

Frank Bär

Change as a rule? About alterations in musical instruments

Musical instruments in unaltered, original and good conservational condition are cherished by curators, collectors, auctioneers and marketing specialists of museums. However, a close look at historical instruments in collections reveals that many of them have undergone substantial changes during their lifetime. Modern technical methods of investigation have increased the possibilities of detecting alterations which so far had not been found by methods of e.g. style analysis or tracking the provenance. Often, when an 'oldest' or 'unique' instrument turns out to be a pasticcio, the deception is deep.

But things change, if one starts to ask why musical instruments have been changed, be it by a musician, an instrument maker, or even a museum. Alterations most often serve a practical purpose, and asking for this purpose makes the difference between a static 'photograph' of an 'untouched original' and a 'lively movie' of an object having undergone changes during its history.

The paper shows examples and presents the start of a categorization of the reasons for changes. The question will be asked for whom the conservational state of a musical instrument is of the greatest worth, and, to what extent an unaltered historical musical instrument is a rule or an exception.

Jenny Nex

'The Trade Art and Mystery of making Forte Piano Guittars': what can English guittar makers Christian Clauss and Charles Pinto tell us about the business of musical instrument making in late eighteenth-century London?

An increasing amount of archival research is being undertaken in order to construct a model of musical instrument making in eighteenth-century London. However it remains difficult to find information which illuminates the inner workings of companies: how their work and domestic spaces were organised; how their finances operated; who was contributing to the various operations. Two documents, each relating to a different English guittar maker, can help us to address some of these issues. The inventory made in 1792 following the death of Charles Pinto gives us a glimpse into his premises in Johnsons Court and shows how his working and personal lives were inextricably entwined. Christian Clauss and his business partner Joseph Levy disagreed dramatically over their business affairs, culminating in a court case in 1786. Documents relating to this case give us an insight into their financial affairs and general business practices, showing how even small firms relied on external funding and skilled journeymen. Together these two little-known makers have enabled us to move one step forwards in establishing the working practices of musical instrument makers in early industrial London.

Jocelyn Howell

At the Sign of the ‘Huge Monster Bass’: the history and development of Besson & Co. Ltd and its acquisition by Boosey and Hawkes

The acquisition of Besson & Co. by Boosey & Hawkes was a gradual and lengthy process, which evolved from mutual association during the early twentieth century to complete integration in 1968. The directors of the new company of Boosey & Hawkes, formed in 1930, realised that the market was only able to sustain one big manufacturing firm, and they set about acquiring rival businesses in order to maintain their dominant position in the market. Besson, the only British firm that provided serious competition to the new company, was thus perceived to be an attractive and necessary acquisition.

This paper follows the development of the British company of Besson from its re-establishment as a limited company in 1895, through its increasing collaboration with Boosey & Hawkes during the 1930s, the war years, the merger and subsequent integration of product lines, to the final transfer of shares to Boosey & Hawkes in 1968. By acquiring Besson, Boosey & Hawkes achieved monopoly of the market and became one of the largest and most successful instrument manufacturing companies in the world.

Tula Giannini

The Raoux Family of Master Horn Makers in France, New Documents and Perspectives

The Raoux family of master horn makers in France dominated horn manufacture during the time when its design was being transformed from the 18th century *cors solo* to the 19th century *cors à pistons*. This paper, based upon my research at the Archives Nationales brings to light heretofore unknown documents forming a new historical narrative from the death of Joseph Raoux, 1787 to the death of his grandson, Marcel August Raoux, 1871. My presentation focuses on Marcel Auguste, his workshop, family and fellow horn makers/players, Courtois and Dauprat. His unhappy 10-year marriage, which ended in formal separation in 1836 and his tumultuous career, were offset by the one constant in his life, the building in Paris on the rue Serpente he inherited from his father; it served as his home and workshop, the place where his mother resided until her death in 1847. Raoux died 3 Juin 1871 at his apartment on the Boulevard Saint Michel no.38. Unusually, his testament contains a eulogy to his mother whilst revealing his conflicted feelings towards his only son. His legacy as etched in these documents places the Raoux family and Marcel Auguste in particular, at the heart of the development of the French horn.

Alastair Laurence

The Façade of Prestigious Piano Names and the Giant Underbelly of London Piano Manufacture 1890–1990

One of the fascinating curiosities of London piano making in the period 1890–1990 was the way in which companies, in the face of a slowly shrinking industry, amalgamated their resources. Designs and construction methods were transferred from one factory to another by an inner core of highly talented and skilled individuals who were working very much ‘behind the scenes’, well away from the view of the general public.

Yet at the same time, a cult of the retention of old pianos makers’ names was vigorously maintained by the surviving manufacturers. This was an attempt to convince the piano-purchasing public that nothing had really changed, and that the individual qualities of time-honoured brands was being maintained. To a large extent, the public were being hoodwinked.

Among the firms to be considered in this paper are Kirkman, Hopkinson, Rogers, Challen, Brinsmead, Cramer and Chappell.

Susana Caldeira, Adriana Rizzo, Federico Caro

A Material Analysis of the Hans Ruckers Double Virginal of 1581

Conservation science is in a privileged position to contribute to more detailed knowledge, contextualization and conservation of historical musical instruments as works of art. An example of this contribution of science is the examination of the double virginal built by Hans Ruckers in 1581, which has been in the collection of The Metropolitan Museum of Art since 1929, with the accession number 29.90. The goal of this paper is to bring to light the most recently found results and the analytical methods used regarding the material characterization of this instrument.

The study was possible thanks to an interdepartmental collaboration, between Objects Conservation and Scientific Research. The analyses were performed with equipment at The Metropolitan Museum of Art. The analytical methods used in the investigation include energy dispersive x-ray fluorescence spectroscopy, microscopic wood identification, X-ray diffraction, and X-ray radiography.

While the results lead to a better understanding of this work of art in particular, it also opens doors for new research, to establish new connections between this and other studies. Hopefully the results presented can be useful for others who devote their time bridging art and science as ways to further developments in organology, or to inspire many about the great resource of information that a musical instrument can be.

Patrícia Lopes Bastos

Drawing and imaging techniques applied to musical instruments

The advantages of technical drawing and imaging are highly valued in the scientific study of musical instruments. Similar to the advance in direct image quality, drawing has reached new platforms of expansion, including the use of 3D computer graphics, with X-ray type of view and animation. These visual representations are increasingly used not only for expert research but also for museum exhibitions. They help to give an immediate and complete depiction of the object and of how it works, especially useful in the case of complex mechanical systems. It is thus considered that the utilization of multimedia and complementary image and audio techniques are effective tools to reach the general public. In this paper we present a selection of drawing and imaging techniques with practical examples. Visual perception methodologies are suggested, focusing on current computer applications which can provide solutions for the diverse objectives of those who deal with musical instruments.

Peter Holmes

The Etruscan Lituus: Its Design, Manufacture, Symbolism and Preservation

The lituus is one of the brass (lip-reed) instruments used by the Etruscans between 800 and 100BC. Its importance for study lies in the sequences in manufacturing technology, organology, design and ritual adornment which extant instruments demonstrate and in the links which these establish with wider cultures.

The challenges involved in the creation of litui in the original materials and using original processes have necessitated repeated visits to investigate the material and has thrown new light on the manufacturing technology of Etruscan musical instruments. In particular, it has revealed links between elements of design and the techniques employed in manufacture.

The benefit to be gained from studying instruments which are newly found or have been stabilised rather than embellished for display is discussed and the advantages demonstrated.

Relationships between the ritual adornment of these instruments and those of neighbouring and successor societies are discussed. The relative merits of the physical evidence and iconography in identifying such relationships are considered and the extent to which these assist the researcher in the Etruscan context is outlined.

The current state of the replicative work will be demonstrated.

