

# Preface

## *Scope & Structure of the Volume*

As already noted by von Békésy and Rosenblith (1948: 727), the major development seen in acoustics starting from the 1930s – stimulated in particular by an analogy with electrical networks and the use of the related electronic equipment – has cast a shadow over other discoveries made previously. Although in these latter years there has been a certain reawakening of interest in this direction, especially with regard to the Scientific Revolution, much work remains to be done. This volume aims not only at helping to bridge the gap, but to extend investigations up to our own times. Albeit limited to wind instruments and organ pipes, it will be seen that such investigations directly concern the core problems of classical acoustics, from the propagation of waves in pipes to the effects of dissipation phenomena, including the emblematic question of the theoretical and experimental determination of the speed of sound inside them. The discussion emphasises historical development, ensuring however that the various chapters systematically deal with scientific and purely explicative aspects.

The volume is made up of eleven chapters, some of them based on studies published at various times between 2001 and 2012. These have been revised, restructured, partly rewritten, expanded (in some cases radically), and – as far as those originally published in Italian are concerned – translated. The eleven chapters, or at least their bulk, originally appeared as follows (see the full references in “Works cited”, under “Barbieri”): Chapter A in 2001a, Chapter B in 2003, Chapter C in 2004, Chapter D in 2007, Chapters E-G in 2005b and 2012a, Chapters H-K in 2005a.

As for the overall organization of the book, the first four chapters deal with the subject starting from the Middle Ages up to the end of the Scientific Revolution. Modern scholars of historical organs will be particularly interested in Chapter B, which is full of technological information on the subject, which in this case extends right to the end of the 19th century. The remaining seven chapters deal with the subject from the early 18th century up to our own times: although physical and mathematical references are of particular relevance, I have sought to minimise the use of mathematical formulae, relegating them largely to the footnotes (the reading of which may be omitted without prejudice to the reader’s understanding of the text). Throughout, I have sought to supplement the discussion with references to performance practice.

*Pitch notation*

During the discussion, I shall use, according to circumstances, the two following notation systems:

|          |       |       |       |       |       |        |          |       |
|----------|-------|-------|-------|-------|-------|--------|----------|-------|
| $C_0$    | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$  | $C_7$    | $C_8$ |
| $CCC$    | $CC$  | $C$   | $c$   | $c'$  | $c''$ | $c'''$ | $c^{IV}$ | $c^V$ |
| middle C |       |       |       |       |       |        |          |       |

The lower one is commonly employed by musicologists in English-speaking countries, while the upper is currently utilised internationally by all acousticians. The latter was proposed by Harvey Fletcher in the year 1934 in the *Journal of the Acoustical Society of America* (Fletcher 1934: 64-5) and its employment was recommended five years later by Robert W. Young (Young 1939: 134-7). It is based on the fact that, with reference to  $A_4 = 440$  Hz and to the equal temperament, the  $C_0$  corresponds to 16.35 Hz, i.e. to the lowest pitch audible to the average ear.

It may also be interesting to learn that the modern unit of measurement for frequency, the Hertz (1 Hz = 1 cps = 1 cycle per second), has only been adopted by the English-speaking world in surprisingly recent times: up to the 1970s the old acronym 'cps' being indeed still used by many acousticians in that area.

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