More Thoughts on the Discipline of Organology

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This contribution is the fourth on the topic "Organology" published in consecutive issues of the this journal.[1] There is little that can be added to the philosophy articulated in the previous articles, that organology should be pursued in the broadest possible meaning of the term: as the study not only of an instrument as an object per se, but also in its musical, historical, sociological, technological, symbolic, and scientific context.

As someone who has been cataloguing musical instruments in different European and North American museum collections for quite some time and in different fields—principally stringed keyboards and brass instruments—I would like to take the opportunity to address the challenges of the practical side of organology, point out some of its current problems, and contemplate its values beyond its own boundaries.

The musical instrument as object per se?

Organology is often categorized as an auxiliary branch of musicology. Probably to an even greater extent in German-speaking countries than in the Anglo-Saxon community, this means that the study of musical instruments is thought to be inferior to the study and interpretation of the music itself. Knowledge about musical instruments is too often considered a troublesome but necessary tool to facilitate the understanding of music, but unworthy of serious study in itself. Consequently, organologists feel the need to downplay the purely technical description of a musical instrument as too narrow-minded, with the result that the "fieldwork" of descriptive cataloguing of musical instrument collections is regarded as a short-sighted approach. Similar accusations of positivism, restricted to fact-gathering instead of interpretation, have been put forward with regard to the editing of music, for example by Joseph Kerman in 1985 in his call to "Criticism."[2]

However, as in editing musical texts (which involves the critical judgment of the editor in every single note, thus being inseparable from interpretation, as Margaret Bent has pointed out[3]), there is no limitation to the purely technical aspect of a musical instrument, even in the simplest, most rudimentary checklist. Listing the pitch of a brass instrument or the compass of a keyboard instrument can have great musical or sociological implications. Little technical significance is attached to the knowledge that a certain trumpet is pitched in B♭, but this fact implies that the instrument can be used for a particular repertoire, and that it was built not in the seventeenth or eighteenth, but in the nineteenth, twentieth, or twenty-first century. Similarly, listing the compass of a keyboard instrument is not merely descriptive. It is not even limited to musical implications, such as the repertoire for which the instrument can be used, but in some instances can also tell something about the wealth of its original owner, who might or might not have been able to afford additional keys in the treble or in the bass, thereby leaving us with an instrument with an unusually large or small compass for its period.

Among other organological sources—iconography, written texts, and music—there can be little doubt that the surviving instruments themselves are the central "documents" leading to the understanding of their history. While earlier centuries are not well represented by surviving instruments, the seventeenth, eighteenth, and particularly nineteenth and twentieth centuries provide us with increasingly rich material sources in museums and private collections. Only a fraction of these holdings is presently well described in publications. How can we understand the history of our musical heritage when we have not looked in our basements and attics and the art objects they contain? Furthermore, since every generation asks new questions and has new methods of analysis, it will be necessary to look at these holdings with fresh insights and ideas again and again over the course of time, just as new editions of familiar music will continue to be produced in order to shed new light on the past and deepen our understanding.

The challenges of cataloguing

Terminology

The challenges of cataloguing begin with correct terminology. While there is no ambiguity about the words "harpsichord" and "clavichord," it is almost impossible to define the word "spinet," which may mean a smaller plucked keyboard instrument, a tiny upright piano in a twenty-first-century American home, or any kind of keyboard instrument the furniture curator of a museum could not identify. For brass scholars, the distinction between a cornet and a trumpet is occasionally a matter of debate. Furthermore, brass instrument terminology presents us with particular difficulties when it comes to the determination of sizes, which are often part of an instrument's name. This can vary from one language to another (as with the tenor horn, called *Althorn* in German) or even in the same city within a few years: the "tenor" saxhorn in E♭ illustrated in Jean-Georges Kastner's *Manuel Général de Musique Militaire* (Paris, 1848) is the same instrument Adolphe Sax himself classified as *Saxhorn Alto en mi Bémol* in his *Nouveau Prospectus* (1845).[4] This ambiguous use of "alto" and "tenor" might be a relic of the joint alto/tenor size of earlier centuries.