Stewart Carter

Silk and Bamboo on Steroids: The Search for a Bass Voice for the Traditional Chinese Orchestra

The so-called traditional Chinese orchestra is a relatively recent development. It is a growing phenomenon, with at least five full-time professional ensembles and countless student groups in the People's Republic of China today. The orchestra combines Eastern and Western elements: its core consists of bowed string instruments of the erhu family and also includes sections of such instruments as pipa, ruan, sheng, suona, dizi, and percussion. But almost all of these orchestras use Western-style cellos, basses, and even harps as the foundation of the string section.

My paper focuses on experimental efforts to extend certain traditional instruments into the bass range, for use in the Chinese orchestra. Such instruments include the gehu (essentially a bass erhu), including exemplars built by the Shanghai No. 1 Musical Instruments Factory as well as some cello-inspired instruments used by the Hong Kong Chinese Orchestra; larger sizes of suona, built by the Wushi Factory near Beijing; and also larger sizes of sheng, built by the Suzhou Musical Instrument Factory. Finally, my paper demonstrates how and why some of these newly developed instruments have found a home in the Chinese orchestra, while others have largely been abandoned.

Anne Houssay and Priscille Lachat-Sarrete

History, technology and culture: a case study of violin metal bows by Vuillaume and Heddon

The *Musée de la musique* keeps two metal bows that Jean-Baptiste Vuillaume made in the middle of the nineteenth century. Roger and Max Millant have written about them, telling how this renowned violin maker and dealer had 500 hollow steel bows made each year from 1834 until 1850. This paper considers some of the remaining metallic bows, the technology involved, and describes the technical and economic context in which they were made. The fact that this bow was not patented by Vuillaume is discussed and the opinions of musicians are discussed to explain the reasons for their temporary success. This production will be compared to that of metal bows made in the USA in the 1940s.

This case study will enlighten how a scientific approach to the identification of material, a history of technology point of view for their manufacture, and a look into the cultural background in which the violin family bows were being used help us today in explaining a temporary production. All approaches are necessary to find the reason why this bow could be seen as 'progress' in bow making in the middle of the nineteenth century, when in fact it ended up as an ephemeral invention that failed to replace the classic *Pernambuco* wood violin bow.

Graham Hair, Nick Bailey, Alex South and Bill Evans

The Yamaha WX5 and Microtonal Performance

Roger Heaton's chapter 'The Contemporary Clarinet' (in *The Cambridge Companion to the Clarinet*), says of 'The recent Yamaha Digital Wind System' that 'These instruments.....are good in jazz and pop.....but have yet to find a home in classical new music'. We document some steps toward making good this lacuna. We describe a project in which we adapted the system to make it capable of performance by a professional clarinetist in music based on the '19-ET' scale (19 pitch classes per octave): just one of its many microtonal possibilities. Our objective was not just to build the instrument, however, but to produce music exploiting approaches to composing music for it which are idiomatic and 'native' to 19-ET. We also consider the instrument's affordances and the extent and limits of its playing-techniques.

Finally, we discuss the performance of a new piece for our 'Adapted Wind Controller', highlighting all the relevant issues as specifically as possible. Elements of composition, performance, engineering and computing were involved, and we describe how inter-disciplinary, multi-disciplinary and cross-disciplinary collaboration was required to achieve the envisaged outcome.

By way of postscript, we consider why the building of microtonal instruments is still such a problematic issue in a contemporary ('high-tech') society like ours.

Michael Fleming

Putting early English viols in their place

Records of viols in early modern England are numerous and well-known. They are largely found among the copious documentation of the royal court and in the archives of the London and country residences of the nobility. This encourages a tendency to act as if these places represent the span of where viols were owned, used and, by extension, made. Around the country, however, are fragmentary records which show that users and owners of viols were geographically widespread and came from diverse sectors of society. Similar evidence shows that viol making was far from restricted to London, and that the essence of non-London makers is that they were versatile rather than specialist. I will explicate the distribution of viols and their makers, and suggest that if so many London records had not been lost (for example, in the 1666 fire), the characteristics of early London viol makers might be seen to mirror those of their provincial contemporaries, rather than relatively well-documented London makers from later times, who are often assumed to present the best model. This has implications for the nature of the majority of early English viols, which are lost.

John Bryan

‘Musicke of great compasse’: analysis of range and register in the hunt for the Tudor viol

In the Epistle to the Reader of his 1588 *Psalmes, Sonets, & songs of sadnes and pietie*, William Byrd distinguishes between the wider ranges of pieces originally conceived for instruments and solo voice and those ‘of smal compasse & fit for the reach of most voyces’. By exploring the notated pitches of untexted parts in pieces from across the Tudor period it is hoped that light may be shed on the ranges and registers most commonly used by sixteenth century composers of ‘instrumental’ music; how they combined these to create effectively varied musical textures and harmonic sonorities; and what this might tell us about their expectations of the viols that would have been perhaps the prime candidates for performing this repertory. By analysis of pieces from across the period, it will be possible to trace constants or changes in instrumental usage. Case studies will therefore focus on music from the early Tudor court (including pieces from the so-called ‘Henry VIII’s Book’ (London, British Library Add. MS 31922) and *XX Songes* (1530), the *In Nomines* of Christopher Tye, selected works by Byrd, and the published dance collections of Antony Holborne (1599) and John Dowland (1604).

Matthew Spring

The Bass Viol in the Mixed Consort

A glance at the only surviving printed part-book for the bass viol from the set mixed consort books of Thomas Morley (1599/1611) is rather a disappointment. Here the role for that instrument is largely limited to that of sustaining the bass line of the lute, especially in the repeated passages where the lute is given elaborate divisions. However the manuscript books for the Walsingham Consort Books and more particularly the Cambridge Consort Books associated with Mathew Holmes and Richard Reade reveal a more varied role. In some piece, and especially those of Richard Allison and Daniel Bacheler, the bass viol alternates with the bandora in providing a bass line for subgroupings among the remaining four instruments. As Sydney Beck pointed out in the 1959 introduction to his edition of Morley's Book, there are a few pieces, notably *Lachrimae Pavin* and *James, His Galliard* in the Cambridge Consort bass viol books that give alternative elaborate divisions for the bass viol. This paper explores the musical roles the bass viol is given in the surviving sources of mixed consort music, and considers how the bass viol player might supply simultaneous divisions to enliven the more mundane bass lines of much of the surviving repertoire.

Nicholas Mitchell

Woodwind pitch and the Tudor Bass Viol

Studies of the viol consort have tended to shy away from the evidence of surviving woodwind instruments and from defining an exact pitch for performance. The viol consort was almost universally at a pitch much lower than 415Hz, approximating to one a minor third lower than that. The 'tunings' of contemporary treatises are indications of transposition from this core pitch which is identical to the reference pitch found on harpsichords exported all over Europe. For a full consort the larger type of Bass viol would always be used. Correlation of vocal, woodwind, brass and particularly Praetorius' evidence give very little room for variations in pitch for a viol consort set to the specifications found in the sixteenth and seventeenth centuries. This paper reviews recent contributions to the study of viol pitch while expanding the paragraphs on the topic I wrote in *GSJ* LIV (2001).

Murray Campbell, Patsy Campbell and Jim Woodhouse

Comparative studies of the acoustical response of modern reproductions of viols and other early bowed string instruments

Admittance measurements at the bridge have been made on a wide variety of reproductions of viols and other early bowed-string instruments. The results can be compared with existing data on modern violin-family instruments, and also other stringed instruments such as guitars. As one might have guessed, the results reveal that the acoustic behaviour of viols is more disparate than that of violins or guitars:

plots will be shown to illustrate this range. Even if attention is restricted to treble viols, the models that have been measured include examples with and without a soundpost, and with body forms including a speculative 'Costa' pattern, and a correspondingly wide range of frequency responses is seen. The influence of the viol bridge will also be discussed: the results indicate that viols do not in general exhibit a 'bridge hill' as marked as that of the modern violin, but that some models show the beginnings of such a feature. The bridge hill is well known to give a resource for sound adjustment in violins, and the same may prove true with some designs of viol bridge.

