gypsum Company
Airacoustic	Johns-Manville Sales Corporation
Corkoustic	Armstrong Cork Company

Fiberglas Acoustical Tile	Owens-Corning Fiberglas Corporation
Kencoustic	David E. Kennedy, Inc.

Page 11 included typical light-reflection values and a classification of specimen types. Pages 12 through 18 tabularized various products for each company. The following example exemplifies one obvious drawback of the AMA bulletin:

Company name	AMORE Company
Material	Limpa Massa
Thickness	25.4 mm
Type	VI
Mounting	No. IV
Test frequencies	128, 256, 512, 1024, 2048, 4000
Coefficients	.05, .10, .12, .18, .22, .30
Noise-reduction	
Coefficient	NRC = .15
Unit size tested	4 ft by 9 ft. (2)
Light Reflectance	Color W (white), value D (71–75 percent)
Weight	20 pounds
Surface	Irregular and slightly fissured
Test No.	0000

Although this information would be invaluable to users, the AMA neglected to provide a space for a detailed physical description of the specimen. Without such a description, users would not know that the specimen was a one-inch–thick, multilayered composite, more commonly referred to as lasagna (without sauce, of course), placed directly on the laboratory floor.

Did Riverbank ever test a composite layer of lasagna? Keep in mind that the Riverbank staff cannot divulge a client's data without written permission (or, as in some instances, permission is granted to illustrate unusual data but the client's actual name is withheld). Thankfully, the Jello, laundry lint, and oatmeal (dry) issues are not pertinent to this discussion.

Regardless of a few inadequacies, the AMA annual publication did provide a user with pertinent data obtained under controlled conditions, in the same manner, and at the same place. It allowed for direct comparisons and eliminated opportunities for conflict among manufacturers. Each AMA member had the right to withdraw any test results before the bulletin was published. Because results were obtained in an independent laboratory, there was no worry about a manufacturer using his own laboratory and creating any data to keep pace with or to stay ahead of, his competitors. Because the AMA was overseeing product information, many poor acoustical products were never put on the market or in a few cases, removed from the market. Equally beneficial was that some very good acoustical products were developed or improved on as a result of the organization and its standardized testing.

The AMA bulletin was not updated during World War II although older versions were still circulated. In 1947, the AMA resumed operations and once again began publishing an annual bulletin. The name of the bulletin changed, however, no longer was it designated as the "Official Bulletin of the Acoustical Materials Association" but rather as "Sound Absorption Coefficients of Architectural Acoustical Materials." The AMA was cited, however, on a separate line, followed by the number of the bulletin. Additionally, the postwar publications no longer included a list of technical committee members or the AMA officers.

The original technical advisers were a notable group of experts responsible for developing an acoustical testing program used today. In point of fact, the AMA testing without a doubt pioneered standardized acoustical laboratory testing, and the organization's overall contributions are still cited by acousticians as significant in the evolution of architectural acoustics as a science.

To highlight the accomplishments of the AMA as well as to point out the loss suffered in 1977 when the organization disbanded, a list of important events, summarized in the AMA's twenty-fifth anniversary publication, follows:

1933 The AMA was founded to establish procedures that could supply architects and others with reliable data on acoustical efficiency and other physical properties of architectural acoustical materials.

1934 AMA is incorporated.

First research program on sound absorption data was instituted.

First annual bulletin distributed listing sound absorption coefficients of thirty-six products.

Riverbank Acoustical Laboratories established as the official testing laboratory to rate acoustical materials for sound-absorbing efficiency.

1939 An independent testing laboratory selected to rate acoustical materials for light reflection; data included in the official bulletin.

1942 Began cooperation with, and support of, the National Noise Abatement Council.

Defined and established the term "Noise reduction coefficient (NRC)".

1944 Initiated a two-year research program on industrial noise at Colgate University.

1948 Published and distributed theory and use brochure.

1949 The AMA joined American Society for Testing Materials (ASTM) and the National Fire Protection Association (NFPA).

Inaugurated public relations program.

