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Catalogue of the Edinburgh University Collection of Historic Musical Instruments

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FELLOWSHIP OF MAKERS AND RESEARCHERS OF HISTORICAL INSTRUMENTS

Honorary Secretary: Jeremy Montagu, 171 Iffley Road, Oxford OX4 1EL, U. K.
FELLOWSHIP of MAKERS and RESEARCHERS of HISTORICAL INSTRUMENTS

Bulletin 84

July, 1996

We've been running from my home at 171 Iffley Road now for nearly a year, despite which one book for review (from one of our own members, too), letters from some of you, and repeated press releases from the British Clavichord Society have been going to our old address (Music Faculty) – please don't do it.

And Barbara tells me that there has been a recent spate of cheques being made out to her, rather than to FoMRHI – please don't do that either. It causes much chaos in her accounts because she has to explain to the tax people that this was not money coming to her, neither personally nor as part of her instrument-making business, but really for FoMRHI. If you're paying for FoMRHI, please make the cheques out to FoMRHI.

EARLY INSTRUMENT EXHIBITION: As you know this is to be held again this year, 6-8 September, at the Royal College of Music, and as I told you in January I shall be in France at an ethnomusicology conference of which I'm president and so have to be there. Barbara has said that FoMRHI can use a corner of her stand, but it would be useful if people could help to run it so that she doesn't get interrupted too often with FoMRHI queries while selling bassoons. Volunteers for days, part days, whatever you can manage, to her, please, will be gratefully received. As usual we shall be happy to take advance renewals, sell you back issues, and so forth.

FURTHER TO: Hide Glue: Professor Sir James Beament tells me that Seccotine liquid glue is still available, in 100 ml pots. Certainly up until two years ago the UK distributors were Primrose Repair Services, Dunstable Road, Dagnall, Berkhamstead, Herts HP4 1RQ; tel: 01442 842394. Whether it’s also available in tubes like it used to be before the war, he didn’t say – in those days it was the main domestic glue, as Evostik and the other plastics are nowadays.

FORMAT FOR COMMS & E-MAIL: In case you haven't noticed, this is on the back of the List of Members – I do get asked about this, hence the reminder. And yes, as I said in the last Bull., we're happy to receive Comms by e-mail (Arnold Myers sent his that way for this Q). Also, of course, any notes for the Bulletin, which are very easily incorporated if they come that way. I'm a little less inclined to send Qs out that way (Eph is also likely to have some views on this in the Bulletin Supplement) partly because of the effort of doing it (scanning in all that hasn't come electronically, correcting what the scanner has misread, and then sending it out which is the least of the job) and partly because while quite a lot of us are now on e-mail, it's still only a fairly small minority. I could easily send out this Bulletin by e-mail and any of my own Comms, and so could Eph of course with his Comms – if anyone wants us to, our e-mail addresses are in the List of Members, in the last Bulletin on the first page, and on the back of the List of Members.

THINGS AVAILABLE: Moony Kara of Northern Crescent (UK) Ltd, who is one of our members, says that they have gathered a stock of various sizes of dimensional pieces of musical quality African blackwood due to cancelled orders and wrong sizing. He doesn't say what sizes nor what prices – he mentions repair and small manufacture, but that could be anything
from fiddle pegs to bass clarinets – but if you’re interested get on to him. He’s in the List of Members.

The British Clavichord Society now has a Professional Register. If you’re involved with clavichords, you should be in it – if you’re not in it, get on to Sheila Barnes, 3 East Castle Road, Edinburgh EH10 5AP and join the BCS. If you want a copy but don’t want to join, they cost £4 in UK, £5 elsewhere in Europe, £6 further afield from Edmund Handy, 9 Shirley Road, Sidcup, Kent DA15 7JW, cheques made out to the Society and only in sterling.

Do you want a business in Paris, with a workshop for restoring stinging instruments, a large shop for selling, a rare stock of ancient stamped instruments, Violins, Cellos and double-basses? If so, and if you have FF2.400.000, get in touch with Mrs Loisel, 20 boucle des Demoiselles, 91100 Villablé, France, who will put you in touch with the vendors.

Rod Naylor, 208 Devizes Road, Hilperton, Trowbridge, Wilts BA14 7QP (t&fx 01225 754497), sells a variety of three-dimensional copying machines such as the Dupli-Carver. He also has a variety of other carving tools and some materials, including black buffalo horn, ebony, small offcuts of old ivory, tortoiseshell (neither of these exportable of course), and shell.

NEW BOOKS: There are several new or forthcoming books which may interest you. De Clavicordio 2, the papers from last year’s Magnano Conference, and David Crombie’s The Piano, a really well illustrated book, have both just arrived – reviews in the next Q. Who would like to review De Clavicordio? Florence Getrau’s Aux origines du musee de la musique should be with us soon – curiously the pre-publication price of FF 650 expired on 30 April, but the book still hasn’t appeared. The same applies to Paul Benedek’s Violin Makers of Hungary, which cost DM 250 up to 30 June but won’t appear till November, when it will cost DM 340. While the blurb says it will be well illustrated with much detail, it looks as though it covers only modern fiddles. I doubt if they’ll bother to send us a review copy! The next two are periodicals but with a difference. Both are on the Web, ie published electronically. Sonances is a bi-monthly classical music magazine, available either in French or English, starting in November though the site will be open from August with previews. If you’re interested you have to write by ordinary post (which seems to me crazy) to CP 8717, Sainte-Foy, Québec, Canada G1V 4N6 – how can you be on the Web without an e-mail address? The other is the Associazione Italiana per la Musica e la Danza Antiche, who already publish a magazine 415, and who have a site exclusively dedicated to early music: http://dbweb.agora.stm.it/market/415. It sounds as though this is freely available, whereas Sonances I think will cost; they say their first issue in November will be free, which suggests that subsequent ones won’t be.

EVENTS: The third International Clavichord Symposium will take place in Magnano September 24-28 1997, concentrating on Haydn and his contemporaries. This year there’ll be a seminar for builders and performers conducted by Christopher Hogwood and Derek Adlam, September 25-29. If you’re interested in either (or both), get in touch with Susan Brauchli, via Roma 48, I-3050 Magnano (BI), Italy (t&fx +39-15.67.92.60).
The British Clavichord Society is also active, with a Weekend in Edinburgh (30 Aug-1 Sept) at the Russell Collection and a Haydn day next year, April 5, at Pembroke College, Cambridge. Addresses for more information above, towards the top of the previous page.

The American Musical Instrument Society is calling for papers for its meeting in Washington DC, May-15-18 next year. The overall theme is ‘Musical Instrument Studies: Perspectives from a Quarter-Century of the AMIS’ but more or less any subject to do with instruments, all cultures, all periods, will be welcome. Proposals for papers to Cynthia Hoover, NMAH 4127, MRC 616, Smithsonian Institution, Washington, DC 20560, before October 1.

There is to be a Cremona Mondomusica international exhibition of musical instruments and accessories 4-6 October, but as the deadline for spaces is long gone (I can’t think why these people don’t give more notice – it’s like a couple of the books above, why not tell us before the deadline rather than after?) I won’t bother you with more information. If you want to visit it, you have the dates, and it sounds as though you won’t be able to miss it once in Cremona.

The ninth Suffolk Village Festival, directed by Peter Holman, takes place 23-26 August on the Suffolk Essex border. There is an instrument maker’s exhibition. More information from Mrs J Pearson, 50 Halstead Road, Lexden, Colchester C03 5AF (01206-767895).

ENVOI: For once I’ve done this last, so there’s no need to hold it open.

DEADLINE FOR NEXT Q: October 1st, please. Have a good summer, and think up some good Comms for October. You can either send them or give them to Barbara at the RCM and she’ll pass them on to me, or give them to Eph if he’s there (I’ve not asked his intentions).

Jeremy Montagu
Hon.Sec.FoMRHI

BULLETIN SUPPLEMENT

Ephraim Segerman

Musicians vs. scientists

It is understandable for musicians to perceive an ‘us and them’ fence between themselves and those that they feel disagree with their judgments. It is also understandable for Alec Loretto to make clear what side of that fence he is on by his Comm.1434 endorsing Chiverton’s ‘fun’ in Comm. 1411. He shows a very good understanding of the psychology of performers in Comm. 1431, where he also gives an excellent scientific account of the origins of differences in sound between the use of different materials in making recorders. He is obviously a scientist masquerading as an anti-scientist. I suggest that when we discuss him with musicians, we should be careful not to blow his cover.

Chiverton’s Ockham

In the above-mentioned Comm. 1411, Roy Chiverton wrote more nonsense than he quotes. I never would have thought that he could be so parochial. He would find it hard to defend his
implications that philosophy is irrelevant to scholarship or instruments, or that ‘the principle of least complexity’ is ‘meaningfully different’ from ‘you should not increase beyond what is needful the things you think of as existing’. The latter is a fine statement of the Razor, and I suspect Roy still doesn’t appreciate that ‘what is needful’ can mean ‘everything that is needed’, or that ‘the things you think of as existing’ can mean ‘the components of your model for truth’. The further implication that I have misled the FoMRHI readership on Occam’s Razor is nasty as well as untrue. Great principles are great because they can be applied to situations way beyond those envisioned by their originators. I’ll spell all this out if anyone is interested.

Praetorius’s recorder pitch

Those readers who believe that the lengths of Praetorius’s recorders support, or at least do not contradict, the hypothesis that the pitch standard that the recorders conformed to was $a' = 460$ Hz are in for a shock in next year’s Galpin Society Journal. There will appear an article of mine which does a statistical analysis comparing all of the recorders Praetorius depicted with a number of surviving Renaissance recorders of which measurements and blowing pitches have been published. That hypothesis just ain’t so.

A few decades ago $a' = 460$ Hz was called ‘Bob Marvin Pitch’. Bob was making the best Renaissance recorders around after doing his measuring tour, and it was considered a privilege to get one of them. That was the most common pitch standard he found, probably a Venetian one. While every other wind instrument maker has felt obliged to scale their instruments to the pitch standard the customer wants, Bob was more committed to historical accuracy, and followed authentic pitch as well.

The Renaissance wind people needed a pitch standard different from $a' = 440$ Hz to impress audiences with how authentic they were, so they adopted Bob’s, which had a glow of authenticity about it. That would be fine historically for Renaissance wind bands, but they insisted that this also was the standard of Praetorius, thus justifying using it for all kinds of mixed ensembles. The above study, ironically mostly using Bob’s measurements, shows that this has never been any more than wishful thinking.

On Comm 1439 claiming wood changes on playing in

This letter to the Editor of Nature was probably refereed by a busy academic who dabbles in the technology of wood for musical instruments (e.g. see Comms. 1337 and 1363). That referee didn’t notice that the experimental measurements reported in the paper could be fully explained without recourse to the extraordinary properties of wood that the authors claim to have observed. My reply challenging that paper is included in this Q. I faxed a copy to Hunt (the senior author) in mid June, offering to discuss it with him before publishing. I have had no reply. I’ve told it all to my e-mail friends in the world of violin technology, who have encouraged me to publish it in Nature. I decided to publish it here instead because all it would do there is blot his reputation, while the people who are really concerned about the issue could more readily find out through e-mail and reading it here.

An Instrumentarium for each region and period

While reviewing Jeremy’s book on instruments in the Bible, I wondered about whether there were any instruments known about from the eastern Mediterranean or Near East during that period that had not been considered as possibilities. Then I remembered that Howard M. Brown was once considering whether some sources were attempting to be comprehensive, presenting an Instrumentarium of all known musical instruments played there then. He also thought that it would be an excellent step forward in the history of musical instruments if someone or a group of organologists compiled an Instrumentarium for each region and period of music history. Does anyone know whether he ever did anything about this idea? There would be many problems, such as defining each region and period. Some would be easier than others, but any work done along these lines would be very useful. Can we discuss this further?
EDINBURGH UNIVERSITY COLLECTION
OF HISTORIC MUSICAL INSTRUMENTS

CATALOGUE

The Edinburgh University Collection of Historic Musical Instruments has grown from small beginnings around 1855 to become a collection of international importance with some 2000 instruments and related items. The Collection includes musical instruments of all kinds except harpsichords and clavichords; the University’s Russell Collection, with its own catalogue, specialises in early keyboard instruments.

The new catalogue, Historic Musical Instruments in the Edinburgh University Collection, is replacing the series of Check Lists published in the early 1980s. The catalogue consists of a single illustrated volume, fascicles of text describing the instruments in detail (available in both printed and electronic versions), supplemented by further illustrations available through the World Wide Web.

Until all the fascicles have been produced, the most complete account of the Collection available is the Illustrated Volume with the series of fascicles as it stands, plus whichever of the Check Lists are needed to complete the coverage. Each Check List will be allowed to go out of print once superseded by the corresponding catalogue fascicle(s).

VOLUME 1: THE ILLUSTRATIONS
Edited by Arnold Myers

This bound volume, published in August 1990, contains a concise history of the Collection, an account of the Methods of Cataloguing and nearly 400 full view photographs, close-up photographs and radiographs of instruments and related items. ISBN 0 907635 17 2

Price: £25.00. Packing and postage extra:
£3.00 to addresses in the United Kingdom.
£5.00 overseas surface postage.

VOLUME 2: DESCRIPTIVE FASCICLES


Price: £3.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom.
£2.00 overseas surface postage.


Price: £3.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom.
£2.00 overseas surface postage.

Part B Fascicle ii: Lutes, Citterns and Guitars. Published October 1992. 44 pages. ISBN 0 907635 20 2

Price: £3.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom.
£2.00 overseas surface postage.

Part C Fascicle i: Viols and Violins. Published February 1995. 64 pages. ISBN 0 907635 26 1

Price: £4.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom.
£2.00 overseas surface postage.

Part D Fascicle ii: Transverse Flutes. Published August 1992. 100 pages. ISBN 0 907635 18 0

Price: £5.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom.
£2.00 overseas surface postage.


Price: £4.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom.
£2.00 overseas surface postage.