Martin Kirnbauer

Sylvestro Ganassi's 'viola d'arco tastada'. Report on a research project on its contextualisation and reconstruction

Two years ago an interdisciplinary research project concerning early string instruments around 1500 started at the *Schola Cantorum Basiliensis – University of Early Music* in Basel (with the participation of musicologists, organologists, art historians, specialised performers and instrument makers). Part of its program was the hypothetical reconstruction of instruments. In a first step the research concentrated on the Italian viol. Because original instruments of this time are rare or heavily disputed, the decision was to base not on an 'original' instrument, but on the descriptions and illustrations in a well-known publication for the viol: Sylvestro Ganassi's *Regola Rvbentina* (published in Venice 1542 resp. 1543 in two volumes). This decision offered several advantages: the possibility of a clear contextualisation of the viol and its use, a defined musical repertory and its musical demands for the viol, the concentration on only one 'type' of viol etc. New insights in the biography of Ganassi and the context of his publications helped to establish a firm basis for an evidence-based reconstruction of an Italian viol, completed by a critical iconographic research and the examination of some original instruments from the sixteenth century.

Kathrin Melanie Menzel

Ganassi and the Viol – Remarks on the Constructional Elements of Surviving Instruments and Iconographical Sources

Led by the question of how a viol was constructed in Ganassi's time, the Basle research project concerning early string instruments included organology and art history. The question of *typical* constructional elements involved the organological examination of sixteenth century viols in Leipzig, Lisbon, Vienna and Nuremberg. Recent advances in technology and academic studies have brought new data to the documentation of such previously-studied instruments. A critical interpretation of iconographical sources considering the type of art work, technique and even its functional and social context also brought new aspects to light. Can a close look at these new details and the instruments themselves find similarities that form *typical* constructional elements, within which diverse *regional schools* of viol building can be identified? The neck-body connection, the ribs, the top thickness allocation and outer

shape are indicators that give particular hints of what may have been a viol-making 'default' in several areas of Ganassi's Italy.

Thilo Hirsch

An evidence-based reconstruction of an Italian viol after Ganassi

The concerted research on written and iconographic documents (including the development of an iconographic database of early string instruments) around S. Ganassi's *Regola Rvbentina* (Venice 1542 and 1543) and the examination of several original string instruments mostly from the second half of the sixteenth century in several museums lead to the development of an evidence-based method for a hypothetical reconstruction of a viol after Ganassi. One of the crucial points was the striking (asymmetrical) thickness of the top as found in iconographic sources as well as on original instruments. When the defined model – with an asymmetric top and without soundpost and bass bar – was designed, simulations on a computerized 3D-model demonstrated its acoustic relevance. Then three instruments were built by three different specialized instrument makers to document the influence of the personality of each maker. The resulting instruments were tested by playing the original repertoire and in various casts to explore their musical properties. The paper will include a practical demonstration of the reconstructed viol.

Bruno Guastalla

Reading old musical instruments

While it is evident that most objects bear the marks of their use, traces of their journey through time remaining as clues inscribed in their fabric, old stringed instruments can be surprisingly coy and tricky to read for a variety of reasons.

Use, wear and tear, damage, the need for repair, the need to conceal repairs, adaptations or transformations to suit the needs of a specific individual or reflecting stylistic changes and fashions, commercial pressure and even pure experimentation, may all act upon these instruments. To what extent can one construct a valid history of an instrument from the sometimes contradictory clues which are now evident? This crucial question is ever-present, and should be constantly in the minds of restorers, conservators, collectors, historians and musicians.

This paper will closely examine some examples of old instruments from the violin family, and discuss some of the readings and mis-readings which may be made. This should stimulate and promote understanding and debate about the nature of these important artefacts.

Claudio Canevari, M. Malagodi and T. Rovetta

Studies and analysis on the fragments of a bass viol signed *Joannes Marcus* (Northern Italy, second half of sixteenth century)

Fragments of a bass viol signed *Joannes Marcus*, with a paper label on the inner side of the back plate, are conserved at the Conservatorio 'G. Verdi' of Milan. It was shattered in 1943, when part of the Conservatorio was destroyed by a bomb. Many characteristics of this viol seem typical of Northern Italy in the second half of sixteenth century. Little is known about *Joannes Marcus* who probably lived and was active in the Emilia-Romagna area; other instruments possibly made by the same maker were identified. A poor quality B/W picture of the bass viol is in the 1908 catalogue of the Museum of the Conservatorio 'G. Verdi' by E. De Guarinoni and few mentions of it are in some lutherie dictionaries. The viol was restored and modified when it was still intact: the fragments of the top plate are probably not original and there are traces of a questionable non-original varnish coat and spurious painted decorations. At the Laboratorio Arvedi of the University of Pavia the fragments were submitted to a complete protocol of scientific investigations, both non-destructive and micro-invasive, including advanced instrumental techniques (XRF, visible light and fluorescence microscopy, FT-IR, SEM-EDS) in order to characterize the original materials and to identify the recent modifications.

George Stoppani and Oliver Webber

Gut strings: industrial archaeology re-enactment

The case for equal tension being the guiding principal for stringing bowed instruments before the late 1700s is very strong. It is supported by several clear textual references, a much larger body of iconography and some surviving fittings. For lutes there is a different collection of textual references which do not explicitly mention string tension or diameter; the basis for choosing diameters is how they feel to the player. Likewise there is iconography and surviving parts of instruments but more scope for different interpretations than with bowed instruments. The authors have been making strings from sheep gut for around 20 years. Many thousands of strings have been supplied to professional and amateur musicians. While it is possible to construct accounts of historical stringing practice solely from the assorted evidence it is also necessary to validate the theory through practical experiments. A counter argument could be raised that a modern musician finding a product satisfactory is not proof of authenticity; there are examples of modern products that have gained acceptance but are historically improbable. Given that there are regional differences in instrument construction and progressive modifications over time we naturally expect there to be corresponding differences in stringing practice. Whereas a highly plausible approach has been developed for a generic style for stringing viols and violin family instruments with all-gut, equal tension there is a need to be more specific to a time and place, a repertoire or individual musician. There are indeed some items of evidence that indicate such differences: certainly enough to whet our appetites and prompt further research. Stringing and setup tend to be a package. Some knowledge of the physics of bowed strings and instrument acoustics are helpful in understanding

how such details as neck geometry, bass bar size and bridge design integrate with string types and tensions.

Alison Crum

Early viol stringing and its relevance for performers today

The last 40 or so years have produced much research into the types of strings available to sixteenth and seventeenth century viol and lute players. Although most players these days are keen to have an instrument copied from a famous maker of the time, hardly any adopt the use of all gut stringing to play music which was composed long before the idea of covering strings with various metals had been invented.

A few devotees of gut stringing have had some influence in ‘converting’ their colleagues and friends, but there are still vast numbers of players who do not consider using all-gut bass strings. Is this because ‘modern’ ears do not like the dry and scratchy sound, and prefer to hear their viols sound more like baroque models recorded in a cathedral acoustic? Or because they are less easily available, or harder to play on? Perhaps the sound is too quiet for big concert halls? Based on my 35 years of playing on a variety of all gut strings, I will discuss the pros and cons of ‘authentic’ stringing, and its relevance to today’s early music world.

M. Emin Soydaş

The Turkish *Kopuz*: True Identity of a ‘Legendary’ Musical Instrument

The term *kopuz* (with some variants) has been a common generic name used by Turkic peoples for several kinds of musical instruments, especially lutes. Owing to some twentieth century publications, however, *kopuz* came to be recognized in Turkey as the ancient and foremost musical instrument of Turks who had used it in Central Asia and brought to Anatolia. The features of the instrument are often ambiguous in these works, although it is almost always described (without any evidence) as the prototype and direct predecessor of *bağlama*, the most prominent instrument of Turkish folk music. In fact, despite some similarities with *bağlama*, the Turkish *kopuz* was definitely a distinct plucked lute that existed within the Seljukid and Ottoman traditions. It was used until the eighteenth century when it became extinct together with its name. Contrary to the fact that *kopuz* and *bağlama* were concurrently in use as separate instruments, the so-called argument of transformation and succession has gained wide acceptance and even led to assuming that *kopuz* and *bağlama* are synonymous, a misconception that still prevails. This paper introduces the history and clarifies the identity of the Turkish *kopuz* and its relationship to other instruments.