Established fellowship in acoustics laboratory at Massachusetts Institute of Technology (MIT).

C-20 Committee formed to establish test method for rating properties of acoustical materials.

1950 Bulletin name changed to "Sound Absorption Coefficients of Architectural Acoustical Materials"

Received award for exceptional merit from Producers Council and American Institute of Architects.

1953 Selected an independent testing laboratory to rate acoustical materials for resistance to flame spread and included data in official bulletin.

1954 AMA contributed to the initial publication of noise control magazine, a previous publication of the ASA.

1956 Completed a visual aid program, A Picture Story of Architectural Acoustics and Acoustical Materials, in cooperation with Syracuse University and Producers Council to be distributed to architectural schools and colleges.

1957 Endowed Wallace C. Sabine Silver Medal to be awarded by the ASA for outstanding contributions to the science of architectural acoustics.

Initiated research program on test procedure for sound attenuation of acoustical ceilings.

1958 Published and distributed brochure, "How to Quiet Noise in Your Home."

By 1958, membership in the AMA had dropped to thirteen. In December, the same month in which the anniversary was celebrated, Paul Earls Sabine died. Although it is not known whether he ever had a chance to read the anniversary issue, it can be assumed that he would have reflected with pride on the quarter-century of history he had helped shape and on the journal to which he had contributed so often and had made so influential.

As recently as 1987, ten years after the AMA faded away, the publication "The Sound Absorption Coefficients of Architectural Acoustical Materials" still appeared in newly published technical papers, journals, or texts on architectural acoustics. Unfortunately, in some cases, the older versions of the publication were used, and the data that appeared in some documents had been obtained during the 1930s. Besides the outdated data, surely the designated products would have changed as well, if they still existed at all. The authors of these documents, however, did not have anything more recent, a problem that is only now apparent to current technical authors of architectural acoustic literature.

What made the AMA bulletin such a unique publication is perhaps more appreciated today than it was back then. Now that it is no longer available, numerous architects and consultants contact Riverbank every year to ask if there is anything currently being published. They lament the desperate need for a continually updated compilation of acoustic materials performance data. Unfortunately, no such document is available.[22] Two "Compendiums on Materials for Noise Control" were issued by the National Institute of Occupational Safety and Health (NIOSH) in 1978 and 1980, but they, too, are out of print.

Through the years a few publications were produced by other firms, but they, like the others, are not easy to come by. Fortunately, individual corporations publish their respective data extensively, and some associations which are again engaged in testing programs, advertise their respective product lines.

Although Riverbank's affiliation with the AMA was, for the most part, beneficial to both parties, problems did exist, particularly with the scheduling of tests and the establishment of testing prices. From 1933–1947, having only one test chamber to use (not six as Riverbank has today), Paul Sabine tried to set up a schedule to accommodate clients, but for a variety of reasons, some manufacturers had problems getting their product developed and to the lab on time. Sabine noted in one correspondence how amazed he was that virtually all the delays in manufacturing seemed remedied just before an AMA publication deadline when the testing was at its peak. Complicating matters even more during the annual rush period was the manufacturer who would demand additional testing when he received a lower rating than a competitor. This issue prevailed until it was decided that each manufacturer would learn only the results of his tests and his tests only until all results were published. Thus, Riverbank would hold all data until they were released on a predetermined day for publication.

Test pricing was another problem. AMA members felt they deserved a price reduction on their testing. Paul Sabine wrote that he felt like a minnow trying to obtain food from a school of hungry sharks every time he suggested an increase. To satisfy the member-clients, Sabine first suggested an annual fixed fee that reflected a considerably reduced rate. This suggestion was refused, however, because, it was argued, some members had only one product, while others had many. Sabine, then, developed a percentage scheme based on product-testing volume, but this, too, was refused because it was deemed too complicated. Eventually, because he was operating at a loss, Paul Sabine submitted a flat increase and stated that not one more test would be conducted for the AMA until the price was agreed on. Naturally, his proposal resulted in a counterproposal from a number of AMA members: They would discontinue testing at Riverbank if the fee went up. Finally, after Sabine agreed to include a free test for a certain number of paid tests (a discount policy still in practice), the manufacturers accepted the price hike. For a while Riverbank was able to meet operational expenses. Once during this period (1939), Riverbank employees received a whopping five cent-per-hour raise!