Part E Fascicle ii: Bassoons. Published May 1993. 29 pages. ISBN 0 907635 21 0

Price: £3.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom.
£2.00 overseas surface postage.


Price: £5.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom.
£2.00 overseas surface postage.

Part H Fascicle i: Horns and Bugles. Published September 1992. 70 pages. ISBN 0 907635 19 9

Price: £4.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom.
£2.00 overseas surface postage.


Price: £5.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom.
£2.00 overseas surface postage.
Price: £14.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom,
£2.00 overseas surface postage.

Price: £5.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom,
£2.00 overseas surface postage.

Part H Fascicle v: Large Mouthpieces for Brass Instruments. Published January 1996, 35 pages. ISBN 0 907635 31 8
Price: £4.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom,
£2.00 overseas surface postage.

Price: £4.00. Packing and postage extra:
£1.00 to addresses in the United Kingdom,
£2.00 overseas surface postage.

The data in the ASCII versions are given with systematically tagged field names or abbreviations to allow users to enter all or part of the data into their own databases.

VOLUME 3 THE ELECTRONIC PICTURE GALLERY
Images of some instruments not illustrated in Volume 1.

CHECK LISTS

Ethnic Musical Instruments ISBN 0 907635 00 8
Brass Musical Instruments ISBN 0 907635 01 6
Double-reed Musical Instruments (including oboes and bassoons) ISBN 0 907635 02 4
Plucked and Hammered Stringed Instruments ISBN 0 907635 03 2
Flutes and Whistles ISBN 0 907635 04 0
Bowed String Musical Instruments ISBN 0 907635 05 9
Single-reed Woodwind Instruments (including clarinets and saxophones) ISBN 0 907635 06 7
Percussion Instruments ISBN 0 907635 07 5
Free Reed, Miscellaneous and Ancillary Instruments ISBN 0 907635 08 3
Bagpipes ISBN 0 907635 09 1
Price: each £1.00 including postage to addresses in the United Kingdom (except bagpipes list),

£1.50 including overseas surface postage (except bagpipes list);

£2.00 including postage to addresses in the United Kingdom (bagpipes list),

£2.50 including overseas surface postage (bagpipes list).

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Thus an order for one copy of the Catalogue Volume 1 (The Illustrations) plus all fourteen fascicles of Volume 2 posted to an address in the United Kingdom reaches a total value of £297.00 and qualifies for a discount of £32.67; an order for one copy of the Catalogue Volume 1 (The Illustrations) plus all fourteen fascicles of Volume 2 plus all ten Check Lists including overseas surface postage reaches a total value of £1130.00 and qualifies for a discount of £43.33.

Orders must be accompanied by remittance. Please remit by cheque payable to the University of Edinburgh, made out in pounds sterling, either drawn on a U.K. bank or a Eurocheque. A form for VISA or MASTERCARD payment can be requested.

Despatch orders and remittance to: The Curator, Edinburgh University Collection of Historic Musical Instruments, Reid Concert Hall, Bristo Square, Edinburgh EH8 9AG, Scotland.

23rd January 1996
FoMRHI Comm. 14 7

Jeremy Montagu


Prices are presumably broadly in line with those reviewed (Comm.1406, January, Q.82).

The division between the first two comes with trombones – both alto and tenor trombones count as 'Large', whereas tenor horns, trumpets (and soprano trombones) count as 'Small'. I suspect that the reason for division is that there is a limit to the capacity of stapling machines (all these fascicles are saddle-stitched) and so there had to be a division somewhere, and this point is more logical than most. Other than that, there is very little to say about these two fascicles. All the brass mouthpieces in the Collection are listed; all have numerous measurements and good descriptions.

I think that there is a fundamental error involved, and that is the separation of mouthpiece from instrument. I am well aware, being a brass player myself, that few mouthpieces were supplied with the instrument that they are now associated with – if one buys a new orchestral instrument which comes with a mouthpiece (often a sign that the instrument is of student quality), the first thing one does is throw away the mouthpiece and either buy a decent one or use the mouthpiece that one normally uses. But when a mouthpiece comes to a museum with an instrument, that mouthpiece is a part of that instrument for ever (well, no, not often – in too many museums they get separated, but not, I suspect, when Arnold Myers is looking after them). Therefore it should have the same catalogue number as that instrument (with the addition of whatever diacritical letter or sign that one wishes). After all, horn crooks are catalogued with the instruments – why not the mouthpieces? Bassoon crooks are catalogued with their bassoons and so are clarinet mouthpieces in other fascicles, and they are separated from their instruments just as easily and nearly as often. The separation of brass mouthpieces seems to me just as illogical as the separation of bows (which I commented on also in a previous review of these fascicles). The fact that they arrived together with the instruments makes them, so far as the museum is concerned, an inherent part of the respective instrument. Then the casual mouthpieces (and bows), of which we all have a fair number, are distinct from those associated with instruments and can be catalogued separately.

The third fascicle, that for Ancillary Equipment (which is where unassociated mouthpieces and bows could go) is a fascinating fascicle. It includes conductors' batons, including Donald Tovey's and C J Niecks's, many pitch pipes, tuning forks, music stands, action models, and so on. The pitch pipes are both flue and reed, and all are carefully measured with all variations from equal temperament carefully noted. I did this myself once in a Bate Catalogue and enjoyed myself hugely listing all the errors in these devices intended to help us tune our instruments!

An interesting section is that for the scientific acoustical apparatus and other teaching material, including many varieties of organ pipe and an uncoiled french horn. Unfortunately much of the scientific apparatus is missing, some of it located in other museums or departments of the University, but there is a complete list given, including all that purchased by Professor Donaldson and catalogued in 1852. A final Appendix lists all the instruments and other apparatus purchased for the Music Classroom between 1855 and 1861, in itself an interesting record of what was used at that period.

There is also a very interesting introduction describing the battles that Professor Donaldson went through to acquire anything at all and to do any teaching.
Review of: Larigot 17 (August 1995) & 18 (February 1996), ACIMV, chez B. Kampmann, 93 rue de la Chapelle, Apt. 166F, F-75018 Paris. FF 150 per annum (3 issues), back numbers FF 40 each, 100 for 3, 400 for all 17.

The first of these is the issue which I said in January (Comm. 1405) I thought I'd missed reviewing - I hope it's the only one. It starts with a note on an interesting and unusual compensating system by Boosey & Co. Then comes a list of all the 'brass' instruments in the Barcelona Museum, which might have been useful for all those who do not have the catalogue were it not misleading because it is incomplete and includes only the European art music instruments. None of the non-European instruments are included, nor are any of the European folk instruments, but there is no warning of this. All that Beryl Kenyon provides as a title is: Barcelona Museu de la Música (les "cuivres"). The quotes, which imply that all non-metallic trumpet type instruments were included, is only there for the serpents etc. Even the cornets are omitted. This is followed by a short note on the Thibouville permutations with a list of the large number of firms which included one or more of the family. Here there are two omissions, the three letters JTL which appear on some instruments without the full name of Jérôme Thibouville-Lamy, and also the trade name JeTeL which appears sometimes without any other mark, either like that or as JETEL - I have a musical saw marked The JeTeL. As usual there is a reproduction of a trade list, this time of the firm David, Paris, 1883. They seem to have been both Sax pirates and Sax licensees at various dates. Interestingly for a French firm, a number of the brass have rotary valves, and there was obviously a German connexion.

Finally, there is a useful list of the prices reached at the auction in Vichy in May, 1995.

Larigot 18 starts with three short articles, the first the observations of Antonio Romero after his visit to the International Exhibition in London in 1862, the second on the flageolet (rather curiously ignoring the basic distinction between the French and English systems, that the English has six fingerholes whereas the French, the only one described even though the English is illustrated, has four fingerholes and two thumbholes). The third is on a 16-bell, 16-reed metal 'trumpet' - we have no real term for these elaborations of the station-master's 'horn'; this one is called Doppeloktavtrompette. This article has good diagrams to show how the tubes link with each other.

These are followed by reproductions of French nineteenth-century musical pornography, with scantily-clad or even unclad ladies playing a variety of instruments. Then again a list of auction prices realised at Vichy in December last. Finally another short article on the Pénet trompe de chasse.

Two useful issues with, as always, a variety of cartoons, often reproductions of nineteenth century caricatures, various items of notes and news like our own Bulletin, and a back page of advertisements of instruments sought, for sale, exchange, and so forth.

The Danish church wall paintings are rather less useful than the illustrations in medieval manuscripts, paintings, and church carvings only because they are rather more sketchy. This is perhaps not surprising if one considers the comparative comfort and convenience of painting in a scriptorium or a studio in contrast with up a ladder or on a rickety scaffolding. And while church carvings are frequently at even dizzier heights, one assumes that they were seldom executed *in situ* but were normally carved at ground level and installed in the roof, or wherever, when finished. Thus one would not use this book as a model for reproductions, nor even as a source for any very detailed typology, as one might with, for example, the carvings of Beverley Minster (*Early Music*, July 1978), the great Memlinc triptych in Antwerp (my *World of Medieval & Renaissance Musical Instruments*, pl VIII & IX), the windows of the Beauchamp Chapel (*ibidem*, pl.45, 47, 55 & 58) and many other sources which many of us have published at one time or another.

However, one can of course recognise most instrument types (a few paintings are sufficiently damaged or sketchy that one cannot say much more than "probably a trumpet") and thus what the book is useful for is to compare dates and distribution of types with those in other areas. For example, the incidence of the lute seems slightly higher in the 14th and early 15th century than in England: see my and Gwen's *Minstrels & Angels - Carvings of Musicians in Medieval English Churches*, forthcoming, in which I have commented on the comparative rarity of the lute. On the other hand, we have found far more citoles and gitterns, especially the latter, than there seem to be in Danish Churches (the so-called lute or mandora on p.54 is certainly a gittern - the smaller body and the sickle peg-box are quite clear).

The subject matter of such wall paintings is rather more serious than many carvings which, rather like the illuminations in Books of Hours, are frequently designed for entertainment as much as for edification. The wall paintings are there to remind the congregation of the events of the Bible and allied legends and, in particular, to remind them of what's going to happen if they do not mend their ways. Hence the large number of Doom paintings with the Blessed on one side and the Damned on the other, incidentally, on the reverse sides from those stated on p.30 - one should always see them from the Judge's left or right, not from ours, so that the Blessed are always on the right and the Damned on the left (what's the equivalent of sexism, ageism, etc, for left- and right-handers?), just as the good characters in a pantomime always appear from stage right and the evil from stage left - memories of the old church plays.

Also well worth reading is the author's excellent expositions of symbolism, an aspect of church iconography that I and others have sometimes neglected too much.

The illustrations are well reproduced, the vast majority of them in colour - I've not counted but there must be a couple of hundred or so.

In sum, this is an excellent study in medieval iconography and essential for anyone working at all seriously in that subject.

This is one of the most entertaining books there is on the history of brass instruments, full of good stories as well as a surprising amount of useful information, surprising because it is so gossipy. It began life as a series of lectures given to the members of John Broadwood’s Band, and was expanded into a book with the addition of two new chapters and The Brass Bandsman’s Directory and an index. The introduction on the elements of music can, and should, be taken with the occasional pinch of salt, for much has been learned about the early history of music and instruments, and of acoustics, since 1895, but many of Rose’s remarks on non-European instruments are accurate and interesting. He was a well-travelled man and gave several papers on such instruments at meetings of the Musical Association (unfortunately omitted from the bibliography of this edition) and quite often chipped in with interesting and relevant remarks in the discussions after other people’s papers at those meetings. The fact that the RMA today is uninterested in musical instruments is liable to make us neglect its earlier days, where a number of important papers may be found. The RMA published in 1948 a useful index of all papers read between 1874 and 1944.

Rose is less accurate in his many, and in those days still obligatory, references to biblical instruments, for he bases them all on the English translation, forgetting, like so many others, that it is a translation and, for that matter, that even the original text cannot, for example, be trusted to distinguish between brass and bronze (copper-zinc and copper-tin alloys). Of his own day, however, Rose is full of useful technical information on how instruments and their materials are made. He also names and describes many instrument-making firms, fleshing out with anecdotes the basic information that Langwill took from this book for his invaluable Index. There are also many photographs of people making instruments in the workshops of these firms. There are, too, many anecdotes about the professional musicians of his day, many of them interesting, and many of them funny as of the unnamed German horn player who, finding his tone rather dull, extracted first a handkerchief, then a pair of slippers, and last a large garlic sausage from the depths.

Much of the information is significant, for example that Boosey’s claimed to have been the first to introduce tubing drawn from the solid, that Rudall Carte and Potter still hammered their brass bells, rather than spinning them and that Potter’s avoided the V-shaped gusset as inimical to good tone. These are only four of the innumerable examples that I could cite. This is one of the most valuable source books we have, and one that is often neglected, partly because of its rarity (I have found in the past a surprising number of people who have never heard of it) but chiefly, I suspect, because its entertainment value is so high, which makes the more solemn researchers among us discount it.

This is a book which for many years I tried in vain to obtain. At last I managed to find a very delapidated copy, and this makes me all the more grateful to Tony Bingham for providing new copies for us all.
FoMRHI Comm. 145

Jeremy Montagu


Doubtless I should have said how many pages the book has, but since each chapter is paginated independently, there's no indication and if they can't tell us, I'm too lazy to add them up!

The A-4 (approx) booklet is curious both for what it includes and for what it does not include. There is a number of musical examples, all renaissance, none medieval, London Pro Musica prints. This despite the fact that LPM do publish some of the mediaeval dances to which we always did add percussion in performances with Musica Reservata (and to which most other ensembles have also added percussion). Some of Miss Monroe's added percussion here is OK, though most is pretty inept, particularly in Gervaise's *Pavane de la Guerre*. This is a work late enough that one could use timpani, as we did at least once, but if one were to use side drum, as suggested here, it might bear a rather closer relationship to the music and the period.