Owen Woods

‘The Bolivian Charango, an Acoustic Study’

After the Spanish invasion, the indigenous Andean peoples adopted and adapted certain Spanish customs, including their musical instruments. The focus of this paper is one such instrument – the Charango, a small plucked chordophone found all over the Andes region. Formerly an exclusively *campesino* (peasant) instrument, it has now been adopted by the urban-dwelling *mestizo* as a symbol of identity. As such, they have altered the design of the instrument to suit their own musical preferences. Acoustic analyses provide a crucial link between the ethnomusicology of an instrument and the physical characteristics. This study compared five different Charangos of both *mestizo* and *campesino* origin, together with a Ukulele, Timple and Guitar. It was found that the Charangos were more similar to each other than to the other specimens tested, showing that the Charango may be thought of as a distinct instrument. The acoustic characteristics of the Charango were then matched to the construction, meaning that the differences in sound between *mestizo* and *campesino* forms of the instrument could be explained analytically. By matching the acoustic analysis (and therefore the construction) with the ethnomusicology of the instrument, the differences in construction between the two forms can now be explained.

Darryl Martin

The ‘Petrus Rautta’ cittern in Vermillion - a unique survivor, and a time identified?

In New York, 2007, a musical instrument auction sale included an early cittern, described as English, sixteenth century. Such an instrument should be a major acquisition in which many people and institutions were likely to wish to obtain. This was apparent when – despite a low estimate placed on it – it was the subject of fierce bidding, eventually selling for many times its estimate.

Now in the National Music Museum, Vermillion, it has been well documented by museum staff, but remains contentious in a number of regards. Following the museum’s documentation it is attributed to the unknown Petrus Rautta, England, 1579, from a reading of the (much damaged) label. As such it is the only surviving English ‘renaissance’ cittern of any type, one of only three early-English wire-strung instruments, and the only surviving example of a ‘klein Englische zitterlein’ (Praetorius, 1618) from any country.

This attribution has not been universally accepted, but this paper will both discuss the organological importance of the instrument, and, by comparison with other English instruments of differing types – as well as recently discovered iconographical evidence – show that the proposed date is, in fact correct, and suggest a social circle of original ownership.

Bonnie Blackburn

News on the Rialto: Sigismondo Maler and Nicolò Sconvelt

Little is known of Sigismondo Maler, brother of the more famous Luca (Laux), lute maker of Bologna, apart from the desire of the Duke of Ferrara to obtain from ‘Il magnifico Sigismondo Maler Thedescho’ his recipe for lute varnish. Although the Ferrarese ambassador reported that Sigismondo was a rather bizarre character, he nevertheless yielded the recipe and was recompensed with a gift of mortadella and eels. Anything more about him, apart from the fact that he was in Venice from at least 1514, has been a matter of speculation. The chance discovery of his will of 1532, witnessed by Vincenzo Capirola, allows us to fill in some details about his career, family, and workshop. New information also allows us to identify, as I propose, the lute maker Nicolò Sconvelt as the lutenist portrayed in Gentile Bellini’s *Procession in San Marco* of 1496 and in Lazzaro Bastiani’s *Donation of the Relic of the Cross*. Since he died in 1502, it is problematic whether he can be identified with the much later Nicola Schönvelt whose ‘old lutes’ appear in the Fugger inventory. No examples of his instruments have survived, but the lutes in the two paintings are surely of his manufacture.

Lewis Jones

‘La pù bela cosa de Italia e el melio’: visual and sonic beauty in Renaissance musical instrument making

This paper examines references to beauty, loveliness, harmony and other admired attributes, chiefly in several of the 182 extant letters which passed between Lorenzo Gusnasco da Pavia (*d* 1517), musical instrument maker to Pope Leo X, Lucrezia Borgia and the Estensi (Ferrara), the Sforza (Milan), the Montefeltro and della Rovere (Urbino) and, from our point of view, his chief patron, Isabella d'Este Gonzaga of Mantua (1474–1539), with whom he corresponded frequently about artistic and commercial matters between 1496 and 1515. Lorenzo's often bold claims in regard to the beauty of form, materials, decoration and, occasionally, of the sound of his instruments, which are to some extent corroborated by contemporaries, are considered in relation to aesthetic judgements he made in his other main role, as agent, adviser and intermediary in the acquisition and discussion of antiquities and of works by fine artists including Bellini, Leonardo da Vinci, Mantegna, Perugino and van Eyck.

The design of Lorenzo's one extant instrument, the paper-piped positive organ of 1494, now in the Museo Correr, Venice, is considered in relation to documents which refer to it or similar instruments, and to other documented and extant instruments of the late fifteenth and early sixteenth centuries; and conclusions are drawn regarding sensori-emotional preferences in the relation of sound, form, decoration and associations in Italy in the years around 1500.

Sabine K. Klaus

A Serpent Made of Leather Only? The Bologna Serpent No. 1829 and Its Historical Significance

The origin of the serpent in France or Italy and its supposed invention in *c*1590 by Canon Edmé Guillaume from Auxerre has been a matter of debate since the late nineteenth century. More recently, this discussion has been revived by Herbert Heyde, who argues that the serpent is a product of the Italian Renaissance and therefore more likely of Italian rather than French origin. On the other hand, François Auzeil has lately unearthed documents that appear to support the credibility of Auxerre's role in the early history of the serpent.

An instrument that appears to play a pivotal role in this discussion is the serpent no. 1829 in the museo internazionale e biblioteca della musica in Bologna. This serpent was first described by John Henry van der Meer, who dismissed it as a stage prop. However, a recent examination reveals that it not only shows a sensible arrangement of the fingerholes, but also considerable wear. The unusual design of this serpent, skilfully made entirely of leather without a wooden core, suggests a place of origin where such skills flourished, for example in Venice.

John Koster

The Harpsichord Actions of Henry Arnault de Zwolle in their Developmental Context

Several plucking actions are described in Henry Arnault's treatise, circa 1440, which was composed partly after preexisting material, partly from his own invention. Some of the actions would have been older than the others. Called 'better' than the other plucking actions shown next to the *clavisimbalum* plan, the first (leftmost) was the most recently developed. Requiring key levers of the first order and incorporating a pivoted tongue with a small plectrum, it is closer than the others to the action of later harpsichords. Even closer, a keyed-monochord action, on a slip of paper inserted into the treatise, is a later development eliminating the first action's superfluous intermediate lever. The third action, incorporating a pivoted tongue but with an organlike key lever of the second order, antedates the first. The second action, with a second-order key lever and a plectrum resembling a gear tooth or a crossbow's trigger mechanism, is evidently the oldest. The resemblance of the leverage to that of the bell-striking mechanism of clocks, alongside the similarity of the tone of high-pitch metal strings to that of high-pitch bells (*cymbala*), suggests that this action stemmed from the 1390s, when Hermann Poll developed and named the *clavicembalum*.

Rachael Durkin

Neither English nor a viola – the Englische Violet undressed

Often overlooked as an anomaly of the viola d'amore family, the englische violet, or viola angelica, may be the missing link between the baryton and modern viola d'amore. With no iconographical, and little literary or printed music sources surviving, it has been suggested that the englische violet's larger size and greater number of sympathetic strings were employed to create a viola d'amore with a stronger tone. However, with a longer string length and similarities to the octave baryton, it can be argued that the englische violet is a separate instrument, initially coexisting alongside the original wire strung viola d'amore during the seventeenth century. Made predominantly in the Alpine region of Germany and Austria, the englische violet was most likely an instrument for the wealthy with its elaborate festooned outlines and carved pegboxes, as seen on extant examples today. With particular focus on the instruments of Paulus Alletsee of Munich, this paper looks to undress the englische violet, and examine its relationship to the baryton and viola d'amore, establishing its position within the sympathetic string family.