These illustrations demonstrate that an analysis of the object "musical instrument" per se is not possible, even when it comes to the rudimentary act of listing an instrument's name. The conceivable approaches to this problem of correct terminology are as manifold as the problem itself. The obvious solution seems to be to call the instrument what the maker himself called it. For instruments built in the nineteenth and twentieth centuries, such an approach often yields a name that can be verified in advertisements and sale catalogues, though it is less appropriate for instruments built in earlier times. But as the cases above have revealed, this method might just add to the confusion. The same name might be used for different instruments by two different makers, or conversely, instruments of the same construction might be given two different names.

The various systems of instrument classification, beginning with Victor-Charles Mahillon and Hornbostel/Sachs, to Arnold Myers' recent approach to brass-instrument-related taxonomy, based on analysis and comparison of bore diameters,[5] have done much to impose order on this terminological chaos. But despite these efforts, organology still faces

the lack of a valid terminology when it comes to specific instrument names in many areas, and particularly as regards brass instruments. If one carries this exercise a step further, from the name of an instrument to the terms for its parts, the situation becomes even more confusing. To describe the object of one's research unambiguously, though, is the inevitable basis of respectable scholarship.

The lack of a valid terminology on the level of the individual instrument seems to be rooted in the general approach taken by many organologists in the past when classifying their research objects. Margaret J. Kartomi distinguishes between "downward" and "upward" classification systems of musical instruments.[6] The Mahillon and Hornbostel/Sachs classification is a "downward" system in which instruments are grouped together according to general similarities, as in the four main categories—*idiophones*, *membranophones*, *chordophones,* and *aerophones*—each of which spreads outward through a system of differentiation. This system aims to classify instruments irrespective of time and place. It is thus not historically oriented and consequently unable to take into account aspects of change in musical instruments—their regional, sociological, morphological, and performance-practice contexts, to name just a few. This type of classification is bound to have limitations when it comes to naming an individual instrument in a certain historical period and place, and it is evident, for example, from Curt Sachs' rather confusing definition of the *Kornett* (cornet), full of prejudice against the instrument, in his *Reallexikon der Musikinstrumente.*[7]

There is no doubt that the Hornbostel/Sachs classification is very useful for sorting instruments in museum computers and locating them. It has its limitations, however, at the lower levels. This is why it was criticized increasingly by organologists in the course of the second half of the twentieth century. Hans Heinz Dräger was the first to develop an "upward" method of classification, based on the detailed inspection and delineation of an instrument's characteristics.[8] Starting with the individual instrument, Dräger described it in all its facets—not only in its construction, but also in its musical, social, historical, technological, and religious context. These aspects can be of critical importance in identifying the correct term for an instrument. For example, whether an instrument is called a "fiddle" or a "violin" depends entirely on the social and musical context, both being of essentially the same construction. The upward system of classification, based on the holistic view that considers the individual instrument in all its complexity—regarded by Kartomi as the possible future system for organology—seems to be of great value for organological research as well as everyday museum work. While the downward classification system is too abstract for the use of museums' labeling systems, the upward classification could be very useful, provided it becomes more standardized.

When I suggested the foundation of a "terminology" committee as part of the organology section of the Gesellschaft für Musikforschung a couple of years ago, my German colleagues immediately dismissed my proposal as too difficult, if not impossible.[9] I faced the same problem of diffuse terminology again in the English language when I started my work with the Joe and Joella Utley Collection of Brass Instruments. Some of my English-speaking colleagues, notably Arnold Myers, are at least willing to pursue the challenge of developing a valid terminology for organology, particularly for brass instruments. The first

step of our English-language "organological terminology working group" was to set up a website with the title "Draft Text for the Brasswind Terminology Working Group."[10] It includes definitions not only of instruments, but also of their components.

Pipe organ research has always been the most advanced discipline within organology. The fact that there is a multilingual dictionary that lists the names of numerous parts of the organ, with the help of drawings, in nineteen different languages (including obsolete ones such as Latin) proves that such an objective can be pursued successfully.[11] The German *Bildwörterbuch Musikinstrumente* is a step in the same direction, but it deals primarily with contemporary instruments and does not consider historical changes.[12] Also, Günter Dullat gives a German glossary of terms for brass instrument parts in his book *Metallblasinstrumentenbau.*[13] No comparable work in English exists to my knowledge, except for the terms for a natural trumpet, given in Robert Barclay, *The Art of the Trumpet-Maker.*[14] A problem of all existing glossaries is the lack of standardization.

