Book Review
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Handbook of materials for percussion musical instruments
by Voichita Bucur
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1044 pages

This book contains twenty chapters grouped into four parts.
Part I (chapters 1 to 4, pages 2 to 275) is entitled "Percussion Instruments, Their Classification and Their Sound". It contains a general introduction, basic organology and elementary considerations on the physics of percussion instruments. Chapter 4 is devoted to testing methods: sound and vibration measurements, optical and numerical methods.
Part II (chapters 5 to 13, pages 276 to 692) is entitled "Structural Parts of the Instruments". This part contains a fine description of the instruments and of their manufacturing, with a large number of illustrations.
Part III (chapters 14 to 17, pages 694-934) is entitled "Properties of Materials", including the use of wood, metallic alloys, leather and new materials in the fabrication and use of percussion instruments.
Part IV (chapters 18 to 20, pages 936-1039) is entitled "Maintenance and Conservation of Percussion Instruments", and is devoted to maintenance, restoration and patents.
In general, this book contains new features, compared to existing book on musical acoustics, and is of great interest for the musical acoustics community. This is, in particular, the case for Chapter 10 (The Carillon), Chapter 11 (The Celesta), Chapter 15 (Metallic Alloys) and Chapter 16 (Leather). Another appreciable specificity of the book is the high number of clear pictures and figures of wonderful quality which are of great help for the understanding of the text. In addition, a summary is given at the end of each chapter.

Due to the impressive size of the book (1044 pages!), it is quite impossible to comment each Section in detail. Thus, here are only some highlights of particular interest. In Chapter 1, on can read an original and interesting introduction to the evolution and composition of orchestra, with examples of musical works which make use of percussion instruments. Chapter 4 is a useful complement to more physical books. It contains a thorough description of the instruments and of sound and vibrations measurements with emphasis on recent results. Chapter 8 is clear, nicely illustrated and easy to read. Il contains important information on the consequences of hammering in the manufacturing of gongs, which are difficult to find elsewhere. Chapter 10 is very informative with detailed description of the structure and of the mechanical systems of the carillons. It is complemented by considerations on the chemical composition and tuning of the bells. The Celesta (Chapter 11) is not very well-known, and there are only a few publications on this instrument, and therefore this chapter is most welcome. Chapter 14 (Wood) clearly corresponds to one major specialty of the author, and it contains a significant summary on the use of such materials in percussive instruments. In Chapter 15, the author describes important basic results on residual stress and strain, on fatigue of materials, microstructure, damage and phase diagrams. This is not common in musical acoustics, and these connexions to solid mechanics deserve to be recognized. Reliable data on leather are difficult to find in the literature, and thus Chapter 16 is very useful. Again, this is a significant new contribution in the musical acoustic field. In general, chapters 14 to 19 contains important results for researchers and engineers in musical acoustics in the context of common work and discussion with instrument makers.

To conclude, this book is a compulsory starting point for any future research on percussion instruments, and should be usefully associated with other books and publications more specialized in physical modeling. The references are extensive and beyond the usual references lists in musical acoustics. It opens a large amount of future creative research topics as, for example; on the links between materials parameters and sound quality, which are recurrent requests of makers and musicians.