

*Journal of the
American Musical
Instrument Society*

VOLUME XX • 1994



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David Woodrow. *The Shape of Stradivari Violins: Proportions in the Forms and Violins of Antonio Stradivari. Technical Studies in the Arts of Musical Instrument Making.* Edited by David Woodrow. Taynton, England: Taynton Press, 1991. 84 pp.; 18 figures, 28 tables, 17 graphs. ISBN: 1-870952-01-4. £22.00.

A glance at David Woodrow's latest publication might be enough to make all but the mathematically-gifted reshelve the slender volume for later reading. One is inclined to wait until there are ample uninterrupted hours in which to struggle through the complex pages of graphs and statistical analyses. This record of Woodrow's struggle to define the generative form from which Stradivari shaped his violins and how this form varied in application to each instrument clearly requires a practical knowledge of geometry and basic statistics. However, to avoid *The Shape of Stradivari Violins* until such fluency is acquired is to deprive oneself of an exciting tour through thought-provoking questions that will undoubtedly spur further Stradivari research. The author refreshingly defers laying claim to the answer in the ever-popular game of the "Secret of Stradivari." In his final paragraphs he writes: "This has been more a business of opening doors than closing them. . . . Ideas have been left as starting points for others to explore" (p. 84).

Among Woodrow's sources for measurements are the wooden forms in the Museo Civico Cremona; plans from Edward Heron-Allen's *Violin-Making, as It Was and Is* (London, 1885) and Karel Jalovec's *Italian Violin Makers* (New York: Crown, 1958); dimensions from such writings as the Hills' *Antonio Stradivari: His Life and Work, 1644-1737* (London: Macmillan, 1909; repr. New York: Dover, 1963) and Ernst Doring's *The Guadagnini Family of Violin Makers* (Chicago: William Lewis and Sons, 1949); and photographs in *The Strad*, Herbert K. Goodkind's *Violin Iconography of Antonio Stradivari* (Larchmont, NY, 1973) and sales catalogues of the major dealers. One might be skeptical about the accuracy of data drawn from such a conglomeration, but Woodrow assumes that "quantity cleans quality, that is, with many samples . . . the mean will carry the meaning better than the single example" (p. 44). It is true that we are often forced to rely on measurements taken by others, and variations in the techniques of measurement are as much a part of the package as is the distortion introduced by the photographic lens. Such procedures are less than ideal, but they are realities of today's musical instrument research.

Woodrow makes no claim about the precision of his data, and, despite his hodgepodge of measurements and the resultant generalizations, he arrives at several vital conclusions. The ratios that he produced to define the shape of each Museo Civico Cremona form were compared to the same feature on each of the other forms. Because the resultant standard deviation was so small, Woodrow decided that there was indeed a “finely controlled system for generating form outlines” (p. 13). A comparison of these ratios with the conglomeration of measurements yielded a picture of a ground plan that moved until 1706 “like the longitudinal cross section of a waisted balloon being blown steadily up” (p. 44). These variations of shape are detailed in a number of graphs and charts and are primarily of interest to luthiers involved in their own experiments and secondarily, perhaps, to dealers, restorers, conservators, and curators.

Woodrow leaves many questions unanswered. Nevertheless, they must be asked. Why did the 1706 plan remain basically unvaried for the last thirty years of Stradivari’s life? Why did the variation cease when Stradivari was only 62? Had he tired of experimentation? Was he fully satisfied with this form, and, if so, are the violins made after 1706 consistent in sound quality? Does enough of Stradivari’s original workmanship remain on those extant instruments to enable one to make such a determination? Is it possible that his shop workers had taken over so much of the work that an unvarying form was necessary as a type of quality control? This, of course, raises the issue of whether Stradivari employed apprentices at all, since it is apparently quite difficult to see traces of hands other than his own in the instruments.

Woodrow’s study reminds us that much work remains and that many tedious details have yet to be examined. His gauntlet should not go unretrieved. Others should walk through those doors which Woodrow has opened and take up scientific Stradivari research. Woodrow’s followers should make full use of these “starting points” that he has offered in such fine detail.

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