Panagiotis Pouloupoulos and Rachael Durkin

'A very mistaken identification': The History of the 'Sultana' or 'Cither viol'

The origins and development of the 'sultana', or 'cither viol', constitute an organological enigma. The few references in the relevant literature describe the 'sultana' as a wire-strung type of viola d'amore with no sympathetic strings, while pointing out its connection to the wire-strung guitar, commonly known as the

‘English guittar’. In addition, many authors have suggested that the ‘sultana’ was invented in the 1760s by Thomas Perry of Dublin, who was arguably the most prolific maker of this instrument, even though similar bowed instruments had been earlier produced by Frederick Hintz. Under the hands of Perry and other makers, the ‘sultana’ presents itself as a beautiful and refined instrument, presumably constructed for those of the upper classes and made exclusively in the British Isles. However, despite the considerable number of extant ‘sultanas’, no printed music and no literary or iconographical sources of the instrument dating from the eighteenth century seem to have survived. This paper will analyse new evidence that has come to light, providing new details on the manufacture, trade and musical role of the ‘sultana’ and aiming to reveal the unexpected true identity of this forgotten instrument.

Hayato Sugimoto

Separation between invention and making in Regency Britain: the case of Edward Light

Edward Light is known as an inventor of the harp lute, which is a nineteenth-century hybrid instrument, originally combining guittar with harp, and popularly used in England. Interestingly, though he invented many different models of harp lute and was even granted a patent, his profession was mainly that of a musician engaged in teaching at his music academy. Numbers of extant instruments bear an inscription ‘Barry Maker / Light Inventor’. Alexander Meek Barry has been identified as a maker who built instruments for Light. However, for Light’s later models such as the harp-lute and the dital-harp we have no indication of the maker, only the inventor’s name and address. It seems that the identification of the maker became less important to customers. Two later inventors, Mordaunt Levien and Angelo Benedetto Ventura, also inscribe instruments with only their own identification.

Why did musician inventors of new instruments become more important for customers? This paper will discuss the business model of nineteenth-century musical instrument making in England as a case-study, focused on the development of harp lutes. The conclusion will demonstrate the role of musicians and makers in instrument design.

Douglas MacMillan

The English Flageolet

The English flageolet arose at the beginning of the nineteenth century as a combination of the alto recorder and the French flageolet. Controversy has arisen in the literature relating to the relationship between the flageolet, the csakan and the recorder during the nineteenth century, and this matter is explored and defined.

In 1803, William Bainbridge registered a patent which introduced radical changes in the English flageolet, in particular by changing the fingering of the tonic from the

sixth-finger note to the third-finger note and by simplifying the fingering. These changes underlie the development of his double flageolet and triple flageolet and are discussed in this paper together with the various anti-condensation mechanisms contained within the windcap of the instrument. After the middle of the century the English single flageolet underwent further changes and, in the light of the observed development of the English flageolet, a new classification of the instrument is proposed.

Further patents registered by Bainbridge introduced the transverse flute-flageolets to cater for those unable to master the German flute.

Finally, brief note is made of the developments in the French flageolet, and of the flageolet within the context of nineteenth-century musical activity.

Allen Roda

Tablas Past and Present: Making India's Most Iconic Drums

Tablas are harmonically complex, tonally rich sets of drums used in a variety of North Indian music genres ranging from film, folk, and fusion to the devotional music of Hindus, Muslims, and Sikhs alike; however, they are perhaps most well known for their role in Hindustani classical music, both as accompaniment to vocalists and instrumentalists and as a solo instrument. This paper takes a close look at tabla construction comparing contemporary practices with analysis of historical instruments at the Metropolitan Museum of Art in New York. Building on recent fieldwork in India apprenticing with wood workers, metallurgists, leather workers, and tabla makers, I use my experience with contemporary tabla construction as a foundation on which to speculate about historical instrument making practices based on analysis of the museum's collection. There are very few extant nineteenth-century tablas with verifiable dates of manufacture; however the Metropolitan Museum of Art has one instrument which has been in the collection since its foundation in the 1890s. Using the correspondence between the founder of the Met's musical instrument collection, Alice Crosby Brown, and her dealers, this paper presents a case for one drum in particular to be viewed as emblematic of nineteenth century tabla construction.

Geerten Verberkmoes

The working methods of violin maker Benoit Joseph Boussu (1703–1773): assessing a proposed making sequence by building a copy

My recent article 'Benoit Joseph Boussu (1703–1773): Violin Maker and Notary' (*Galpin Society Journal* Vol. LXVI, 2013) describes research performed on seven violins and two cellos made by Benoit Joseph Boussu, who was active in Liege, Etterbeek and Brussels, c1749–c1760. Boussu's instruments incorporate constructional elements from both local, archaic traditions (most prominently the 'through-neck' construction) as well as from foreign, more contemporary origins. Based on these observations, I have proposed a violin construction sequence for this maker.

In addition to the research described in the above mentioned *G.S.J.* article, physical violin copies were built, in order to learn more about the efficiency, practical aspects and challenges of the proposed working method. The current paper illustrates the various stages of these building experiments, discusses the practicability of the employed operations and evaluates a resulting copy in comparison to the Boussu originals.

Marie Kent

Fire at the Workbench: burnt tools and lost jobs in the London piano industry (1789–1900)

An eye-witness to the ‘fire of extraordinary magnitude’ that burnt the Broadwood factory in Horseferry Road, Westminster, on 12 August 1856, grieved that ‘it was lamentable to observe the workmen looking on – their eyes suffused with tears – at the destruction of their valuable tools’. Often inherited from their father, amassed and crafted over a lifetime, and routinely stored on the premises overnight, the tools of a Broadwood workman were valued at between £60 and £70, and though many were insured, a great number were not. The same was true elsewhere in the industry, despite the flammable nature of materials used in the workshop, and many hundreds of men who failed to insure their tools were thrown out of work when their premises burnt.. With no means of performing their work, how did they survive a sudden loss of income and return to their former position? A study of the national press examines the causes and consequences of 46 fires in the London piano industry in the eighteenth and nineteenth century, and the measures taken by the industry to protect both the workplace and the workforce, and restore productivity.

Karen Loomis

The Montgomery Tuning Pins: A significant rediscovery in context

In the spring of 2012, a copper-alloy tuning pin of the type used in Irish harps of the historical period was brought to the attention of the author. This tuning pin belongs to a set of twenty-four discovered in 1967 during excavations at Montgomery Castle in Powys on the Welsh Marches. They were described in *Archeologia Cambrensis* (1994) but remained unknown to researchers of the Irish harp. Comprising a matched set in apparently unused and nearly pristine condition, they are unprecedented amongst surviving Irish harp artefacts.

This set of tuning pins provides a unique opportunity to examine, in its original state, a portion of the craftsmanship employed in the construction of Irish harps. They will be discussed within the historical context of Montgomery Castle and its principal occupant prior to its demolition in 1649. Comparisons will be made to other surviving, but extensively worn, Irish harp tuning pins of similar design and the Montgomery pins will be discussed within the context of surviving Irish harps of the seventeenth century.

Dorota Popławska

Recorders from the Polish Archaeological Investigations

There are six recorders in the Polish archaeological collections. Although all of them were discovered during the last 50 years, only a study of the Recorder of Elbląg has

been published and the information on the other recorders still awaits academic publication. The instruments can be dated as: fourteenth century (Nysa Recorder), fifteenth century (Płock, Puck Recorders) and sixteenth century (Elbląg, Warsaw and Toruń recorders).

The construction of these instruments is similar to the recorders found at different European sites: Dordrecht, Amsterdam (the Netherlands), Göttingen, Esslingen, Würzburg (Germany) and Tartu (Estonia).

The main task of this paper is to gather, present and study the sound scope of Polish recorders. It will depict the basic sound and the size of the intervals. Comparison of the results obtained from the examination of the Polish recorders, sometimes combined with the European recorders data, as well as the consideration of the construction time, will allow us to penetrate the musical sphere of recorders. It will also allow us to form the preliminary research outcome of the musical scales of recorders and the musical sphere of the examined period.