By 1967, however, the AMA membership had dwindled to twelve: Armstrong Cork Company; Kaiser Gypsum Company, Inc.; Baldwin-Erret-Hill, Inc.; National Gypsum Company; The Celotex Corporation; Owens-Corning Fiberglas Corporation; Gustin Bacon Manufacturing Company; Simpson Timber Company; E. F. Hauserman Company; United States Gypsum Company; Johns-Manville Sales Corporation; and Wood Conversion Company. The organization changed its title to the Acoustical and Insulating Materials Association (AIMA), hoping that a new name might bring more members.

The first AIMA bulletin didn't indicate that Baldwin-Erret-Hill, Inc., and the E. F. Hauserman Company were still members, but it did note that the Gustin Bacon Manufacturing Company had become a division of the Certain-Teed Products Corporation and the Wood Conversion Company became part of the Conwed Corporation. One new member appeared, the Keene Corporation. Total membership in the AIMA in 1970 was eleven members.

The AIMA membership decreased to ten in 1972 when the Certain-Teed Products Corporation dropped out. Two notes pencilled in the 1971–1972 bulletin stated that the Jim Walters Research Laboratories was part of the Celotex Corporation and that the Gold Bond Company was part of the National Gypsum Corporation. Some individuals still get these respective associations confused. Nevertheless, the AIMA ended in 1975 and became the Acoustical and Board Products Association (ABPA). The six ABPA member-manufacturers listed in Bulletin XXXIV for 1975 ("Performance Data Acoustical Materials") were The Celotex Corporation, National Gypsum Company, Conwed Corporation, Owens-Corning Fiberglas Corporation, Johns-Manville Sales Corporation, and United States Gypsum Company. By 1976, two of the members withdrew, essentially ending the acoustic products bulletin.[23]

In a poll of manufacturers that participated in the AMA program, most agreed that the bulletin had been a good idea, especially for the various needs of architects, acoustical consultants, and manufacturers requiring absorptive products. They also felt, however, that it had been limited in providing other information that would better promote their products. In essence, each found that the company would rather publish and advertise their data in house publications using their own time frame. By doing so, many of the problems of meeting a deadline were eliminated. Also, because the bulletin indicated some products had lower acoustic properties and, therefore, would be considered inferior by a reader, the manufacturer, in its own publication, found it easier to explain merits of those products not dealt with in the AMA bulletin, particularly the features of products designed for lower cost, special applications, unusual designs, and so on.

In summary, withdrawal from the AMA was primarily a matter of advertising preference rather than a way to alleviate testing expenses. Ironically, as far as Riverbank's records indicate, after the AMA, AIMA, and ABPA series ended, many of the same manufacturers did, indeed, continue testing at their own pace. When averaged over a three-year period, in fact, their testing volume increased over what had been averaged for three years in the annual bulletin.

Although the need for a bulletin today is obvious, it is also obvious that changes in the old AMA, AIMA, ABPA format are needed. Information involving esthetics, cost effectiveness, applications, as well as acoustical data and other test-related parameters, is essential. Laboratory credibility and independent product policing must also be considered. Current-day testing policies used by some manufacturers explain why such a publication does not exist today. In some cases, many go well beyond the scope of the old bulletin, but a few might even publish data that are somewhat suspect or misleading. In any respect, the thought of having such an up-to-date publication will most likely persist among acousticians, especially those who remember the convenience and credibility of the old AMA bulletin.