These are just starting points. A real solution to the bewildering problem of terminology in organology can be achieved only by calling together a committee of specialists for each instrument type. This committee could then decide on a generally valid—probably in some cases, artificial—terminology, comparable to the technical language in other scientific fields, such as botany or medicine. The traditional instrument names could co-exist with the rigorous "scientific" names as subordinate systems, just as local names for plants, varying in different regions within the same language area, also exist side-by-side with the unambiguous Latin botanical terms.

Determination of pitch and musical qualities

Herbert Heyde points out in his contribution to this series that a merely technical-descriptive approach—although a necessary basis for the understanding of instruments and therefore very helpful—may not lead to a comprehensive historical understanding of a musical instrument.[15] He proposes therefore to add an interpretative step that takes other historical sources into account in order to view the musical instrument in the context of historical thinking.

As an example of how the latest, purely technical-descriptive aids can indeed help to reveal historical methods and possibly historical thinking, Heyde mentions BIAS[16] as a useful tool. This system, developed for brass instrument makers to help them improve their instruments by predicting the acoustical effect of bore changes, can also be used to determine the pitch of an existing historic instrument and its musical-technical qualities. It has its limitations in requiring that the tested instrument be leak-free, and the selection of a mouthpiece can introduce an element of guesswork—but these limitations also apply to a player's judgment of the instrument's pitch and musical qualities. In using BIAS as an aid in cataloguing we not only have an object-friendly tool that avoids the danger of corrosion from moisture when an instrument is played, but we also can achieve a result that is more objective than that obtained by means of the player's lips. Therefore the latest scientific tool can serve as an aid to historical understanding. For example, from the results of BIAS measurements gathered by the author to date, variations in pitch in nineteenth-century

instruments seems almost unending, and they cannot be described adequately by the categories we usually use to identify standard pitches (i.e., high pitch, low pitch, diapason normal).

The analysis of a trumpet by Johann Wilhelm Haas in seven-foot D (at a^1 = 434 Hz) from the Utley collection (National Music Museum, The University of South Dakota, cat. no. 7212) with BIAS revealed that there is a small impedance peak at 181 Hz (= between *f* and *f*♯). This peak is also supported by two more peaks at 362 Hz and at 721 Hz. This suggests that there is a playable note that corresponds to a slightly flat major third between the second and the third harmonics, though it is slightly too sharp for the minor third. Therefore it could have been intended as both a minor and a major third above the *second*(!) harmonic. This might be an accidental byproduct of the present condition of the instrument, which was deliberately restored very carefully in order to minimize changes in historical substance. But it also could perhaps hint at a deliberate plan of master Haas. Of course such purely observational data, achieved with the aid of a modern tool, would have important implications for understanding the musical use of this instrument in its own time. It might mean that the old Nuremberg masters deliberately changed the bore of some instruments in order to make playable certain notes in the lower register that are outside the natural harmonic series. Such instruments might have been designed, for example, to play chorale tunes in Johann Sebastian Bach's cantatas. Thus merely by analyzing the object per se in an attempt to determine objectively its pitch and musical qualities, we may gain important insights into its musical use and capabilities.

Determining the maker's name, provenance, and date of an instrument

Listing the name of the maker of an instrument, an expected element of a basic checklist, often involves a great deal of first-hand research that may reveal fascinating details about the maker's life and the society and time in which he lived. Determining who actually made a Haas trumpet—Johann Wilhelm, Wolf Wilhelm, Ernst Johann Conrad, or a person outside of the family who worked for them (a so-called *Stückwerker*)—requires knowledge about the complicated trade organization of the former Imperial City of Nuremberg; despite the fact that it is a seemingly simple, purely descriptive act to specify which of the various hare motifs is used.[17] A signature on a later (i.e., nineteenth-century) brass instrument is often an unreliable indicator of its maker, or the factory in which it was made, but may instead refer to the dealer who sold it.[18] Only rarely does one find both the maker's stamp and the dealer's name on an instrument. This is the case with a contralto saxhorn in B♭ in the Utley collection, stamped with the name of the French dealer B. Verdeau, St. Antoine (Gironde), as well as the mark of the maker, Arsène Zoë Lecomte (1818-92)—a tuning fork and the initials A.L & C^{IE} (NMM/USD, cat. no. 7303). More often the knowledge of trade routes and relationships is essential to identify the maker of an instrument, beyond the information found in its signature.