Mike Baldwin

Patents, Politics and Personalities: the Mechanisation of the Harp 1794–1845

A period of innovation in harp design and manufacture followed the relocation of Sebastien Erard (1752–1831) from Paris to London in 1792. Through an examination of twenty-one patents registered in London by fifteen makers between 1794 and 1845, this paper traces technical developments, revealing an increasingly innovative, mechanised, competitive and expanding industry. The key protagonists and the relationships between them, and the scale of their production, are examined with reference to trade directories and other evidence.

The impact of political unrest and border closures between England and France on harp development is assessed, revealing hitherto unrecognized agents of innovation, including clockmakers and other craftsmen displaced by the French Revolution. Although the shift of the centre of harp production from Paris to London – itself in the grip of revolution, but here industrial – is marked by the ready availability of Erard's new harp in comparison with the scarcity of new French instruments, it is argued that the double-action instrument, in particular, was initially slower to take off than has previously been claimed by Roslyn Rensch and other commentators.

Olesya Rostovskaya

From Gadget to Instrument: Repertoire capabilities and the performance 'biographies' of electric musical instruments collected at Glinka National Museum Consortium of Musical Culture

In the age when electricity became generally available and controllable, electric musical instruments began to appear. However, alongside delight in their novelty, the new instruments engendered a sense of skepticism among some people: why do we

need all this gadgetry if we already have everything we need to perform music? Every such gadget instrument had to *prove* its right to existence, its right to repertoire, its right to be called a *musical instrument* and not just a *gadget*.

Using the examples of the ANS synthesizer and the termenvoks (theremin), we will look at the factors that helped and continue to help these devices to occupy their rightful place among musical instruments. In this respect, special attention should be given to the role played by the inventor, the keeper, performers and composers. Another important factor is the complexity of the instrument itself and the complexity of controlling it during performance.

It may seem paradoxical, but people who devote their whole life to electric musical instruments have to emphasize strongly the unusual and experimental nature of their instruments. As a result we perceive these instruments as a kind of stunt, rather than as serious instruments designed for the high art of music. Thus, musicians who work with electric musical instruments have constantly to improve their skill, compose music, inspire composers and raise their successors. In this case, each new concert will see fewer stunt-seekers and more connoisseurs of genuine, unique music.

Anna Borg Cardona

Malta's importation and sale of musical instruments 1800–1900

During the period of the Knights of St John (1530–1798), the cultural scene in Malta had mostly been dominated by French and Italian knights. For its sacred music and musical instruments, Malta had always looked towards Italy. By 1814 the Island had become a Crown Colony. British army and navy personnel were posted to the Islands, soon followed by their families, some of whom brought their own musical instruments among their belongings. British merchants started establishing a base in Malta's capital city, Valletta.

Early nineteenth-century records show that trade of *musical* goods was mostly being carried out with, or via, Italy, and partly with France. In the second half of the century Italian impresarios were running the opera scene and Italian bandmasters were being chosen to lead Maltese wind and brass bands. All this musical activity led to an increase in specialised music shops centred in Valletta. At the same time, trade of musical goods with Britain began to increase via London and Southampton.

This presentation will look at the musical trade taking place on the Maltese islands, highlighting some of the musical instruments which were being imported, and those which got to the islands as the property of British residents and subsequently entered the Maltese market.

Cleveland Johnson

How Indian is the ‘Indian’ Harmonium? Evidence from the Colonial Press and London Patent Office

Whereas Westerners consider the small ‘box’ or ‘hand’ harmonium an exotic musical artefact of South Asian countries, this harmonium has long been stigmatized in those regions as a ‘Western’ instrument. Unlike the sitar and sarod, the harmonium is indeed a relic of the colonial economy, for as European and American markets became quickly saturated with these household instruments, India in particular promised a fresh, new market with great profit potential.

The precise needs of native, Hindustani music could not be met by European instruments, but these provided the models for developing an indigenous harmonium. The small, portable instruments, designed for traveling Europeans playing hymns and parlour songs, would be co-opted and modified by local musicians and, eventually, built by local craftsmen. Thus, the popular ‘Indian’ harmonium, as it exists today, is a creation of two cultures; yet, truly, it belongs to neither.

This investigation explores the history of the ‘hand’ harmonium through the eyes of the colonial press and through the evidence of registered patents. Such visual documentation, following the development of the hand harmonium from its larger European ancestors (and various detours along the way), offers insight into the fertile interaction of cultures at the end of the nineteenth century.

Patryk Frankowski and Alina Mądry

A Harpsichord by Burkat Shudi - no.469 (1765) - its history and present state of preservation

In October 2011, the department of Musical Instruments at the Polish National Museum in Poznan was offered a harpsichord for purchase. After close examination it turned out to be an instrument made in 1765 by Burkat Shudi, no. 469, which had been lost during World War II. It is the earliest extant instrument of the few that this prominent English Maker built for Frederick the Great. The main aim of our paper is to present the history of Shudi’s harpsichord no. 469, from its disappearance until the moment of rediscovery, and a detailed description of its present state.

Lance Whitehead

New light on three London harpsichord makers: Benjamin Slade, John Hitchcock and Joseph Mahoon

In addition to the identification of a number of previously unrecorded harpsichord makers, the examination of all available insurance registers of the Sun Fire Office for the period 1710–79 has unearthed valuable information concerning many well-known

ones. Concentrating on three individuals active in London – Benjamin Slade, John Hitchcock and Joseph Mahoon – this paper will shed new light on their ancestry, places of work and financial status. Although not the primary focus, the ancestry of Hugh Mahoon, as well as the possible role played by Margaret Hitchcock in the family business following the death of Thomas Hitchcock (ii) in a road traffic accident, will also be considered.

Malcolm Rose

The Mysterious ‘1623’ Harpsichord

Many people will recognise the ‘1623’ from photographs in various books on the history of the harpsichord, and from articles published since it came to light in the early 1970s. Michael Thomas, who bought it at auction in 1972, always held that the date was genuine, while John Barnes, then Curator of the Russell Collection, believed it to be, if not a fake, at least a later instrument dressed up to look much older. A heated exchange of letters in *The English Harpsichord Magazine* ensued.

After Michael Thomas’s ownership the instrument was part of the Beurmann Collection, and its current owner is the Cobbe Collection Trust, near Guildford, UK.

During recent work to rectify the structural weaknesses of this instrument, it has at last been possible to piece together the original compass and disposition, and to work out several later changes. The original compass was the unusual DD, EE, FF chromatic to f³; when the wrestplank was replaced in order to build in a lute stop, the compass was restricted to EE to e³. Comparisons with the Ham House Ruckers and the Helmingham Hall Ruckers narrow down its provenance to early Georgian London.

Michael Latcham

The *Hammerflügel* of Ferdinand Hofmann (1756–1829) as source material for the historian of furniture

Most Viennese *Hammerflügel* are not dated and obvious criteria for establishing a general chronology for them frequently prove inadequate. Keyboard range, for instance, cannot be used because instruments of different compasses were made concurrently. Furniture style as a criterion for dating such instruments is also beset with problems: less expensive instruments were given different exterior decoration from that of more expensive ones; different styles were used at the same time and vernacular styles often dragged behind the latest models used in the city. Other, technological criteria prove more useful. Some 20 *Hammerflügel* by Ferdinand Hofmann (1756–1829), one of the first and foremost of Viennese piano makers, can be arranged in order according to their string gauge markings and their string lengths. Assuming that the later the instrument, the thicker its strings, and taking into account other corollary criteria such as hammer head sizes and bridge thicknesses, Hofmann’s

instruments not only fall into a clear chronology but also into groups of the same age. Within single groups, different members show different furniture styles, for instance the neo-Gothic and the neo-classical, synchronically. Interesting diachronic differences are also revealed: the Empire style, for instance, comes after the neo-Gothic style.