Obviously one has no objection to using LPM prints as musical examples — as we all know, they are good, clean, well-edited versions. What is surprising, though, is that she does not also use any of the surviving examples from the period. Thoinot Arbeau provides excellent examples of what one should play, but although she refers to his book somewhat elliptically by giving its date but not its title (she says 'the earliest written drum music we have is from 1589' — she follows many people by citing only the second edition) she does not reproduce any of his examples. The probable reason, judging from her own examples, is that she wants something more 'interesting' than the steady rhythms he provides in notation and the importance of which he stresses in his text. She does at least list him in her bibliography, though only the rather inaccurately translated Dover edition and not the facsimile of the third edition of *Orchésographie* of 1596 which was published by Minkoff in 1972.

There are many small illustrations of people playing instruments. None of them is dated, none is captioned, many of them are irrelevant — it is hardly germane to the subject to have an illustration of a Sumerian or Babylonian relief, nor a nineteenth-century pseudo-Roman illustration, nor, though this is rather nearer, something from Bonanni in the eighteenth century. Nowhere is there any warning that these are neither mediaeval nor renaissance, something which is distinctly unhelpful to a readership which cannot be expected to be experienced art historians.

Some of her textual references are equally unhelpful. She says, for example, that 'wooden and bone clappers are pictured during the Middle Ages'. True enough. What she does not say is that these are not in musical contexts. She also points out that ratchets were used as substitutes for bells in Holy Week and in one Jewish tradition, without giving any dates for these practices and without any suggestion for the usefulness of these noise makers in musical performance. She does say that 'bells were very prominent instruments of the medieval period' without warning of any of the inherent problems in their use which have vexed musicologists and instrument historians. She adds that 'During the Renaissance...there are...some representations of bells being played to accompany a tabor pipe.' Really? Where? When?

Her descriptions of instruments are not overly accurate, especially in details of construction. It's quite true that on early drums 'the skin...was kept taut with cords laced
through holes punched in the skin's edge' but she omits the fact that the skin was wrapped in some way round a flesh hoop (not necessarily stitched round a rope ring as I suggested and used in my Making Early Percussion Instruments). One of the most surprising omissions from her references are in fact the two OUP Early Music Series books, James Blades's and my Early Percussion Instruments and my Making Early Percussion Instruments. Whether one agrees with what we've said in those books or not, there is a good deal of information there which isn't available anywhere else.

Most of her advice for performance is good, though she does say that 'the percussionist and the player of the top line should lead together', which is not over-helpful in a period where the tenor is often more important than the top line, particularly for the rhythm. She also says 'you can't really hear what the balance is if you are playing' the remedy for which, which most of us were taught in our school days, is to listen and if you can't hear what you are accompanying, you're too loud.

There's plenty of good advice for care of the instruments, too, though foam is not always suitable as a protection unless it is of conservation quality. One needs to replace it at the first sign of degradation.

A fair amount of her bibliography is irrelevant. Altenburg on trumpets and timps in 1795 is really too late to be useful; there's nothing very helpful in Percival Price's book on bells, and I cannot see how a Revolutionary War Drill Manual of 1794 nor a History of Military Music in America can be relevant to music of the Middle Ages and Renaissance. I was also a little surprised not to see any of Musica Reservata's recordings in the discography.

Ah, right at the end we find sources given for the illustrations, but still no proper captions – the most frequent source is the Dover Music: A Pictorial Archive with no attempt at saying where they got it from, what its original date was, nor even whether it was original or a later redrawing or guesswork. Perhaps I should say here that I was not involved in choosing any of the illustrations for Blades's and my book, and there are several which should not have been there, again a Roman carving (but at least we do say that it was Roman), and a couple of Baker's reconstructions in Beverley Minster, rather than the original fourteenth-century carvings, and one very bad misdating, the early timpani from the Spiezer Chronik which are fifteenth, not thirteenth century. But at least every one is properly captioned below or alongside the picture, with date and source fully given, including the folio number for manuscripts. I suppose that the American Recorder Society were reluctant to pay the necessary fees to reproduce original material.

All in all, the book is a useful introduction to the subject, but by no means as good or as useful as it could have been. Although it's not likely that any of its potential readers are going to be greatly interested in authenticity, it is a pity that they might not have been more helped in that direction.
Although I put 'nd' above, there is a deposition date of 1988 at the back - I am not sure whether this excellent book has been around as long as that, but Florence Gétrau gave me a copy to review here when I was in Paris recently because it is still available. It was published to celebrate the bicentenary of the Musée Instrumentale du Conservatoire National Supérieur de Musique de Paris, and the initiation of the project for the new Museum, of which I have written elsewhere in this Q. It is dedicated, very rightly in those circumstances, to Geneviève Thibault, Mme la Comtesse de Chambure who many of us will remember as the great curator of that museum, and to Georges Henri Rivière. It consists of a series of essays, some of which will become highly important reference sources for the study of Parisian instruments and musical life.

It begins with three introductory articles, on 'Music as an incarnation of a society' (all are in French, of course), 'Musical instruments as works of art', and 'Parisian players and makers' (my translations of course are nothing like as elegant as the originals). The arrangement of the book takes some getting used to. The continuous text is mainly on the right-hand page, sometimes on both; the left-hand page, however, often carries, quite independently, catalogue entries for instruments, many but not all of which are illustrated, and for pictures, and also for other material such as bibliographies, inventories such as those for Jean Desmoulins and Jacques Dumesnil after their deaths, table of measurements of many Voboam guitars, and so forth. It's an odd way to do things but one gets used to it after a while.

The first article proper, by Catherine Massip, is on 'Parisian makers and dancing masters in the 17th century' and discusses their workshops, training, etc, and describes some of the documentary material such as wills, inventories, marriage contracts, and so forth, but comparatively little on the instruments themselves, though two by Dumesnil, a pochette and a guitar, are illustrated and described. This is much more the concern of the next article, by Joël Dugot, on the 'Making of string instruments in the period of Jacques Dumesnil and Jean Desmoulins'. This is principally on lutes of all sizes (Desmoulins's posthumous inventory included 14 theorbos and 249 lutes, which seems an incredible number to hold in stock), angelicas, mandores, guitars and so on. The following article, by Florence Gétrau, is in the same vein: 'René, Alexandre, and Jean Voboam, the makers of the "Guitarre Royale"', with facsimiles of their labels, technical measurements of 26 of their instruments, details of typical decoration and of barring, an x-ray of one instrument and much detail of the makers, their instruments and their milieu. The same author follows this with an article on 'The apogee of the bass viol in France' with details and illustrations of instruments by Nicolas Bertrand and others. Sylvette Milliot writes on 'Parisian violinists and luthiers in the 18th century', listing, illustrating, and describing the most important musicians and their works, and giving a useful table of the most important makers, showing the links between them, both those of family and of professional succession. Julian Clark's article is 'The evolution of the bow at the end of the 18th century', though starting with a quick glance at the bows of the 17th and early 18th centuries and, of course, restricted to French material. There are further articles on the hurdy-gurdy in Louis XV's time, on the pardessus in the
18th century, on harp making (always in Paris, of course) at the end of the 18th century, on guitar mania, including many of the variants such as lyre-guitars, on 19th century luthiers (again by Sylvette Miliot, and again with useful tables of linkages), including Savart and Vuillaume, on 19th century bow-making, on the Franco-Belgian violin school and its influence on European playing, again with a useful table of linkages – I had not realised how practically everybody one has heard of in this century, other than most of the Russians, descends from Viotti by one of four lineages. The final article is on ‘Aspects of 19th century chamber music, the instrument and the musician’.

It is obvious from the above that much of this, fascinating to me as it is, is outside my own area of speciality. I suggest therefore that any of you who already have this book might like to chip in with more detailed comments than I can produce. Meanwhile, I will send this copy up to Eph, who I am sure will want to comment on it, and anybody else who wants to tackle it can get in touch with him and it can be passed round. Since it is fairly heavy, and therefore postage will be exorbitant (between £5 and £6), the ideal would be to go and collect it from him or perhaps to make a contribution towards the cost of it being sent to you.

Meanwhile I would say that it is an essential text for anyone involved with French string instruments – for once the term luthiers is used fairly strictly, though I don’t know what general term one would use to include wind and keyboard makers. It does, of course, give a rather lopsided view of Parisian instrument makers, when one thinks of all those great harpsichord makers who aren’t there, and the wind people, even if most of the woodwind were out of town at La Couture. I suppose I’m biased, being a wind player, but I’d have thought that of the three, the strings were the least important. But then that is the value of this book, for I think that there is more already available about the keyboards and the wind than there is on the strings.

FoMRHI Comm. 1453

Ephraim Segerman

REVIEW of: Jeremy Montagu, Musical Instruments of the Bible, (1996), available from The Montagu Collection of Musical Instruments, 171 Iffley Road, Oxford OX4 1EL, 23pp, £3 ($5)

From the context, about a couple of dozen words in the Old Testament can be interpreted as names of individual musical instruments or of categories of instruments. Sometimes the context implies some characteristic that may be helpful, but identifying any one necessarily involves a considerable amount of guesswork.

We would be quite happy if we could, with some historical authority, have a picture to somehow associate with each name. Illustration was not fashionable amongst Jews at that time, so we might hope be able to approach this by looking at translations of the original words into other languages, where we may have a better chance. Unfortunately, the original meanings of the words were usually forgotten by the time any translation was made, and instrument names familiar to the translators were usually substituted. Linguistic relationships between the names and words in other contemporary languages have often given us clues.

In this booklet Jeremy guides us masterfully through the names, the evidence, the history of guesses and substitutions, and the guesses that he considers are the most likely. The illustrations are 9 photographs of instruments in Jeremy’s collection. The quality of reproduction is commensurate with the price, but adequate for the purpose of showing instrument types.

This is the perfect book on the subject for me. It gives a very clear comprehensive survey of the field for someone who wants to know about it without being burdened by the fine detail that only specialists would be concerned with (sources for that information are given). It is a must for any library on the history of instruments.
I must thank Raymond White for his kind words. When there is response to my Comms in print, it usually is disagreement. Those that do not overtly disagree either disagree privately, are just not interested, or are stimulated to think about the given subject in a way that they hadn't before. It is for this last group that I write.

Raymond mentioned the Volta as 'an interesting contradiction to an obvious rule'. It is not a contradiction of any rule. My deduction of the tempo as crotchet = MM 120 works very well (yes, my first paper outlining the evidence on tempo history came out in the May issue of Early Music). In the volta or the galliard, there is no need for anyone to stay up in the air for a specified time, and a lively dance with a lot of movement should still preserve the dignity of the dancers. When I’ve seen dancers doing the volta at a much faster speed, it becomes either a mad scramble or a showpiece for fast precision dancing, not a proper social dance.

The musical Gestalt is a much easier subject for a poet to address than an analyst. To an analyst like myself, the only reason why a totality is so much more than what we know about its individual components is that we don’t know enough about the components and especially how they interact with one another. If we knew all about all of the components and all about how they interacted with each other, we would know the totality without missing anything. With human emotions we know very little about either the components or their interactions, so there is very little for an analyst to sink his objective teeth into. The totality is very important, and so is worth studying and mapping out, but there is little there to understand rationally with any confidence.

Listening to music with our full attention (and no other conscious activity) is the yardstick by which we evaluate music today. But music has for a very long time been used more as a background, providing 'atmosphere', when conscious attention is mostly directed elsewhere. This includes religious meditation as well as dancing and eating. And there was an enormous body of music written purely for the enjoyment of the performers playing or singing it. The characteristics of the music for optimum intended effect can be quite different when written for these different purposes, and it is quite unhistorical as well as self-centred to ascribe innate value to music using only our own yardstick of CD listenability.

So as for Mozart and Haydn quartets, which were composed for the players to enjoy (not for listeners to enjoy) I am not sure which are better, not having played in them myself. And as an historian, I am much more interested in what players of the late 18th century enjoyed playing, with their technique and interpretations, than how much modern players enjoy them, with our technique and interpretations. There are many music critics who discuss comparative quality of music by past composers. This contributes to modern culture but not at all to music history. All they are doing is trying to refine modern fashions of thinking about earlier music. Fashions are very important in every culture, but my research interest happens to be in past cultures, not modern culture.

As animals in a dangerous world, our nervous system is wired to respond very quickly to sounds before being conscious of them. Hearing is the first sense that develops in the growing embryo, and the sounds heard there are comforting when insecure after birth, as well as the basis of our response to rhythm. When secure, the infant delights in exploring the unexpected. As mammals responsible for infant care, we are wired to respond to their cries, given the reward of endorphin (a morphine-like natural narcotic) for doing so. We also get that 'high' as relief after stress (as exploited in all of the Arts). These are some of the factors involved in our emotional responses to music, but it will be a very long time before we really understand it.

Some may worry that when that happens, the loss of mystery will deaden the enjoyment. I don't. The objective understanding will be much too complicated for most to understand, and for those that do, too boring to think about when enjoying listening to music.
I just noticed that in Playford’s *An Introduction to the Skill of Musick* (7th Edition, 1674), the section entitled ‘A Brief Discourse of the Italian manner of Singing’ (translated from Caccini *Nuove Musicke*, 1602) has descending tirades labelled as ‘falls’ in the ‘Example of the most usual Graces’. A tied sequence of scalewise descending notes taking the time of a crotchet (four semiquavers) is labelled ‘1 A plain fall’. Following this is a sequence of scalewise descending notes taking the time of a minim (five semiquavers and a dotted quaver), labelled ‘2 Double fall’. Here the second semiquaver is actually written as a quaver, which probably indicates that it should be held a bit longer than the others (the first one functioning as an appoggiatura to it), with the following notes rushed, holding the final note to fill the time. According to the text, the second Grace of a pair ‘hath more grace in it than the first’.

The label ‘A fall to take breath’ applies to a quaver rest followed by a tied sequence of six scalewise descending semiquavers. Following it is the label ‘Another fall like it’ applied to a similar sequence of a quaver rest followed by a six scalewise descending tied notes taking the same time, but these notes are written as two quavers, three semiquavers and a dotted quaver. This notation probably indicates that the first two notes were slower and the following four were rushed, holding the final note to fill the time.