Determining the date of an instrument's manufacture may involve not only comparison with other similar instruments, but may also require knowledge of the history of design as well as the musical repertoire that could be played on it. In determining the provenance of

an unsigned instrument, even a discipline as seemingly far removed from organology as heraldry can be very important.

Technical description, construction details, and decoration

The information we have discussed so far is required, not only for detailed catalogue documentation, but also merely for adding any instrument to a simple checklist. As soon as one gets into a slightly more detailed description of the object "musical instrument," one encounters all kinds of new challenges. In keyboard instruments, for example, there is the important issue of determining woods, a skill not customarily taught at a musicological institute. Here methods such as microscopy can help us follow the historical track. Precise determination of wood-types used in a musical instrument or in a case for a brass instrument can yield vital information concerning the object's provenance. All kinds of interesting questions of context arise with the use of certain woods in instruments. For example, the fact that mahogany and other exotic woods were relatively cheap in England in the eighteenth century can be explained as a byproduct of the history of shipping: these woods were used as ballast in ships returning from South America. The entire issue of the supply of materials for musical instruments (wood, metal, paper, leather, fabric, and so on) can reveal multifaceted information about connections among various cities and economic relationships among different regions that go far beyond the musical instrument per se.

Robert Barclay, in his book *The Art of The Trumpet-Maker*,[19] has admirably demonstrated the close interconnections between the technical aspects of musical instrument making and social and economic factors. Brass instrument production in Nuremberg would have been simply impossible without the network of metal crafts on which these trumpet makers relied completely.

Recording the simple observation of the presence or absence of a tab seam in a trumpet bell hints immediately to a broader context. It determines whether the instrument was hand-made in a small shop, or pressed hydraulically or spun in a large-scale industrial operation.

When it comes to the description of decorative features, awareness of context is often essential. For example, through detailed observation of the figures on the ball of the Haas trumpet mentioned above, one of them could be identified as a black person because of its physiognomy[20]; the other two figures are white. Why would a Nuremberg trumpet maker around 1700 cast these figures on an instrument? The search for an answer to this question soon led to a simple explanation: the figures represent the Three Wise Men. The fact that the other ornamental motif on the instrument depicts angels reinforces the religious symbolism. Christian symbols on a trumpet—the messenger's instrument for proclaiming the power of God—are not surprising.

The cultural perspective of organology

The cultural significance of musical instruments has been more clearly seen and described by ethnomusicologists than by organologists, who deal more with Western art music than with folk musical instruments. While in Western art music certain musical instruments were status symbols of the powerful and the rich, guiding them in ceremony and war, in the folk

and vernacular sphere similar types of instruments serve simple communication functions, such as signaling over long distances, the announcement of danger, or a call to religious worship. Musical instruments accompany the celebration and mourning of important life events, such as birth, marriage, and death of ordinary people as well as of high society. All these functions are particularly relevant to brass instruments, since they provide the necessary volume when played outdoors.

The visual appearance of court trumpets up to the eighteenth century has very little to do with their musical function, but is determined primarily by their cultural and political status. Silver-plated and possibly even gilded, highly decorated, draped with coats of arms, and played by trumpeters in costly uniforms, their principal function was to show their owners' power and wealth in spectacular ceremonies. The instruments were owned by the emperor, the king, or other ruler, not by the trumpeters themselves. The value of the instruments and their importance for the prestige of their owners was reflected in the social status of the trumpeters. They were not only highly respected and well paid, but also carefully protected in their exclusive status through royal privileges. They were expected to play only before "princes, counts, lords, nobles, knights, or otherwise qualified people."[21] Altenburg describes the function of the trumpeters and kettledrummers at European courts as follows:

> [They are] essential to princely pomp, for besides [the fact] that the sound of the trumpet stands out more solemnly and magnificently [than any other instrument] (especially in the open air), [it is also true that] a grand sovereign creates a great sensation if he can display one or two choirs of trumpeters and kettledrummers, [all] clothed in sumptuous livery, and [blowing] silver trumpets.[22]

The visual aspect is at least as important as the audible aspect here, thereby reflecting the cultural context of these instruments.