Jean-Philippe Echard

A combined approach to contribute to the study of the instruments of the violin family

The continuous use of most of the instruments of the violin family over centuries implied wear, damages, subsequent cleanings, repairs or restorations which modified their appearance and features. This contributed to increasing the diversity among instruments that would have initially shared similarities, now blurred, and, maybe, to the relatively low number of organological studies on this typology, at least in the past two decades.

This paper briefly reviews our recent work on the study of bowed stringed instruments, then focuses on potential future methodological developments: Our approach, based on the combined investigation of historical sources (such as archives of 19th-century instrument makers) and examination of historical instruments by scientific techniques (including new imaging methods), leads us to consider the possibility of sorting out some of the historical complexities which have until now prevented in-depth study of this typology. In particular, we show through case studies how crucial a preliminary deciphering of the material history of each individual artefact is to strengthening organological interpretation, and how it enriches our knowledge of the instrument in its cultural context. This might also help to understand the continuous and on-going evolution of the heritage values associated with the violin.

Sandie Le Conte, Pauline Eveno

From the Church serpent to the Ophicleide: what kind of innovation? Application of the acoustic input impedance for the understanding of serpent evolution

This paper describes an acoustical measurement technique to characterize wind instruments: the acoustic input impedance. Applied to the Serpent corpus of the Musée de la musique, the input impedance will be used as an additional descriptor to classify musical instruments. Non-intrusive and non-destructive technique which require no musician, this measurement allows assessing an instrument's pitch compatibly with the rules of conservation. The serpent can be described as a harmonic instrument when the six holes are closed, but once any hole is open, the serpent becomes inharmonic. To improve its playability, makers during the eighteenth and the nineteenth century tried to propose innovations for the serpent such as additional keys or changes in shape. Measurements of input impedance demonstrate that in spite of these innovations, the harmonicity remains the same.

Bruno Kampmann

A Classification of Pistons and Valves for Brass Musical Instruments

The numerous types of brass instrument valves are difficult to describe accurately, due to the variety of criteria and functions. The problem can be split into two parts:

1. Description of one valve independently from the others
2. Description of valve combinations

The aim of this paper is to treat point 1 and propose a rational classification of valves.

For one valve, several criteria are independent from one another, and each criterium combination gives a type of valve. The main criteria are the detailed function of the valve, the nature of the moving part and its axis (translation, rotation), the nature and position of the spring if needed, and the number of linked tubes and internal shells. This paper attempts to describe these criteria and to give examples of valves, with an account of their efficiency and the reasons why they survived or not. Not all cases can be examined in a short presentation, and a more exhaustive article is planned.

Adrian v. Steiger

The Swiss wind instrument makers Hirsbrunner and their valved trumpets of 1817

Hirsbrunner has been a prominent Swiss family of wind instrument makers since the late eighteenth century, comprising 18 makers extended over eight generations and three different companies, delivering all kind of wind instruments to civilian bands, the army and soloists. Research by the author reveals a new picture of the Hirsbrunners, drawing on studies in archives and of extant instruments made up to c1930 (c50 woodwind and c200 brasswind), mostly in Swiss collections.

The paper will summarise the development of the Hirsbrunners in the nineteenth century, concentrating on their beginnings of valved brass instruments making. Most of these early valved trumpets and horns are equipped with double-piston valves, some with angular valve slides, moved by different kinds of mechanisms. Evidence will be presented which identifies the valved trumpets delivered by Hirsbrunner to the army as early as 1817 (claimed by Leutenegger, '200 Jahre Instrumentenfabrikation in Sumiswald', *Glareana* 10, 1961, p.2; cited in Waterhouse, *The New Langwill Index*, p.176) as ... something quite different.

Soren Green

The development of the Viennese clarinet 1770–1810

This paper is a study of the development of the Viennese clarinet at the end of the eighteenth century. The clarinet was born around the turn of the eighteenth century in Nuremberg, but it came of age in the late eighteenth century in Vienna. Between the 1770's and 1800 the clarinet went from a common auxiliary instrument, familiar but not ordinary, to a prominent place in Viennese musical life. The roles of Mozart and Stadler in this process are well known, but it coincided with the emergence of the Viennese clarinet, an instrument which was notably different from clarinets in the rest of Europe. This study is an examination of the features of that new clarinet and the craftsmen who developed it.

The study includes: A survey of the place of the clarinet in Viennese music and prominent Viennese clarinet makers; Comparison of organological data from measurements of 27 clarinets, 15 Viennese to reach firm conclusions about the design characteristics which distinguish Viennese clarinets; A report on the process of adapting four clarinets by A. Grenser, Lotz and Griesbacher to play at A=430; and An analysis of the performance (tone, intonation, etc.) of each instrument.

Ignace De Keyser

Sax and the bass clarinet: new evidence

On June 21, 1838, Adolphe Sax patented a new bass clarinet in Brussels. Its 'réflecteur sonore' became the typical upright bell of his later saxophone. Even before the date of the patent, Adolphe Sax is credited with the production of bass clarinets, when he still was an apprentice in his father's workshop. The nature of this early production is unclear. Based on new evidence, Ignace De Keyser will formulate a new hypothesis on the genesis of Sax' bass clarinet.

Arnold Myers and Sarah Deters Richardson

Collecting Culture: Creating a Museum Collection of Bagpipes

In 2007 the United Kingdom's Heritage Lottery Fund (HLF) invited bids from museums under the 'Collecting Cultures' scheme: this was designed to give substantial support for acquisitions, also to improve curatorial skills, foster research and increase public involvement with museum collections. At this time the Edinburgh University Collection of Historic Musical Instruments had impressive holdings of many types of instrument, but few bagpipes. Given the widespread popular association of bagpipes with Scotland, this represented a missed opportunity in terms of organological communication with the public, and a weak resource for research. The University's bid to the HLF was successful and a five-year project to develop an almost completely new museum collection of bagpipes commenced in 2008.

This paper describes how an emphasis on history and culture have shaped the development of the piping collection, how the University despite the small number of bagpipes coming onto the market has formed a coherent collection which allows a nuanced interpretation of the history of the bagpipe in Britain, and how the museum staff have interacted with a lively culture of bagpipe playing and bagpipe making which invariably attaches much importance to tradition and history.

Renato Meucci, Gabriele Rossi Rognoni, Virginia Villa

The new Museum of the Violin in Cremona

A new Museum of the Violin is going to be opened in Cremona in March 2013. The museum includes the three main Cremonese collections related to violins and violin-making, presently dispersed in different locations: the collection of classic violins of the town hall, the collection of Stradivari's workshop materials, the civic collection of nineteenth and early twentieth-century instruments and the collection of contemporary instruments, winners of the various editions of the Triennale di Liuteria, and finally the collection of the Friends of Stradivari, that includes instruments of the classic Cremonese school on temporary loan from private owners.

The display combines new technologies and traditional display in order to introduce the general public to the history and behaviour of the violin, and to allow specialists to appreciate the instruments fully. The museum was financed by the private sponsor Cav. Giovanni Arvedi and is hosted in a historic building from the 1930s restored for the occasion, that also includes an audition room and a 300-seat auditorium. The paper will briefly present the concept, display and solutions adopted for the museum.

[Organised by] Silke Berdux, Sonja Neumann and Panagiotis Pouloupoulos

Panel session, 'New Media for Musical Instrument Collections: Trend, Luxury or Necessity?'

Introduction

Several important museums housing musical instruments are already in a stage of renewal or have plans to do so in the near future. At the same time, the increasing demand to provide more context and interpretation in museums, especially the inclusion of 'sound', but also the use of multimedia in new musical instrument exhibitions, is becoming a crucial and complex topic among museum curators.

The aim of the proposed session is to provide a 'platform' for the exchange of material and ideas on how museums can present musical instruments and sound through the effective use of new media. The session may also investigate how new media and sound can enhance the visitors' understanding and appreciation of musical instruments, but also how they can amplify their own creativity, imagination and social interaction within a museum. Additionally, the session will attempt to examine

potential ways for the efficient development, practicability and sustainability of media in musical instrument exhibitions.