In the presentations of the above Graces, they are preceded by a dotted minim in the case of the plain fall and a minim in the others, and they are all followed by a cadence made up of a crotchet leading note, minim final note with a trill (trillo) sign above it, another crotchet leading note and a semibreve final note. In modern phrasing, it is likely that the Grace would be seen as part of the cadence, looking forward, building up to the final note. But we can see in the second versions of each Grace (with more grace), that there is focus at the beginning of the Grace, and then it dies away, providing a low point for the cadence to build from.

That reminds me that in his article ‘Phrasing in contention’ in the latest *Early Music*, Antony Pay makes a similar point about the difference between modern phrasing and classical phrasing: modern phrasing mostly points to cadences that the music is going to, while classical phrasing is mostly beginning-orientated, where the beginnings of phrases have the greatest energy, after which they lighten and give way to subsequent phrases.

I have not seen the above meaning of the term ‘fall’ (i.e. a slurred descending tirade) in any other 17th century English source. To the English, it could well have been primarily a vocal Grace with Italianate associations. As such it is an attractive candidate for being the meaning of Orsino’s ‘dying fall’ discussed in Comm. 1414.

In Comm. 1379, I quoted another passage of this translation of Caccini:

‘There are some ... that in the *Tuning* of the first *Note* ([presumably] of a point (motive)], Tune it a *Third* under: Others Tune the said first *Note* in its proper *Tune*, always increasing it in Lowdness, saying, that this is a good way of putting forth the *Voice* gracefully. Concerning the first: Since it is not a general Rule, because it agrees not in many Cords, although in such places as it may be used, it has now become so ordinary, that instead of being a Grace (because some stay too long in the third *Note* under, whereas it should be but lightly touched) it is rather tedious to the *Ear*; ...’. He went on by saying that he ‘would chuse the second for the Increasing of the *Voice*’.

On reconsideration, I do not now agree with my editorial brackets in the first line. He was referring to how to perform individual written notes, and the first vocal practice mentioned had at least two different notes in the performance. We have probably all heard folk singers who habitually start notes with a little grunt pitched about a third below the proper note, with a portamento up to it as the tone builds. It is likely that a practice like this was what Caccini found acceptable, but giving proper voice to the first note and dwelling on it had become boring to him. Caccini’s second way of producing a written note was to tune its first note ‘in its proper *Tune*, always increasing it in Lowdness’. Possibilities of what the other notes
might have been are: from a Grace, going sharp or flat for expression, or leading to the next note with a portamento.

He introduced both of these ways to perform a note as ‘Tuning being used for the most part in two fashions, we will consider both of the one and the other: and by the following Notes will shew that which to me seemeth more proper to other effects’. What Caccini was saying here is that these two ways of producing notes were the most popular, he would evaluate them, and afterwards give an alternative which is better. That alternative later given, in contrast with the second way, was:

‘to Tune the first Note in its proper Tune, diminishing it; because Exclamation is the principal means to move the affection; and Exclamation properly is no other thing, but the slacking of the Voice to re-inforce it somewhat more. Whereas Increasing of the Voice in the Treble Part, especially in feined Voices, doth oftentimes become harsh, and unsufferable to the Hearing, as upon divers occasions I have heard. Undoubtedly therefore, as an affection more proper to move, it will work a better effect to Tune the Voice diminishing it, rather than Increasing of it: Because in the first of these ways now mentioned, when a man Increases the Voice, to make an Exclamation, it is needful that in slacking of it, he Increase it the more. And therefore I have said that it showeth harsh and rough. But in the Diminishing of the Voice it will work a quite contrary effect, because when the Voice is slacked, then to give it a little spirit, will always make it more passionate. Besides that also, using sometimes one, sometimes another, variety may be used, which is very necessary in this Art, so that it be directed to the said end."

As I understand this passage, an Exclamation was a quick increase in loudness followed by a much slower ‘slackening’. The alternative way described here started with an Exclamation. The previous way (i.e. ‘the first of these ways now mentioned’ and the original second way) started softly and slowly increased in volume. If an Exclamation were applied to the previous way, it would start when some volume had already built up, with the added volume of the Exclamation tending to make the sound harsh. What is not clear in the third line of the quote is how slacking the voice reinforced it. The 10th line helps since it implies that during the slackening, something other than just decreasing sound volume of the voice gave it ‘a little spirit’ that made it ‘more passionate’.

Caccini then gave a musical example, where a ‘more languid’ Exclamation is performed on a dotted minim followed by a crotchet a tone lower (to the words ‘Cor mio”), while ‘a livelier Exclamation’ is performed on a dotted minim (to the word ‘deh’) with the following quaver a sixth below. What is very illuminating here is that the power of the Exclamation depends on the interval to the next note. Caccini wrote:

‘For in the first Minim with the Prick, you may Tune cor mio, diminishing it by little and little, and in the falling of the Crotchet increase the Voice with a little more spirit, and it will become an Exclamation passionate enough, though in a note that falls but one degree: But much more spriteful will it appear in the word deh, by holding of a Note that falls not by one degree: As likewise it will become most sweet by the taking of the greater Sixth that falls by a leap.’

If Caccini’s use of the word ‘falls’ here referred to the graces discussed above, the end of the note having an Exclamation had a tirade down to the following note. If his meaning was more general, involving just a lowering of pitch, this only makes sense to me if the Exclamation ended either with such a tirade or with a portamento to the next note. The difference between these two possibilities may be more academic than real. The word ‘slacking’ applied to the Exclamation then referred to both a lowering of volume and a lowering of pitch.

Caccini later gave a song Deh dove son fuggiti where he labelled the notes that were to have an Exclamation and those to have a Trillo. All were minims or longer, and were followed by notes of lower pitch.

I strongly suspect that the emotional impact of the ‘dying fall’ derived from its imitation of a sigh. That imitation would be more accurate with the uniform pitch drop of a portamento.
New Braille Codes for some Early Music notations
Barbara C. Williams
(11 Aird St. Camberwell 3124 VIC Australia)

These codes make it possible for the first time, for blind musicians to have access to manuscript information, so they can do the proper detailed study of the sources like everybody else, and not be dependent upon modern editions.

I wish to make the codes known, because they can only be helpful if they are known to exist! They are, from later to earlier:

FIGBY for baroque figured bass - just for the figures, the rest is appropriately expressed in regular braille music code.
LUTAB for lute tablatures, English/French and Italian (not German, different system entirely) and similar plucked string tablatures.
PASCO for mensural notations, black and white, when there is a reasonable degree of certainty about what the shapes are. This is designed to be usable at about the same speed as a braille music copy can normally be read.
HEXIMUS for earlier or obscure manuscripts when a more pictorial approach is essential, a coded listing of shapes. The greatest possible correspondence of elements is used, if a note has a down-stem on the right, it will have one there in braille also, within the limits of fixed cell-sizes of braille machines.

HEXIMUS was obviously first researched as a 16-dot cell, on a hand-frame made by my father in the shed. But it became clear that two 8's were just as tactile-efficient if one coded in the boundary meanings, and then ordinary braille machines could be used to produce it.

All my codes are practical on a Perkins brailer, so transcripts can be made from the dictation of a sighted friend or fellow class-member. They flow on from braille and braille music principles and knowledge, and have been trialled on blind friends in several countries, to ensure tactile comfort and the best possible codicological solutions.

Louis Braille, born 1809, was blinded as a small child, went to the Paris blind school in 1819, and there with the other students in the early 1820s developed the wonderful system of raised dot patterns known throughout the world as Braille. Each language has its own match between the dot-code patterns and its own alphabet and commonest words, and many languages also have extra short forms for efficiency in reading and writing.

Louis Braille also developed the Braille Music Code, which is used internationally. In the six-dot pattern of the ‘cell’ (2 dots across by 3 down) there are only 64 shapes, of which
one is the absence of all dots, a space. So all braille codes use the same 63 signs, but with different meanings assigned to them. Thus the same sign means something totally different if you are reading maths, from music, or ordinary writing. All signs are used in each code, there are no 'spares'. This is perfectly OK, necessary, and efficient for these codes to work well. And naturally it is important to preserve the clarity and integrity of existing codes.

However, it does mean that if anyone wants to develop new codes, they have a dilemma: can the same symbols be loaded up with yet more sets of meanings, or should we go for an 8-dot cell, and use previously unassigned shapes to express the new code's meanings?

My codes actually do both: the simple ones, LUTAB and FIGBY use the standard 6 dot shapes because there is not such a large vocabulary of signs needed; whereas PASCO for mensural notation and HEXIMUS use 8-dot shapes for pictorial elements like ligatures, and to modify the regular 6-dot shapes. An enormous lot of research went into all this, of course, and it was all quite exciting. Not many people are in my position of having little enough sight to read braille by touch, but also to use visual sources with magnification and special equipment: so it seemed to be my task to make the bridge.

The advent of enlarging photocopiers made it possible. When the early types came to the blind school in 1981 I could see facsimiles for the first time. Naturally I was horrified at the inaccuracy of modern editions, so worked full bore in all spare time to become fluent in the old notations and to develop new tactile codes to represent them. It is important that braille users have equal opportunity in any music or musicology field. By good fortune, a few years later a medieval group called Tre Fontane, invited me to be their bowed-string player, which gave me plenty of practice at playing from manuscripts. We prided ourselves on using original sources, and had seven years of happy performing.

Then it seemed important for me to present the work as a PhD through an academic institution, both to spread the word in the place where students normally first meet manuscripts in early music courses, and to be sure it was taken seriously as reliable work. In that form it is called:

**Braille: New Codes for Early Music Notations, Long Cells, and Exploratory Coding Analysis**

(University of Monash, 1995, Melbourne Australia)

but the individual sections can be had from me separately in braille, print, or on computer disk by anyone interested. Blind musicians have enormous potential in musicology and as authentic performance practice artists, with a strong aural imagination and keen memory being part of our stock-in-trade. These codes can strengthen our position. Please make them known if you have opportunity. Thankyou.
I went to Paris in May because my wife had a conference there. It was a difficult choice between the AMIS Conference in Vermillion, to which I had had a warm invitation, and Paris, but in the end, much as I want one day to visit the Shrine to Music, the cheaper fare, the help and support I could give Gwen, and the fact that I had not seen any of the museums there since 1970, put Paris ahead.

I was able to visit all the more important museums; one advantage of being a member of ICOM, the International Council of Museums, of which CIMCIM is the musical instrument offshoot, is that the ICOM card gives you free entry into most museums. This is particularly important in Paris where admission tends to be more expensive than in England, where only a few museums charge anyway. Even museum postcards are much more expensive in Paris than here, the usual price being 5 francs, about 75p in English against our usual 20p or 25p – if I were still in charge of the Bate Collection I might have some thoughts about that!

The most important museum for us is, of course, the new Musée de la Musique, successor to the Conservatoire Museum, but this is not yet open to the public. I wrote to them before travelling and they very kindly let me come to see the building while it was still under construction, and they were very welcoming. We were shown all round the museum by François Arné, who is one of those responsible for European instruments, and Philippe Bruguère, who is responsible for the non-European. We saw many empty showcases and a very few instruments. We saw, also, why the museum, which was supposed to open at least a year ago, had not done so, and why it does not look likely that it will open by the currently planned date of mid-January next.

Like some new museums here, the Pitt Rivers Balfour Building and the Bate Collection, for example, they are architect-plagued, and plagued even worse than either of those examples. The museum was designed as a project by Henri Loyrette, who has had the excellent sense to get well away and become the director of the Musée d’Orsay (the old railway station which is now an art gallery) so that he will not have to live with all his mistakes. The architect responsible for executing (a word I use deliberately) his intentions was Franck Hammoutène, who seemed never to have visited a museum. Both proved unwilling to listen, in advance or at any stage, to those who had, and, far worse, they declined to listen to those who were going to have to work there. The curators were actually told “Shut up – you are scholars, not designers.” For example, Loyrette and Hammoutène used state-of-the-art fibre optic lighting, but fixed the lights so far from where the instruments were going to be that nothing could be seen of them. In other places, spotlights were carefully placed where they would shine on the spaces between the show cases, rather than into them. Worse were the problems with the floor, for many of the wooden slats of the parquet floor have now twisted and come loose and those few instruments which were in their places are being removed so that the floors and the lighting can be redone.

The structures which support the instruments are excellently designed (by the curators and the conservators – not by the architects!); very secure, comparatively unobtrusive, and it looks as though things will be easily removed when necessary for access – certainly they have almost all now been removed! Opening the cases, though, will be less easy, for these were designed by the architects and many are fronted by huge sheets of sliding glass, three or four metres high which rest on, and slide on, the floor but
which are secured only in tracks set into the ceiling - a truly terrifying task. I would expect them to jam very easily in the tracks unless they are pushed very carefully almost exactly on their centre line - the slightest extra pressure below the line will push up one end and cause it to jam. There are also several free-standing sheets of fixed glass, apparently as a design feature to make people pass to one side or the other, which are all-but invisible in the rather dim lighting and are accidents waiting to occur. Other architect-designed perils are the fittings which join one sheet of glass to the next, which are semicircular in section, projecting about a centimetre and knife-edged, waiting for a child to run its hand along the front of the case. Another is the staircases from floor to floor, which contract in width as they go upwards. Thus the bottom step is perhaps four foot wide, and the uppermost two foot. At least in emergency people will be escaping downwards, in which direction the stairs widen, but just imagine the usual horde of school kids rushing up to the next floor and all falling over each other as they go! Anyone over about 5 foot 10 inches tall is going to have to be very careful - there are low concrete arches ("a design feature") which I had to stoop to get under.