In his book *Eine Erfindung und ihre Folgen*,[23] Christian Ahrens describes how the invention of valves—a technical part of the instrument—overcame the privileges enjoyed by a small group of trumpeters, rigidly restricted in number, and made brass instruments accessible to a broader social stratum, comprising players as well as listeners. Ahrens describes the close interconnection of social, economic, and political factors in the course of this development. For example, the huge production of brass instruments in nineteenth-century France was made possible in part by the fact that guilds were forbidden after the French Revolution, because they were thought to be contrary to democratic principles.[24] The large-scale expansion of brass-instrument production in the nineteenth century would not have been possible without changes in the political situation. The tremendous growth in the popularity of brass instruments in later-nineteenth- and twentieth-century community, high-school, and works bands was clearly not due to musical factors alone. Equally important, if not even more so, was the social aspect of participating in an organization with people of similar interests, musical as well as ideological. Trevor Herbert describes the

demographic background of the rapid development of brass bands in nineteenth-century Britain,[25] made possible in part because people moved closer together and lived in urban instead of their former rural environments. An important stimulus for the formation of brass bands, and therefore for the production of brass instruments, was the altered work schedule of working-class people, allowing more leisure time. Filling this leisure time bë participating in a brass band was considered to be morally uplifting. Mass production made brass instruments affordable for people of moderate means, thus the quality of a brass instrument one might study in a museum or private collection immediately suggests the social status of its original owner.

In Switzerland the herdsman's and peasant's signaling horn, the alphorn, has become a national symbol,[26] imbued with many different cultural, political, and economic implications. The ancient Swiss democracy was founded and supported by an independent rural population. They promoted their working-instrument, the alphorn, which they used in herding the cows. While it was primarily a herdsman's instrument, it was used for economic reasons, to calm the cows and thereby enhance dairy production. After nearly dying out, the alphorn was deliberately revived in the nineteenth century and later cultivated as a means of advertising the natural beauty and culture of Switzerland to promote tourism; thence it became the national symbol.

Finally, the Moravian trombone choir, in announcing the death of church members with distinguishable melodies according to their individual status—infant, married sister, widower, etc.—reaches out to the whole life of the community. Therefore dealing with a single musical instrument can open up spheres of almost any other human activity. It can give us important insights into the structure of societies, people's culture and beliefs, and the regulations of their daily life.

Conclusion

For organologists who have done a lot of down-to-earth cataloguing, none of the thoughts related above are new, of course. It seems worthwhile to recount them here, however, as a means of refuting the often-repeated statement that a merely descriptive approach to musical instruments is pointless. The analysis of a single musical instrument is not possible without awareness of context, even at the most rudimentary level.

No single person can achieve alone all of the above-mentioned tasks required for the informed documentation of musical instruments. No single person combines the knowledge and experience of an organologist, musicologist, historian, ethnologist, technological historian, sociologist, theologian, heraldic specialist, art historian, acoustician, instrument maker, photographer, and so on. Working together with specialists from other fields is therefore crucial if one seriously wants to achieve the goal of understanding a musical instrument in its entirety. A musical instrument collection housed within a larger museum devoted to technology, art, or cultural history—or one that is affiliated with a university—can achieve this goal more easily. However, even where this is the case the possibilities of collaboration often are not utilized effectively. This is a pity, since the holistic approach to

musical instruments can help us to understand societies and cultures past and present. Organology's relevance therefore extends far beyond the tiny community of organologists, and it should not be understood simply as an auxiliary discipline of musicology.

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NOTES

[1] The three prior contributions to this series are Renato Meucci, "On 'Organology': A Position Paper," *HBSJ* 11 (1999): viii-x; Arnold Myers, "Organology: A Position Paper," *HBSJ* 12 (2000): viii-xi; and Herbert Heyde, "Methods of Organology and Proportions in Brass Wind Instrument Making," *HBSJ* 13 (2001): 1-51.

[2] Joeph Kerman, *Contemplating Music. Challenges to Musicology* (Cambridge, Mass.: Harvard University Press, 1985).

[3] Margaret Bent, "Fact and Value in Contemporary Scholarship," *The Musical Times* 127, no. 1716 (February 1986): 85-89.