The session will have the form of a panel discussion with short papers related to the development and use of media in musical instrument exhibitions (10 minutes each) by 8 participants from various museums, followed by a longer discussion between the panel and the audience. The results of the session may be published in the CIMCIM bulletin and website for further evaluation.

Silke Berdux, Sonja Neumann and Panagiotis Pouloupoulos (Musical Instrument Department, Deutsches Museum, Munich)

Developing a New Media Concept for Musical Instruments in the Deutsches Museum

Since 2012 the permanent exhibition of musical instruments at the Deutsches Museum is under major renovation, a process which has involved the design of a new media concept. This session will address some of the main issues in creating new media which can be effectively used to display the ‘sound’ and the important historical and technical aspects of the exhibited instruments, while engaging visitors in the original socio-cultural ‘atmosphere’ which influenced the makers and users of these artefacts. Several examples of currently available ideas for user- (and museum-) friendly multimedia devices, hands-on and interactives will be presented and analysed.

Rudolf Hopfner (Kunsthistorisches Museum, Vienna)

From ‘Hausmusik’ to ‘Audioguide’: Live concerts, ‘hands-on’ and interactive media in Vienna’s Collection of Historic Musical Instruments, 1939 to 2013

Already in 1939 the Viennese Collection of Historic Musical Instruments began to organize concerts on a regular basis. After 30 concerts the series came to an end in January 1945. After the reopening of the collection in the 1960s there were only occasional concerts until we initiated a new series in 2000 with four concerts a year. With the exhibition ‘Die Klangwelt Mozarts’ in 1991 an Audioguide was introduced. Over the last years several ‘hands-on’ devices and interactive media were incorporated in the permanent exhibition.

Monika Lustig (Stiftung Kloster Michaelstein/Musikakademie Sachsen-Anhalt für Bildung und Aufführungspraxis, Blankenburg)

New media in the exhibition ‘KlangZeitRaum’ in the music academy for education and performance practice Michaelstein

In the new exhibition ‘KlangZeitRaum. Dem Geheimnis der Musik auf der Spur’ musical instruments are presented in the context of music and ‘time’. The use of new media was indispensable to illustrate this subject and to make it attractive for the visitors. New media have been used, for example, in a time machine, where visitors can hear and see the change of music and instruments in different times or in the presentation of a whole baroque ensemble in the context of a baroque church, where visitors can experience church music as an impressive light-show and use a multimedia station. Further devices, e. g. the inclusion of sheets of music, pictures in big formats with musicians in performance situations, or figures in real size, serve also the demand to provide more context in museums. Moreover, an audioguide and special devices or games for children are also integrated in the exhibition.

Olaf Kirsch (Museum für Kunst und Gewerbe Hamburg) and Frank Böhme (Hochschule für Musik und Theater Hamburg, Hamburg)

‘Patente Instrumente’/‘Ingenious instruments’: Exhibition and Media-based Education Project

The exhibition ‘Patente Instrumente’/‘Ingenious Instruments’ in the Museum für Kunst und Gewerbe Hamburg presents round about one hundred unusual string and wind instruments from the nineteenth and twentieth century. It recounts how instrument makers as well as engineers, mechanics and scientists attempted to develop and improve musical instruments. For this show an extensive media-based museum education program was developed in collaboration with Prof. Böhme, Dr. Czolbe and students of the Hamburg Hochschule für Musik und Theater: Sound samples and explanations of numerous instruments are presented on more than forty audio tracks; in several video clips, musicians demonstrate how instruments are played; in addition, four short films were produced and two audio features. The material is offered in the exhibition and can also be downloaded as iPhone App.

Darryl Martin (Edinburgh University Collection of Historic Musical Instruments, Edinburgh)

New Media in the Edinburgh University Collection of Historic Musical Instruments

The Edinburgh University Collection of Historic Musical Instruments is in the process of fundraising for a redevelopment project which will see the entire display in a single building. As the adaptation of the existing building leaves no

opportunity of increasing the available floor space, the interpretation for the forthcoming displays will have to take up minimal space, while still providing information aimed at different levels of visitors. This paper will examine various approaches that are currently being trialled as part of the redevelopment project, including sample kiosks (where the visitor can play an electronic keyboard with samples of original harpsichords), sound guides, standard traditional 'apps', and a 3D 'app' which allows the visitor (including the online visitor) to digitally go around - and inside - the entire instrument.

Darcy Kuronen (Museum of Fine Arts, Boston)

Musical Instruments at the MFA: A New E-book

Musical instruments are among the most meaningful artifacts produced by humankind, a marriage of technology, artistry, symbolism, religion, and entertainment. This paper will present a new e-book which brings to life the world-renowned collection of instruments at the Museum of Fine Arts, Boston, enhanced with forty-eight audio and video clips of musicians performing on rare, historical, and exotic instruments. This title presents more than a hundred examples of instruments from the MFA's collection, offering an engaging array of instruments as producers of both aural and visual delight, with embedded audio and video samples to provide an accessible and fascinating introduction to the artistry and diversity of musical instruments from around the world.

Eric de Visscher (Director, Musée de la Musique, Paris)

New Media at the Musée de la Musique

In 1997, the Musée de la Musique in Paris was one of the first music museums to offer a free audio content, with a now-abandoned system of infrared beaming. It was later replaced by an audio guide, with greater capacity, offering different contents to specific audiences (adults, children, handicapped persons), as well as access to audio-visual content. This presentation will summarise the different contents that this audio system allows to listen to, as well as the reactions of the audience and team members'. Additionally, two new developments, the 'Touchez la musique' (for visitors with various types of handicap) and 'AMMICO' (a research project aimed at developing a new interactive device) will be discussed.

POSTER SESSIONS

Quincy Whitney

Lady Stradivari: Carleen Maley Hutchins and the Violin Octet

Stradivari, violins and viols, “The Messiah”, violin mystique and the viola puzzle, consorts and the luthier’s workshop—all lie at the heart of the Carleen Hutchins story. A pioneering female in three male-dominated fields—violinmaking, physics, and classical music—Hutchins beat the odds and contributed more to violinmaking than any other luthier since Stradivari. She laid the groundwork for the modern world of violinmaking by bringing science and openness to an ancient art shrouded in secrecy for centuries.

Trained in biology and the trumpet, Hutchins carved her first viola just to see if she could do it, then taught herself acoustical physics by making violins. Her output includes nearly 500 instruments, 100 technical papers, two benchmark Scientific American articles and the founding of an international society aimed at making a better fiddle. In addition, Hutchins invented the Violin Octet, a new family of violins across the tonal range of a piano that produces sounds never before heard from a consort of strings.

How could one New Jersey housewife carving fiddles in her kitchen impact the violin world? Hutchins asked unpopular questions no one else would ask—about labels and acoustics, old versus new, and the role of players versus dealers in determining violin value. She faced the wrath of her peers--luthiers and dealers condemned her for demystifying the “magic” of the violin. Hutchins broke down barriers and built bridges where there had been walls—between art and science, and between people.

Anneke Scott

Research through recording - a report on the Bate Collection recording project

The Bate Collection has recently embarked on a long term project producing a series of CDs each showcasing the history of an instrument through examples in the collection. Thanks to Reginald Morley-Pegge, Jeremy Montagu, Anthony Baines, Philip Bate and others, the collection is particularly renowned for its collection of horns and it could be seen as a fitting tribute to these figures, who not only donated instruments to the collection but also added to the literature on the subject, that the first disc in the series would feature these instruments. The horns date from early eighteenth century cor de chasse through to early twentieth century rotary valve instruments and the disc has been designed to reflect this breadth, featuring works from Handel through to Richard Strauss. This paper will discuss the process of selecting appropriate instruments and repertoire, curatorial concerns and non-interventionist approaches to making instruments playable for recordings or concerts, issues surrounding representation of these instruments through recordings and the resulting pragmatic decisions taken on the forthcoming disc.