These are some of the reasons why I don't think the museum is going to meet the next deadline for opening. Even if the floor and the lighting can be done in time (and remember that in France all work shuts down for a month and more in the summer), I cannot see a safety inspector passing some of these things and allowing the place to open. A pity because many aspects are good. Many instruments will be fully visible because many cases are glass all round, with fittings to accept supports built into the glass (this makes for a somewhat inflexible display - spacing of fittings for lutes may be ideal today but less useful in the future if one day the whole setup is changed and it is decided to put clarinets, tubas, or flutes into that case). Storage space is excellent, with sliding racks like a library stack, fully secure both climatically and physically. At present the stores are occupied by the proportion of the collection which will be on display; once, and whenever, those instruments are back in the cases, the other 80% or so of the collection can come back from its distant stores and will be accessible to those who need to get at it. There is also an excellent new small concert hall for chamber concerts and this is fully a part of the museum, with the same climatic conditions, so that instruments can move safely from display to the platform. This has a modern Werkprinzip organ which is already being used by organ students from the Conservatoire.

The building is part of a complex on the old animal market site on the eastern edge of Paris. One building is the new Conservatoire, another is the new concert hall, both large modern buildings, and at the side of the concert hall is the new museum, the three together making up the Cité de la Musique. Thus the museum remains accessible to music students, even though in a different building, and it also has study facilities which will be open to the public. Gradually information on every instrument is getting on to computer, and there is a series of machines in the study room which will be able to access these files. This is one floor which is accessible to the public by lift - access to other floors is, for security reasons, accessible only by key. This means that disabled visitors will only be able to get into the museum under escort from a member of staff. Apparently once they are in there are ways for a wheelchair to get from one floor to another but the initial access is only by using a lift which needs a key to unlock it and another to enable it to stop at the first floor.

The conservation facilities are excellent. The laboratories in the new building have facilities for all normal work, including infrared and ultra-violet viewing, gassing for insects, and so on. There is space for X-raying, but not yet the equipment, and a separate photo studio and acoustic laboratory. They have also a larger laboratory in the old store building for anything really large and awkward
such as three-metre grands and church organs. They already have staff conservators for keyboards, plucked strings, and bowed strings, but not yet for wind instruments.

So in sum, they have some excellent facilities but a fair amount of disaster area, and anyone who has been waiting to get at any of the instruments in this museum needs to remain patient for quite a while longer. However, sometime in the next nine months to a year their patience should be rewarded with a good display of this famous collection. Meanwhile, I would like to record my appreciation of their hospitality to the new director of the Musée de la Musique, Marie-France Calas and to Philippe Bruguière and François Arné.

While it was disappointing to be able to see only a handful of instruments at the Musée de la Musique, the Louvre was much more disappointing. This museum is not just an art gallery with the Mona Lisa and Venus de Milo but combines our London National Gallery and British Museum. It has a famous collection of ancient Egyptian instruments (see the Catalogue des instruments de musique égyptiens by Christiane Ziegler, Paris, 1979), none of which was visible. When they excavated for the new entrance under the glass pyramid they discovered the remains of the mediaeval castle of the Louvre, and what little Egyptian material is on show is now round that, but today they are far more interested in the mediaeval remains than the Egyptian. There is also a display of the Arts of Islam, with wonderful ceramics and metal work, including weapons, but not one single instrument - whatever may be considered Islamic art, music is not included!

Also disappointing was the Museum of Arts of Africa and Oceania - again music is not included in Africa, though there are half a dozen or so Oceanic instruments, some good standing slit drums from Malekula and Ambrym and a horizontal one from Papua New Guinea, an interesting Marquesas side-blown conch with an added mouthpiece, and a rather dull New Zealand pu'utorino.

The Musée de l'Homme of course is another matter - this is one of the great museums with a good, if small, typological display on show including the famous neolithic lithophone (stone xylophone) from Vietnam and the multiple panpipes from the 'Are'are of the Solomon Isles collected by Hugo Zemp. Here, through the kindness of Lucie Rault, I was able to see much in the stores also, and met a few instruments which were new to me. Compared with the Musée de la Musique the storage conditions, especially for the larger instruments, are very simple, not to say primitive and over-crowded. Flutes, for example, are well arranged on a series of sheets of hardboard with holes in it, hinged in cupboards or lying in drawers, but other small instruments are piled in old shoe boxes. Like so many museums, money is short, but at least the instruments are all together and easily accessible.

This contrasts with the Musée des Arts et Traditions Populaire, where instruments are stored by accession number and are therefore widely scattered all over the museum. It is worth remembering that this museum covers all French folk material, including bands, etc, and thus has a number of instruments which one might expect to find in the Musée de la Musique. I have no idea what there is in the stores, but the display includes a serpent d'église and a fair amount of valved brass.

The display is divided into two parts. On the ground floor is the Cultural Gallery, where there is one large musical instrument show case and many instruments elsewhere in the gallery, wherever they are relevant to music and society in any aspect. What is particularly valuable is the excellent labelling here which tells one what the instruments are used for. One fascinating group, very appropriately from Soufflenheim on the Rhine, is a folk tradition where young people gather on 13 May (presumably 2 May plus the eleven
days of calendrical reform) round a fountain. A boy whistles on a pottery cuckoo and a girl responds on a pottery nightingale; the boy then gives the girl a pottery money box in the shape of a mother and child, and she gives him one in the shape of a breast. Most other exhibits have comparable documentation.

Downstairs is the Study Gallery, where every form of artefact is displayed in profusion. If for example you want to know all the types of hoe or bill-hook used in France, here they are. Instruments appear in a number of areas, of course, including hunting (bird calls, signal instruments), farming (animal bells), and a good typological display of instruments themselves, following the Hornbostel & Sachs system (*Galpin Society Journal* XIV, 1961) ending with an excellent display of how some are made (principally iron cow bells and vielle à roue) and used (including a brass band). One superb set-up shows the whole process of casting a church bell, but apparently there is demand for this to be dismantled so that this case, which is the first one comes to, can be used for something else—a tragedy if it is, because it would be almost impossible to recreate in the future.

The only problem with this technological gallery is that there is no labelling at all. Every exhibit has a number, and these numbers relate to documentation supposedly, but not always, available in adjacent study carrels, but to my mind this is useless if what you want to know is what no.241 is, who made by and what used for, and then no.65. The fairly-newly appointed curator of instruments, Florence Getrau, is very conscious of this problem, but whether she will be allowed to label musical instruments when costumes, for example, are not labelled remains to be seen. Even if she is, there will still be the problem of the instruments displayed in other sections because they are also relevant there.

Another museum with a good deal of musical material, and one whose equivalent is to be found in every capital city and in many smaller cities, too, although one tends to forget about them as a source, is the Army Museum. The Paris one is in the Invalides and much, of course, is Napoleonic, but it starts in prehistoric times with a copy of a lur and then picks up from Louis XIII onwards. That gallery was shut, unfortunately, so I could not see whether they had any Arbeau-size side drums, and I did not try, for lack of time, to make any contacts with curators (save to try to correct one label which described half an English clarinet picked up on the battlefield of Waterloo as an oboe). Thereafter what they show most of, naturally, is side drums, but there are also two Johann Leonhard Ehe trumpets and the bell section only of a trumpet by Hanns Leonhard, Nürnberg, 1685, who is not in Waterhouse, *New Langwill Index. Also an Hautbois de Dragon*, which I assume means dragons rather than the fire-breathing creature, with no name stated but it looked like a Bizey; it was boxwood with three brass keys. There was a russian bassoon with a dragon head, the only thing in that particular showcase without a label, and a three-coiled small trompe labelled only Bavaria, which took a trumpet size mouthpiece. I could see that there was a maker's name but it was too far away to read. Their labelling left much to be desired from our point of view, but doubtless all the information is on record if one gets in touch with the right person. The worst example of this was a case which contained a handhorn, 6-key serpent, Frichot upright serpent, a boxwood and ivory oboe with at least seven keys, one of them a speaker, a fife, the bell section of a dragon-head trombone with a french horn Bb alto crook stuck in where the rest of the trombone should be—it looked rather fetching like that—a pair of cymbals, a jingling johnnie, an ebony and ivory clarinet with twelve keys, the speaker articulated to open on the front of the instrument, and a non-original mouthpiece, and not a single label among the lot of them. The only other particularly interesting instrument was a wooden *ophicleide*, again no name given. I had only dropped in on spec because a) it was opposite the Musée Rodin, b) it was raining, and
c) it was open on Tuesday when many other museums are shut, though it was a salutary reminder that one should always keep an eye on the military and regimental museums. I'd be willing to be that there rarities of great importance to us stashed away in such museums in almost every country.

One thing I've just noted is important: some museums in Paris close on Monday, and most on Tuesday, so a little advance planning gives one access to something on each day.

Perhaps the most beautiful museum is the Musée Cluny, which is housed partly in an abbey dating from around 1500 and partly in a Roman bath, parts of which survive up to 15 metres high. There is a famous series of twelfth century capitals showing musicians which I was incompetent enough to miss, and an even more famous series of tapestries of the Lady and the Unicorn from the end of the fifteenth century. One of these shows a very clear positive, with at least some accidentals and weights on the bellows the shape of a bar of Toblerone chocolate. There are 30 pipes, well scaled, in a simple double row. Another tapestry from the beginning of the sixteenth century shows a lady in an outdoor bath attended by a lutenist and a recorder player with a very Ganassi-like instrument as well as the more probably attendants for a bather.

Other than these museums, there are a couple of dealers with really hair-raising prices but quite lot of good things, especially brass and especially Sax; also some woodwind, but I'd be a bit careful of their strings and keyboards.

And perhaps most enjoyably of all, Bruno Kampmann (my opposite number in ACIMV which publishes Larigot, often reviewed in FoMRHIQ) invited us round to his flat where he has a fantastic collection, mainly of valved and keyed brass, which certainly outdoes the Bate Collection in that area, and I think also Edinburgh. He has published two editions of his catalogue, and a third is in preparation.

So all in all it was a good ten days (and quite fun to try the tunnel, though their organisation is really pretty amateur still). I hope that some of the above may be useful to some of you.
In the year, the Collection has been given the eight instruments comprising the New Violin Octet, made by (or under the supervision of) Carleen Hutchins. They have donated by Professor Emeritus Peter Fellgett. The Collection has also been given instruments by Mrs G.W. Anderson, William Waterhouse, and the St Andrew Orchestral Society, and other items by Dr Christopher Field and Julian Stapley Esq.

Two important instruments have been purchased for the Collection. A flute by the most eminent woodwind maker to have come from Edinburgh, John Mitchell Rose, has been bought with assistance from the National Fund for Acquisitions, the Pilgrim Trust and the Hope Scott Trust. A rare tenor trombone by François Riedlocker of Paris (circa 1800) with original wooden case has been bought with assistance from the National Fund for Acquisitions, the Pilgrim Trust and Mrs Kerr’s Bequest in the Faculty of Music. The National Fund for Acquisitions is administered with Government funds by the National Museums of Scotland.

The Endowment Fund has been augmented by a donation of £10,000 from Russell Trust. The income from this will be used solely for additions to the Collection.

The cataloguing programme has continued to advance: four further fascicles of descriptive text have been published. These cover (1) viols & violins, (2) clarinets, (3) stringed instruments of regional cultures worldwide and (4) ancillary equipment. In addition to the printed editions, they have also been published electronically. A further donation towards the Cataloguing project has been received from the Binks Trust. A part of the Catalogue has been mounted on the World Wide Web (apparently making EUCHMI the first musical instrument collection to have substantial useful information on www pages): an ‘electronic picture gallery’ containing a ‘virtual catalogue’ has been created, consisting so far of 58 pictures showing some 84 items (supplementing Volume 1 of the Collection’s Catalogue). The ‘gallery’ can be viewed at

http://www.music.ed.ac.uk/euchmi/

Further information about the Collection can also be found here.

Two further technical drawings have been published, of the anonymous Terz Guitar and a guitar by Louis Panormo, prepared for the Collection by Darryl Martin. These bring the total number of workshop drawings on sale to 35.

Following the concert organised by the Faculty of Music using the New Violin Octet, the Collection hosted a well-attended Colloquium in February in which the scientific and musical achievements and prospects for the New Violin Octet were discussed.

For part of the year, the Collection has benefitted from a programme of work undertaken by Joanna Archibald with grant-aid funding from the Scottish Museums Council. This has resulted in improved display of 75 instruments and improved storage facilities for 150 instruments.

The Honorary Curator represented the University at the Triennial General Assembly of the International Council of Museums and the meeting of CIMCIM in Stavanger.

The Collection has been used for teaching purposes by University Staff, in particular for courses in the Faculty of Music on the History of Instruments, Ethnomusicology and Musical Acoustics. Several parties have made organised visits, and various scholars and instrument makers have visited to study particular instruments.
Much speculation has arisen in early music circles as to the condition and even the very nature of the shawm which was recovered from the "Mary Rose" in 1990, but which has not been put on public display. In the January 1983 issue of "Early Music", Frances Palmer described the instrument, along with others from Henry VII's flagship, and provided architectural drawings of it. Unfortunately, these drawings do not give details of the internal structure of the bell section, although the inner profile of the fingerhole section indicates an instrument with a narrow cylindrical bore.

As soon as this article appeared in "Early Music", I embarked on the making of a reconstruction, based on the accompanying drawings and the given length, with some guesswork as to the internal nature of the bell section. My instrument was described by Jeremy Montagu in the January 1984 FoMAHI Quarterly. Coincidentally with the completion of my instrument, an article by Herbert W. Myers appeared in the July 1983 issue of "Early Music". In it he argued very convincingly that the "Mary Rose" instrument was not a normal conically bored shawm as suggested by Frances Palmer, but the sole example of a cylindrically bored shawm, "dulcina", "doucaine", or "still shawm" to have survived from the Renaissance. This proposition was strengthened by the fact that my reconstruction, based on the same premises, functioned extremely well.