[4] See the comparative list in Malou Haine and Ignace de Keyser, *Catalogue des Instruments Sax au Musée Instrumental de Bruxelles* (Brussels: Musée instrumental, 1980), pp. 136-38. A discussion of the diffusing brass instrument terminology in German-speaking countries and regions in the nineteenth century is given in Erich Tremmel, *Blasinstrumentenbau im 19. Jahrhundert in Südbayern* (Augsburg: Dr. Bernd Wißner, 1993), pp. 54-61.

[5] Arnold Myers, *Characterization and Taxonomy of Historic Brass Musical Instruments from an Acoustical Standpoint* (Ph.D. diss., The University of Edinburgh, 1998).

[6] Margaret J. Kartomi, *On Concepts and Classifications of Musical Instruments* (Chicago: University of Chicago Press, 1990), Chapters 11 and 12. The following very brief synopsis of the history of Western classification systems in the twentieth century is taken from this work.

[7] Reprint (Hildesheim/New York: Georg Olms Verlag, 1979), pp. 229-30.

[8] Hans Heinz Dräger, *Prinzip einer Systematik der Musikinstrumente* (Kassel/Basel: Bärenreiter, 1947).

[9] I made this suggestion during an organology session at the annual meeting of the Gesellschaft für Musikforschung in Halle, September, 1998.

[10] http://homepages.ed.ac.uk/ezhm01/btt.html

[11] Winfried Praet (general ed.), *Orgelwoordenboek,* 2nd edn. (Nieuwkerken, Belgium: Centrum voor organologische studies, 2000).

[12] Klaus Maersch, Ulrich Rohde, Otto Seiffert, and Ute Singer, *Bildwörterbuch Musikinstrumente* (Schott: Mainz, 1987). Günter Dullat's *Fachwörterbuch Holzblasinstrumentes & Metallblasinstrumente.*

Bauteile-Instrumente-Technologien-Skizzen (Nauheim: the author, 1997) also deals principally with terms relating to modern instruments.

[13] Günter Dullat, *Metallblasinstrumentenbau: Entwicklungsstufen und Technologie* (Frankfurt am Main: Erwin Bochinsky, 1989).

[14] 2nd edn. Oxford (Clarendon Press of Oxford University Press, 1996).

[15] Heyde, "Methods of Organology."

[16] This commercially available system is described in Werner Winkler and Gregor Widholm, "BIAS Blas Instrumenten Analyse System," in *15 Jahre Institut für Wiener Klangstil. Hochschule für Musik und Darstellende Kunst in Wien,* ed. Eduard Melkus (Vienna: Institut für Wiener Klangstil, 1996), pp. 95-106.

[17] The sign of a leaping hare facing left indicates that the instrument was built by Johann Wilhelm Haas; a hare leaping to the left, looking backwards, with rear feet on the ground indicates Wolf Wilhelm; and a hare running to the left looking backwards with all feet off the ground indicates Ernst Johann Conrad. If the word *macht* or *fecit* does not appear in the signature it is possible that the instrument was made by someone outside the Haas family, working as a supplier.

[18] Herbert Heyde, "Maker's Marks on Wind Instruments," in William Waterhouse, *The New Langwill Index* (London: Tony Bingham, 1993), pp. xiii-xxviii.

[19] See n. 14.

[20] I am grateful to Laurence Libin for sharing this observation with me.

[21] Johann Ernst Altenburg, *Versuch einer Anleitung zur heroisch-musikalischen Trompeter und Paucker-Kunst* (Halle: Joh. Christ. Hendel, 1795), p. vii.

[22] Ibid. English translation by Edward H. Tarr (Nashville, Tennessee: Brass Press, 1974), p. 28.

[23] Full title: *Eine Erfindung und ihre Folgen: Blechblasinstrumente mit Ventilen* (Kassel: Bärenreiter, 1986).

[24] Ibid., p. 87.

[25] Trevor Herbert, "Brass Bands and Other Vernacular Brass Traditions," in *The Cambridge Companion to Brass Instruments*, ed. Trevor Herbert and John Wallace (Cambridge: Cambridge University Press, 1997), pp. 177-92.

[26] Brigitte Bachmann-Geiser, *Das Alphorn: Vom Lock- zum Rockinstrument* (Bern: Haupt, 1999).