The Mary Rose Trust were unable to meet my immediate request for further information about the bell section. The non-appearance of the instrument at the UKIC and V S A Christmas symposium on Early Musical Instruments, (described by Jeremy Montagu in the January 1984 FoMAHI Quarterly), as promised and advertised, prompted the theory that the instrument had perhaps disintegrated through lack of proper conservation.

Shortly afterwards, in FoMAHI Quarterly of April 1984, Graham Lyndon-Jones proposed the theory that the Mary Rose instrument, (in spite of the presence of a thumbhole, and the apparent indication of a cylindrical bore in the drawing of the fingerhole section), really had a gently tapering bore, and was a conically bored shawm.

After this, despite much speculative discussion, no more appears to have been written about the instrument. A paper on the subject of it was given by me at a meeting of the Galpin Society in Edinburgh, after which I presented my original reconstruction to the Edinburgh University Collection of Historic Musical Instruments, where it is now on display. Repeated written enquiries to the Mary Rose Trust over a period of twelve years were initially evaded, and latterly
ignored. It was with great joy, therefore, that by means of a telephone call earlier this year to Alexandra Hildred, Head of Research at the Mary Rose Trust, a request to examine the shawm was immediately granted.

In April of this year I made a visit to the Mary Rose Exhibition in Portsmouth, and was received most cordially by Andrew Elkerton, Head of Documentation, and his staff. I was shown all the component parts of the shawm, which have received conservative treatment, and are now in store, the brass parts having been separated from those made of wood. I was able to examine the internal structure of the instrument; this examination confirmed that it is indeed a "dulcina", "doucaine" or "still shawm" with a narrow cylindrical bore.

There are on permanent display at the Mary Rose Exhibition two versions of the instrument. The first of these is a replica of the instrument in the rather fractured state in which it was found on the "Mary Rose", while the second is a reconstruction as it originally might have been. Very curiously, I was informed that the latter was not built to be played. My visit, therefore, gave Andrew Elkerton and the conservation team who had worked on the preservation of the shawm their first opportunity in 15 years of hearing a reconstruction actually being played.

Negotiations are now in progress with the Mary Rose Trust on the possibility of my publishing a full description and account of this unique instrument.
Hautboy and other Taxonomy – Further to Comm.1429

It is a number of years since I tried to start a discussion on taxonomy of instrument parts (it was after the CIMCIM meeting in Oxford ten or more years ago) and I apologise that I allowed it to peter out. I am not sure whether the accumulated notes got left in the Bate, got lost in the move, or are among the boxes of unsorted papers brought back and now obstructing much of the floor of my study, but I will try to sort them out in due course and as and when I manage to find them, which so far I have failed to do.

Meanwhile, perhaps I may make some comments on Bruce’s excellent suggestions.

For ivory and other ‘mounts’ I prefer ‘ferules’ to ‘rings’ for two reasons: a) it is an established term (cf Bruce on his previous page), and b) we need ‘rings’ for the wooden integrally turned protrusions which house the keys. Where possible, one should avoid using a term to mean two different things. It’s not always possible and context can usually, as in this case, make meaning obvious, and here, for instance, I would quite happily use bell ring rather than bell ferrule for an ivory or metal mount round the mouth of the bell.

As for ‘the wooden integrally turned protrusions which house the keys’, on three-key oboes they are indeed normally rings, but on flutes and clarinets they are often ‘blocks’ and, for E flat keys on flutes and A flat/e flat keys on clarinets, ‘bulges’ (as far as I remember I have alternative suggestions from other people in the files for these, especially the latter).

On Bruce’s drawing of the Center Joint (p.32) we need a term for the area cut away round the hole for the key to rest on – perhaps ‘key seat’ or ‘key flat’ would be acceptable, and we could do with a term also for that very small sloped area at its lower edge – ‘key seat chamfer’ is long-winded but I think clear.

On the keys themselves (p.34), I cannot accept ‘pad’ for the lowest portion (I hope we are all agreed that the part nearest the player’s mouth is the top, even if we have to be careful with bassoons and curtals) simply because ‘pad’ is the conventional term for the piece of leather (other materials on later instruments) which is adhered to it with shellac, sealing wax, etc. I would suggest ‘head’. I dislike Phil Young’s ‘flap’ partly because it suggests something flapping around loose and partly because it is only accurate (and even then much more tightly controlled than ‘flap’ suggests) for the head of two-part keys like the oboe C-key (the upper drawing on p.34). Nothing ‘flaps’ on the E flat key.

I think that other than these I am happy with Bruce’s suggestions, though I wonder slightly why he prefers ‘finial recess’ to the normally used ‘reed well’.

He does not discuss the interior at all (except for the ‘widest bore’ behind the bell ‘lip’. Is ‘top of the bore’ acceptable for the narrowest point, at the bottom of the ‘reed well’ – this is a distinct problem with the oboe because it implies that the reed staple goes down to the bottom of the well, whereas most players seem to prefer to leave a gap between the bottom of the staple and the narrowest point.

Two points on the bell drawing (p.33) are not named. Is everyone happy with ‘bell vent’ for the hole in the waist? And for ‘left’ and ‘right’ as seen by the player looking down the instrument from the top? This does not arise as a problem with the E flat keys because one would say ‘left-hand’ and ‘right-hand’ according to which little finger would operate them. The other is the area between the ‘flare beads’ and the ‘rim beads’ which, on later oboes, sometimes after a much shorter flare becomes the ‘bell cylinder’ perhaps?

I will try to resurrect the papers from earlier discussions for a later Comm, but meanwhile, let us start again. This is a case where, for those of us that have it, email may be useful to get some more rapid exchanges than quarterly publication makes possible. I have included all the email addresses I have in last quarter’s 1996 Members List – if there are any more, do let me have them.
WOODWIND TAXONOMY

The Comm. 1429 on Hautboy taxonomy by Bruce Haines is excellent, and long overdue. I hope it starts a good discussion as he suggests, and even more, that the discussion leads to action and improvement by those who are maybe so deeply entrenched in traditional terms that they neither have thought of, nor would wish for, change.

I wish to expand on one paragraph only in Bruce's Comm., namely that dealing with ferrules, rings and mounts.

The term mount can mean anything from a large hill, a horse or other steed, to a ferrule, ring, tip, band, a turned ring on an instrument (sometimes partially cut away) for supporting a key, a metal "saddle" to hold a key, also metal posts screwed into the body of the instrument, and so on. It should be perfectly clear when the mount being referred to is geographical or equine, but it is certainly not clear when used in relation to a musical instrument.

The time is long overdue to clarify the use of that vague word, by eliminating its use from auctioneers' catalogues, museum and collectors' checklists, catalogues, descriptions and the like.

Bruce's use of the term ferrule goes a long way towards correcting the matter. Webster's dictionary (and also Oxford's) clearly describe what a ferrule is and does. A band or ring of material (ivory, horn, metal etc.) put around an instrument for strengthening and/or decorative purposes is surely a ferrule, and shouldn't be called anything else. I have always used the word ferrule for a ferrule, and wish more would do so. A ferrule is a ferrule.

The term "mount" is not only vague, but can be positively confusing. Surely, in naming or describing something, in whatever language, the purpose is communication. If communication is not clear and unambiguous, it is a waste of everybody's time and effort. Perhaps it better to avoid the word "mount" completely unless it is qualified, not with a description of its material such as "ivory" or "silver", but with a word that describes its purpose, such as "key mount".

The only time I use the word "mount" is in describing the method of key attachment of those instruments where a complete or partial ring has been left standing when the instrument was turned. If the ring goes right around the instrument I refer to it as having "integral wood (or in some cases, ivory) key mounts". If part of this ring has been removed, leaving shoulders to support the key and its axle, I refer to it as having "integral wood (or whatever) key blocks". The operative word here is "integral", meaning it is an integral part of the instrument's body, and has not been added later in manufacture, as has a ferrule.

This may not be the perfect description, but is the best I have coined so far. Perhaps Bruce and others can suggest better?

Again because the term "ring" can be confused with the rings on keys of later instruments, surely regardless of what turners used to, or still, call "rings", it is better to avoid this term also to avoid confusion.
Long Hole Augers

With reference to Comm 1412, some advantages over the standard 'D' bit tip grind can be obtained by adopting a tip grind borrowed from commercial gun-drills. I have found these to be:
1. Smoother finish, even though one is withdrawing constantly for chip clearance.
2. Better centreing on a previous bore (e.g. when step-drilling).
4. Freer cutting.

Details of the grind I use are shown below.
The procedure is as follows (steps 1 and 2 are similar to those described in Comm 1412):

1. File or grind away half the diameter at the tip. Err on the side of caution; to leave slightly more than half the diameter is infinitely better than leaving slightly less. Take this between 5 and 7 times the diameter back from the tip. There is no point in more because of swarf build-up, though this proportion can be increased significantly if the auger is hollowed as described in Comm 1412, since there is more room for the swarf.

2. Grind the tip as for a 'D' bit to the angles shown, i.e. 20° to the right, and about 25° below.

3. Present the tip to the right side face of the grinding wheel, as though grinding a twist drill, angling the shank towards you by 30° from the axis of the grinder. Using the same action as for grinding a twist drill, develop a small curved facet on the leading edge of the auger, until the new leading tip is one-quarter of the diameter towards the centre, and the facet tails off to nothing roughly in the centre of the underneath.

4. Using a fine slip stone, remove the burr from the junction between the grind and the underneath surface of the auger, but of the three changes in angle on the top surface, leave the two on the left untouched.

Such augers tend to bind in wood unless steps are taken to reduce the shank. Intuitively you might think that leaving the whole tool at boring diameter is more likely to make it go straight. I have not found this to be true, and certainly on the commercial gun-drills which I have, the length of the full-diameter tip is not more than 4 times the diameter. Therefore there is everything to be gained by reducing the shank. So treat the tool as a tip, and leaving a couple of diameters worth of unreduced material at the shank end, braze it onto a reduced diameter shank.

On large sizes, say above 12mm, this also results in a considerable economy of material, particularly if you use detachable tips threaded onto a single general purpose shank.

An alternative method which works well on sizes at least up to 13mm, and does not seem increase the tendency to wander, is to place the flat of the tip on an anvil, and give the back of the auger a good whack with a heavy hammer. This will increase the tip width by a few 10ths of a mm. Naturally this method is no good if you want the bore to measure the same as the diameter of the auger before whacking.
Donald Gill is quite right in what he says about angle-iron reamers (Comm 1435). It may be that you have to put up with the back of the reamer rubbing only at either end. (an over-all convex bore) or in the middle (an over-all concave bore), and you’re going to need to scribe lines down either side of the angle-iron and file metal away in relation to these if the bore you want is other than straight.

Might the following help?

Take a piece of threaded rod. Cut a slot in one end wide and deep enough to take a washer. At right angles to this drill a hole through the end. You can now put a washer in the slot and hold it in by putting a rod of some sort through the drilled hole.

Take a metal tube whose internal diameter is a little greater than the diameter of the threaded rod but whose length is a little less. Cut a slot in one end wide and deep enough to take a washer.

Slide the threaded rod into this tube, letting the washer fit into the slot in the tube. Screw a nut on the end of the rod which protrudes from the other end of the tube. This constitutes your reamer.

Washers are cheap, and if a dozen or so are held tightly between two nuts on a short length of threaded rod, this can be held in a lathe chuck and filed to produce a cone of washers each differing in diameter from the next by a small amount and each with a cutting edge all the way round.

Mark lengths on the outside of the tube so that you know how far to put the reamer into the bore.

Hold one end of the workpiece in a chuck and the other in a steady ("spectacles"), so that the end of the bore is open for insertion of the reamer.

Slowly does it, but it should be possible to copy any bore (within the limits of the dimensions of available reamer components) with fair accuracy.

Incidentally, I once did bore diagrams of the three upper joints of a William Henry Potter six-key flute and found that they all appeared to use the same reamer, the shorter two merely being exactly like the longest but cut short at the narrower end.
My Comm 1433 went through a number of drafts, and at one point was actually submitted and withdrawn because Eph Segerman very helpfully sent me the first page of the Arban Méthode showing that I hadn't got Arban quite right. I should have acknowledged his help in the version I finally submitted, but forgot. Sorry, Eph.

But having got that Comm off my chest, I went back to look at Comms 1200, 1327, and 1371-3, because I had misgivings about aspects of the measurements. I believe I am right in thinking that the lengths allowed for mouthpieces are taken linearly from the Praetorius drawings. But in playing, it is the volume of the mouthpiece which makes a significant contribution to pitch. At f2, the effect is of a length of tubing of equivalent volume to the mouthpiece. Thus a cup volume of 10cc equates to 127mm of a tube 10mm in diameter at f2.

If the Schnitzer mouthpiece (Comm 1371 para. 6) adds 60mm to the length of the instrument, and since, presumably, a little of the shank protrudes, then the cup could add an inch or so due to its Le (equivalent length, see Benade) when the instrument is played, which should lower the pitch a little below what measurement of the drawings suggests.

There are a couple more little points I would like to hear more discussion on. In Comm 1371 para 5, I read "length changes by a factor of 1.062 for each equal-tempered semitone". I thought the factor would be 1.059463, this being the twelfth root of 2 (and that this would apply in all size ranges). This only means a reduction of 7mm in the length of the increase needed to go down a semitone from first to second position in the Gemtine sackbut, but might it be enough to suggest a slightly higher pitch (than what I am not sure. I get a bit lost in the rest of the para).

I also get a bit uneasy about references to lipping. It is certainly possible to lip notes to a slightly different pitch, essential on, say, an uncompensated three-valve tuba, and obviously early trumpet players had to deal with odd partials. But the latter were surely largely spared these by kindly composers, and with the former, the lipping is mostly downwards, which is easier. I would find it hard to believe than any player would want to depart far from the easiest pitch at which his instrument would play, nor would he find it physically possible to do so for long.

I might also mention that two fingers-breadths of extension from first position on either of my bass trombones lowers the pitch by nearly a semitone. From first to second is much less than the distance between other semitones, and yet I appear to be in tune. If I applied this to the citations of Praetorius in these Comms. I would conclude that the Gemtine sackbut played at rather more than half a semitone sharper with the slide retracted.

What you can infer from an instrument and what a player will do with it may not always be on all fours. Or please will someone set me right?
Referring to Comm 1433, ‘Brass Mouthpieces’

Roy Chiverton’s analytical approach to mouthpiece design is very much to be welcomed. One or two of the concepts mentioned in this Comm. perhaps deserve further discussion. Whereas the function of the mouthpiece cup in supporting modes of resonance is well known and generally accepted, the “popping frequency” of the mouthpiece in isolation can be only such a rough indication of Helmholtz resonance frequency of the mouthpiece when in the instrument that it is more likely than not to be misleading. The pitch of the sound obtained by slapping the mouthpiece cup on a surface such as the palm of a hand does not only depend on the cup volume and throat cross-sectional area, but also on the length and shape of the backbore. This can be simply tested by extending the backbore with a shank or even a rolled slip of paper. The “popping frequency” can be considerably lowered by a small extension of the backbore, and therefore depends in an unmeaningful way on the length and shape of the backbore. When a mouthpiece is placed in the instrument for use, the backbore of the mouthpiece merges into and forms part of the bore of the instrument. In most instruments the taper of the backbore is continued (after the inevitable small discontinuity) by the taper of the leadpipe. The column of air inside the backbore in isolation is not a critical feature of the whole system of instrument, mouthpiece and player.

In the case of a cavity vented by a cylindrical tube, the square of the resonance frequency is proportional to the cross-sectional area of the cylinder and inversely proportional to the volume of the cavity and the length of the cylinder [1]. The mouthpiece backbore is not in general cylindrical, but the popping frequency will clearly depend strongly on backbore length. When the mouthpiece is in place in the instrument, the calculation of the cavity resonance is not simple: the resonance frequency associated with the cup volume is substantially lowered, as the effective length of the backbore receives an additional contribution from the lead pipe and to some extent from the main air-column. Caussé, Kergomard and Lurton [2] report such discrepancies between popping frequency and the frequency of peak support for the modes of resonance of various mouthpieces attached to cylindrical tubes.

The effect of mouthpiece cup resonance on the sound quality is also more complex than a simple dependence on cup volume and throat cross-sectional area, though these are factors. For low notes on an instrument, the support given by the mouthpiece cup resonance for the upper harmonics in the sound spectrum will indeed be significant. For high notes, however, the Helmholtz frequency will be not far removed from the fundamental frequency of the note being played; here the effect of the mouthpiece cup resonance is to support the production of the fundamental of the note, and the support to its harmonics will be negligible. This is confirmed by one’s experience as a listener: it is difficult to distinguish the sounds of brass instruments of the same basic size playing high notes; instruments show their own character much more when playing low notes.

The listener’s perception of “brightness of sound” also depends on the starting transient characteristics as well as on the spectrum of the sustained sound, and throat shape seems likely to affect transients even if steady state sound is largely independent of cup shape detail. Some players consider that throat curvature affects the response of the system to the ‘attack’ of a note. This is an area very ripe for further research.
In Edinburgh we have made a start on a systematic study of mouthpieces with the publication at the beginning of this year of two fascicles [2, 3] together describing 435 mouthpieces, giving 10 or more measurements for each (the painstaking work of Dr Raymond Parks). The continuation of this work will include calculation of cup volume (to be based on further measurements rather than methods involving water) and publication of profiles plotted using a CAD package. It is intended to concentrate in the first place on the more important mouthpieces in Edinburgh which makers might wish to copy, but the methods could (and should, of course) be extended to historic specimens in other collections.


I would like to further contribute to the discussion about gut strings:

- Comm. 1440 (Mace and overspun strings). I find myself in total agreement with Segerman’s argumentation in his answer to J. Catch’s comm. 1396: we can exclude that the bass strings described by Mace (Lyons and deep red Pistoys) may have anything to do with overspune strings and it seems to me that he gives in no way any hints in that direction.

To support this argument we should pay particular attention to iconographical sources: the great absent from the various comments and much richer, in terms of quantity, than the extant historic written documentation.

May I stress the fact that iconography shows unequivocally and "objectively" (written documents express always, for better or worse, the author’s personal opinion) through many examples from different European geographical areas, that the Lute had all-gut strings, and not only in Mace’s time and Country, but also well beyond the end of the 17th century for a good part of the next one, as I tried to demonstrate, with arguments of an organological character, in my comm. 1350.

In fact, it would be really interesting if we could find some pictorial evidence showing the use of overspune strings on the Lute, as so evidently happens for bowed instruments.

For the latter, the earliest iconographic examples known to me are G. A. Gabbiani’s portraits of some musicians at the Medici’s court in palazzo Pitti in Florence: one among them, dated 1685, stands out in particular (see the cover of the Nov. 1990 issue of Early Music) where it is possible to perfectly identify (because of its white colour) the Violin’s 4th string, presumably overspun with silver wire. The remaining higher ones are dark yellow, the typical colour of natural gut.

The pictorial precision of paintings of musical subjects is certainly known to all and even surprising when we consider that in the portraits of some instruments it is possible to distinguish rather clearly even "demi filée" (open wound) strings from close wound ones (see, for ex., the details of the viola da gamba in Forqueray’s portrait).

The 4th, wound, strings of a Violin should be of a diameter comparable to the hipotetic wound bass strings of a Baroque Lute tuned in d-minor; therefore, if such were really the case, the latter should be noticeable exactly like the Violin’s fourt, in the paintings of that time.
Comm.1442 (Sinew strings...Yet again!). Somehow, J.Downing managed to convince me to try and experiment with the recipe for making strings with the sinews of horse’s back (comm.1417); but here it must be made clear that is a procedure of an exquisitely domestic nature, just like all other recipes in Rossello’s book (c.1574).

In others words, one things is the “professional” procedure followed by the string makers of the 17th c., another thing is the do-it-yourself recipe, which may well be totally foreign to the real procedure used by the Italian (in this case) professional string makers.

For the instance, in the recipe book the d. i. y. methods suggested for dyeing clothes require dyes and dyeing techniques that often have nothing to do with the artisan’s procedures normally employed.

That the strings obtainable through this recipe are not of the rope type can be inferred from a passage in the original ancient Venetian version where “...e filate lineali...” means “spun so as to obtain a smooth and uniform string”.

On the other hand the typical wool spinning wheel to be found in almost every household of the time allowed only simple twisting - no rope construction - of the fibers obtainable from the sinews of animals: hence the importance of employing glue as binder (in the recipe there is no mention of plastifying additives).

The reference to Italian string makers is no coincidence, since what the English called “Venice Catlins” was in fact manufactured only in Italy, in an area around Bologna and Venice, from where they were shipped to England and, I suppose, to the rest of northern Europe (may I remind that also the compiler of the Burwell’s Lute Tutor was English; understandable then his reference to the term “cats gutte” which finds no confirmation, together with the use of tendons or sinews to make harmonic strings, in any authentic French source of the time.

The research should then be preferably directed, in my opinion, towards the historical documentation coming from Italy. The fact is, we do not know what Italian musicians and makers in the 17th century called the Catlins strings: what we managed to document so far is a certain specialization in the gut string production centre.

Thus the thicker strings came preferably from Florence (means Pistoia?) and Bologna, whereas the thinner ones from Rome and Naples.

In August 1617, for ex., the Florentine lutist Michelangelo Galilei wrote his brother Galileo from Munich asking him to send “four thick strings from Florence for his own needs and his pupils...”.

In Alfonso II d’Este’s expense list for the period 1587-97 we read: “...210 dozens thin strings sent from Rome to serve Music...” and “...denari 4 for four buckets of thick strings spe-
cially made in Florence..." (Elio Durante e Anna Martellotti: "Un decennio di spese musicali alla corte di Ferrara", Schena editore; Archivio segreto Estense, Camera Ducale, Registri dei mandati fattoriali).

In the ten years covered by the expense list, the associations "Rome" to thin strings and "Florence" or "Bologna" to thick ones are repeated many times.

The gut strings production centers in 17th century-Italy were actually much more numerous; summarily listed: Modena, Milan, L'Aquila, Rome, Naples, Pistoia, Perugia, Salle, Bolognano, Venice and, not least, Padua.

Padua is of rather particular importance for our investigation not only because of its proximity to Venice and the active presence there of lute-makers such as Venere and Railich, but especially because it was exactly there that the English traveller Skippon (c.1660-70) described the only example known to us of the manufacturing process followed by an Italian string maker active in the area and at the time where Venice Catlins were produced.

Now, the Paduan string maker employed exclusively the guts of animals (lambs, weathers, kinds, wolves) and not sinews or tendons.

Skippon was, and I stress that, an Englishman and, for us a very interesting point, he felt obliged to point out to his readers (obviously English) that among the various sorts of gut employed by the string maker in question (who, I suppose, was also able to make, seen the area and period, what the English called Catlins) no "cats guts" were used.

The other Italian sources from the 1st half of the 17th century like the string makers' Statute in Rome and Naples (1642 and 1653/78: see at the end of this comm.) mention directly or indirectly the guts of lambs, certainly not tendons or sinews of any animals.

Skippon's remark to his readers deserves our attention. In other words we would be tempted to think that the English at that time were somehow curious to know whether the term by which they (and I underline they alone) called those strings had any connection with the actual raw material employed by string makers of that region, the only ones who produced Catlins strings in the whole of Europe (the French, as we know, produced exclusively the Lyons basses: unfortunately we have no way of knowing whether the manufacturing technology may have been somehow similar).

A second interpretation key revolves around the fact that maybe Skippon meant to explain his readers that among the guts of the sundry animals used by the Paduan string maker "...no cats guts" are used (and here I might add: "...like we do in England..."). This interpretation would do justice to the question of English harp strings made of animal sinews, as reported by J. Downing (comm.1395) and which I believe rather unlikely since, apart from
the historical reference to such harp strings, it is well documented that England imported large quantities of musical strings from Italy and France; in other words it was not a producer country, at least not to the extent of covering its own market with any appreciable local production. Curiously enough we find a remark on the subject in Virdung's "Musica Getutsch...", Basel 1511: "...all Lute strings must be of guts or entrails of sheep, although Boetius and other Musicians call them "nervos" as though they were made out of animal sinews...". This source is about half a century earlier than the first mention of Catlins.

Kircher, in his "Musurgia Universalis", Rome 1650 (pp. 440 and 476) remarks that musical strings can be made of gut from ram, lamb, sheep, cat (!) and other animals, but the best are always those made of ovines, sheep and...felines (!). Oxen and cow guts are too flaxid, while those of wolves are stronger.

To be noted that Kircher, on top of having had his book printed in Rome, where he mentions the number of single guts necessary to make up the strings for the five-string Violone or for the Lute he refers exclusively to the production of Roman string makers. Thus the term "cats guts" used by Skippon to describe the strings produced in the city of Padua strongly indicates the type of animal gut employed rather than tendons or sinews, also in consideration of the animals he mentions in his list, where in a logical continuation of it the cat would be missing.

Concerning the question from Shakespeare I think it must be regarded purely as a poetical licence, maybe a recall to the famous mythological event of Orpheus tripping over an empty turtle shell, thus causing the dried up "tendons" to vibrate; I have some doubts that Shakespeare may have been also an expert in stringmaking technology (which was, by the way, covered by secret in the guild; as is clear from the Roman and Neapolitan string makers' Statutes) of a Country, Italy, that was a month's a journey away by ship; but this is, of course, an unsupported opinion. About the 2nd edition of the Oxford English Dictionary, allegedly mentioning overspune Lute strings (comm.1442, note 1) I shall directly verify the original text and its context before expressing an opinion. The news that also in the 17th century gut strings (Minikins?) were sometimes varnished will certainly make modern string makers happy, me included.

Next summer I am planning to carry out a research through the archival documents in Florence, Pistoia and Bologna; with a pinch of luck I hope I can find something useful to the continuation of our debate.
ESVS, MARIA, ERASMVS


Congregati l'infraestruiti huomini dell'Arte di far corde di Leuto all'...

Elefeto del Fideliss. Popolo, pravio ordine di d° Sig. Giuseppe Vulturale...

Francesco Siuo.
Giosefpe della Monaca.
Antonio Siuo.
Giosefpe de. Magistro.
Gio: Laouo Monetta, e
Berdino di Giouanne.

Hauendo considerato essi di detta Arte che dal vitrossi quella senza regola, e modo di vivere, non può ricevere augumento alcuno, anzi uà in dies deteriorandosi e neo sono nati, e nascono altri inconvenieni: Per tanto acciò possa augmentarsi; & debuiarsi a detti inconuenienti, hanno conclusa, e stabilita la seguente Capitolaotione, da roborarsi con il beneplacito della Maestà
Sinews: a search for improvement or an excuse for complacency?

From the point of view of the history of technology and perhaps the history of strings, John Downing’s Comms. on sinews contain interesting information from early sources that very few of us have previously come across. The value they have is not affected in any way by John’s reasons for researching the topic. He has been quite clear about those reasons. Unhappy about the properties of gut strings for lutes, he is exploring an alternative with historical credentials that he expects to be ‘better’. The purpose of this Comm. is to encourage him to continue his investigation by following the procedures he has described and make some test strings and demonstrate the improved properties. He is an imaginative and competent technologist, and if anyone can do it, he can.

There are reasons though that could make him hesitate. As discussed in Comm. 1415, the vast majority of today’s lute players (including John) play on nylon strings. Whenever they are asked about the authenticity of their strings, their stock answer is that modern gut strings are not as good as the original gut strings used, and nylon is closer to those original strings. John has performed a service for them by putting the name ‘sinews’ to the material used in that mysterious lost art of making those original superior strings. John’s problem with a practical continuation of his research is that he will disappoint his nylon-playing friends no matter what the results of his research are:

If his expectations turn out to be true, and sinew strings are as ‘good’ as nylon, people like me will make and offer these strings to the lute players. They are quite happy with their nylon strings and will only be interested if the sinew strings are clearly ‘better’ than nylon. This is very unlikely, so they will stick with nylon, but will feel unhappy because they have lost their excuse. If John’s results are not up to his expectations, there will be considerable difficulty in finding another material with any historical credentials to pin the mystery on to. The excuse returns to whatever credibility it had before John started promoting sinews. So his friends want him to whip up talk about sinew strings, but not do anything about it. I hope that his commitment to exploring the history of technology is stronger than his commitment to justifying the use of nylon strings.

I should like to explain here why I don’t share John’s optimism about the superior properties of sinew strings, and so am not spending my time on a project to make them. First of all, there is no evidence for the commercial manufacture of sinew strings, while there is evidence for the commercial manufacture of strings made from sheep’s guts. If sinew strings were clearly superior to gut strings, any manufacturer who started making them would be at a considerable commercial advantage, and I can’t conceive of a reason why they wouldn’t have done it, and subsequently captured the whole strings market. My guess is that sinew strings were only made when sheep’s guts or commercial gut strings were not locally available.

There is some ambiguity about the names of string materials since early naming practices were not precise. Two materials which apparently had the same characteristics could easily have shared the same name or names. Since nerves and tendons (sinews) can look rather similar on dissecting an animal, their names could be shared in the vocabularies of some. Thus we have nerves mentioned as a string material, though strings actually made from nerves would be too weak to be useful. Since gut strings and sinews have similar looks and properties, name transpositions could readily have occurred between them. We can thus expect that the real material involved in some reports of sinew strings was gut, and the real material involved in some reports of gut strings could well be sinews. There is no ambiguity about gut strings made from sheep, on which the argument of the paragraph above is based.

My other reason for not expecting sinew strings to have physical properties that are remarkably different from gut strings is that both chemically (the composition and shapes of molecules) and physically (the molecular organisation), they are both made of the same material, collagen.
Peter's Comms. are always informative and constructive, and this one is no exception. It deserves careful consideration, and will try to do that, discussing his points in the order that they were presented, but when he mentioned it in more than one place, I may reserve my reply for where he gives the bulk of his argument. His point being discussed will be located by the page in Q83 (p) and the paragraph (§) or partial paragraph numbered from the top of the page.

p.65.§2. We both agree that lutes of 'normal' proportions (with an 8-fret neck) and those with a 10-12 fret neck and smaller body existed in the 16th century in England and elsewhere (I remember that there is also Spanish evidence for the latter). The iconography shows the former design much more often than the latter one. My impression is that Peter believes that the latter one was more commonly used in Consorts than the former one. The only evidence for this that he can offer is the Henry Unton painting which he dismisses on the next page as offering evidence of very poor quality. I accept this as a worthwhile piece of evidence which establishes the acceptability of long-necked treble lutes in Consorts, but it does not establish that they were preferred, which I think is his claim.

In support of Peter's speculation, Praetorius mentioned that the tremolo style, presumably with a quill, used by the English cittern player, had been acquired by some famous lutanists. I would be surprised if at least some professional dance-band lutanists didn't play with nails.

p.66.§5 (labelled 3). I think that Peter has his evidence and conclusions mixed up here. We know from the plays that cittern heads were considered stupid. We know that Robinson's head was on a cittern. There is no evidence indicating that Robinson's head was not typical. Therefore, Robinson's jester's head is evidence of what was considered stupid. Whether Peter or I think it fits 'exactly' is irrelevant. Peter may see a woman's head on the Praetorius cittern, but he cannot say that it is not a jester's head. Like the Robinson head, it has a point on top and is clean-shaven. It could well be that part of the fool stereotype is a man with poorly developed signs of masculinity.

§7 (labelled 1). My point was simply that it would appear incongruous for a clearly larger instrument to have a higher pitch. This would be the case if a 58 cm orpharion at g' played with a 45 cm cittern at e', as would occur in Allison's Psalms if the larger cittern were used. The incongruity would also be musical since contrast was an essential characteristic of the Consort, and in this case, the cittern could only reinforce the mid-range of the orpharion, while a cittern tuned an octave higher would complement the orpharion's sound with contrast.

§8 (labelled 2). I have no problem with the Unton fiddle player being 'a very inferior servant', or with the cittern having a peg-head rather than a pegbox. Evidence is to be cherished, not disparaged.

§9 (labelled 3). My distinction is not between social classes but between those in and out of the fashionable circles that produced the surviving repertoire 1585-1615. These circles centred on the royal establishment, and presumably included barbers and instrument makers to the fashionable and London theatrical personnel. In my scenario, when Meuler's strong phosphorus-steel strings became available around 1580, the orpharion was invented within this circle as a wire-strung alternative to the lute; and the small cittern, tuned at the high octave and switched to Italian tuning, was adopted as the cittern of choice. Information about fashion travelled fast between courts throughout Europe, and travelling English musicians would be expected to represent currently fashionable English music, which had acquired some fashionability throughout northern Europe around 1600. This explains, as no other scenario does, why Praetorius knew the small English cittern and no other English cittern.

Before the fashion switch in response to Meuler's strings, the fashionable cittern was the larger one using French tuning, with the small cittern (having the same relative tuning) playing a
minor role. This accounts for the Gilling castle and Eglantine table larger citterns, and we must assume that the Consorts that played for the Queen’s progresses in 1575 and 1578 included the larger citterns with French tuning at the low octave.

When the appropriate wire for the high-octave cittern became unavailable, the fashion involving its use in the Consort and as a solo instrument died as well in high-fashion circles. High fashion can change remarkably quickly, while I suspect that Peter thinks of early music practices as being like folk traditions, only changing relatively slowly. Changes in musical fashion work like evolution, with mutations (innovation) happening regularly, changing the mix of natural variation from which the fashion winners emerge.

Praetorius’s Englishman was an innovator with his use of tremolo and tuning the cittern like an octave lute or gittern. The tremolo caught on some as some lute players used it, but it never became part of mainstream lute technique. The gittern tuning remained as something to use on the small cittern after it lost fashionability (not being able to deliver any more the sound that was fashionable). Kelly and Pilkinton (mentioned in the 1656 Tabley ms) played the gittern descendent of the small cittern in the second quarter of the 17th century. That ms. mentioned no esteemed players of the larger cittern, and I wonder when it was resurrected.

That Englishman’s tuning was reentrant, making the fourth course not useful for the melodic tremolo technique. As far as I can remember, there is no evidence of reentrant tuning in the later gittern tablatures. This suggests that the Englishman’s stringing was to accommodate the gittern or octave lute tunings Praetorius gave plus standard cittern tuning. To switch from gittern (or octave lute) tuning to cittern tuning, one exchanges the second and fourth courses by crossing or uncrossing them between the tail fixing and the bridge and between the nut and the pegs (strings needn’t be taken off or put on the instrument which, with wire strings, entails a risk of breakage). This provides the correct relative cittern pitches when from gittern tuning (called by Praetorius in chordavalle), or if it is was octave lute tuning, the third course would be a semitone lower. The e" first course tuning was presumably in Praetorius’s Chorthon tuning, and on conversion to cittern tuning, strings would generally be tuned down a semitone to have the first course in e’ at Cammerthon pitch or be tuned down a minor third to be in e’ at Chorthon pitch. Evidence that Praetorius’s small English cittern tuning was not in Cammerthon is the fact that this tuning was not listed in the table of tunings which were all supposed to be in Cammerthon.

The connection of the cittern with the theatre is directly demonstrated by the cittern head, which can only be a theatrical stereotype of a fool.

p.67. Peter is clearly not being objective here. The validity of an historical hypothesis depends on how well it fits all of the evidence. Evidence that there was no choice of cittern size or pitch level in the fashionable repertoire of the cittern is that Morley and Rosseter otherwise specified all instrument size names. Evidence of the small size is that this size was the only English one Praetorius knew of, and the extreme stretches the music calls for. Evidence for the high pitch level is that this was the pitch level of the Praetorius English cittern, and that this repertoire with Italian 4-course tuning begins with the availability of the wire that allows it and ends with the demise of supplies of this wire. There is no evidence not reasonably explained. I can’t say the same for Peter’s hypothesis.

§3&4. I never claimed that the Tabley discussion clearly indicated that Holborne and Robinson used an octave cittern, or a small cittern for that matter. The Tabley ms. clearly associated the old-master cittern with the current one in name and number of courses, and probably in relative tuning of the courses. He only addressed size by mentioning that the early one was ‘little’. I cannot claim that it was more likely that ‘little’ was in comparison with the current cittern, rather than in comparison with other stringed instruments, and Peter cannot claim the reverse. The evidence here is ambiguous about sizes, pitches and octaves, and I was probably wrong in trying to demonstrate that a reasonable (but admittedly weak) case could be made in favour of the small cittern.
55. I think that Peter is getting silly here. I know of no early source where 'treble cittern' is used as the name of an instrument. This includes the Tabley ms. where the term only appears as a description explaining the size of an instrument which was clearly named 'Gittern'. Peter has been sloppily and annoyingly using the term as if it were an instrument species, and here even speculating on differences in size between the treble cittern and the gittern! By Talbot's time (c. 1694), the gittern had grown to be only a little smaller than the cittern, where it stayed during its 18th century transformation into the English guitar (which had a 43 cm string stop).

57 (labelled 1). Whatever one calls the instrumental combination of Morley's Consort Lessons, it must reflect the very unusual fact that all of the instruments were clearly specified with no alternatives mentioned. Of course there was much variation in the instruments actually involved in in playing Consorts, but we need to explain why Morley would be so uncommercial as not to encourage further sales with alternatives. The answer must come from his own attitude about the Consort's instrumentation, not an outside generalisation of what was happening in the field. That makes 'ideal' a much better description than 'crystallisation' or 'standardisation'. And there is nothing wrong with calling a common practice a deviation from an ideal if that is what it was. This does not imply that anyone worried about it being particularly inferior. Life has always involved guiltless practical compromises with ideals.

59 (labelled 3). The pitches of Praetorius's small English cittern were about an octave higher than Peter's 'usual' pitch, and they could only be achieved with what Peter calls 'orpharion wire'. Peter knows this evidence, and why he says he doesn't beats me. And all 9 strings had those pitches according to Praetorius's string gauge evidence, not the 8 Peter is throwing in.

510 (labelled 4). Praetorius's small English cittern was a cittern, was English, was smaller than any other cittern he knew of, and was fascinating. How else would Peter have him describe it?

511 (labelled 5). The printed Consort Lesson books specified the size names of each instrument involved even when, as was the case with the treble lute, there was no difference in pitch. Flutes that played with strings were usually at a lower pitch than those which played with other flutes in sets or in mixed wind ensembles. Only those in sets came in different sizes with different size names (Praetorius's instrument collection was very unusual in following the modern approach of insisting that all instruments conform to one pitch standard; evidence for this unusualness is in surviving inventories). If there was a choice of cittern sizes or octaves, that then would surely have been specified as well.

p.68 52 (labelled 6). When I played cittern at the Lute Society Summer School those many years ago, I had not yet refined my quill cutting technique. I also didn't play very well.

53 (labelled 7). The modern practice on all instrument is usually to play between about half volume to full volume. The 'softs' of early instrumentalists were softer than modern players would attempt. The early ones trained for playing to much smaller audiences, while modern players, even on early instruments, train for playing to bigger audiences. It is simply a matter of being prepared for the kinds of gigs one can expect to be asked to play for.

To Leycester (who wrote the Tabley ms.), the cittern had 'a Sweete and Gentle Sound', and justified its name, which in Greek meant 'a whisperinge Sound'. I am now of the opinion that all he knew about the early cittern of fashion was the two books he mentioned.

I use different quills for different balance in different Consort pieces, and I pluck in different places on the string in different sections of the same piece. This adds to the variety. The type of shimmer varies, but it is always there, and I don't notice any annoying scratchiness.

54 (labelled 8). Following Robinson, I teach my beginning lute and cittern students first to sing on the instrument by playing single line melodies. They do it from tablature, from mensural notation, and from their heads (picking out familiar melodies by ear). Next comes melodic and rhythmic embellishment. After that I teach them how to finger chords. If they
have previous experience in playing fretted instruments, grabbing chords cleanly is easier than playing single line melodies. If they do not have such experience, playing single line melodies is much easier. Most intermediate students can play 4 notes per second single line, which is all that is required by semiquavers (4 flags in tablature), the fastest notes in the lute part of Consort music at original pavin tempo. But this is all rather academic since the player of each instrument would have, at times, embellished his part as elaborately as his technique, ear, experience and imagination would allow.

§5 (labelled 9). Peter’s information on belly thicknesses is very useful whether or not it is relevant to the current discussion. Since he has not tested any cittern bellies to the point of collapse, there is little objective value in his judgments about what is needed to prevent such collapse. He is in very good company here; namely the many hundreds of today’s violin makers. They think that today’s violin string tensions are as much as violins can take, and can’t believe the historical evidence that violin string tensions were half again higher through the vast majority of the time of the instrument’s history, and twice as much as today in the second quarter of the 19th century. They also can’t imagine that Andrea Amati, who apparently invented the Cremonese violin design that is universally copied today, made his violins without a soundpost or bass bar, expecting them not to collapse. Today’s violin makers also never make the definitive experiment that would test their beliefs about belly strength, supporting their beliefs by evidence of small movements in the soundboard as a result of string tension.

Let us, for the moment, assume that Peter’s judgments about string tensions on citterns are historically right for most of the surviving citterns and copies if them. If so, they are appropriate for what these instruments most probably were originally made for, namely solo playing and vocal accompaniment. An instrument made for ensemble playing in difficult acoustic conditions, such as with a Consort playing to welcome honoured guests for a social event, could well have different stringing requirements.

All of the string tension evidence on citterns we have is from the wire gauges given by Praetorius (1619) for the small English cittern, and those given by Talbot (c.1694) for the larger cittern of his time. For Praetorius’s g”, d”, a’ or b”, and f” nominal pitches, the gauges are 11, 8, 5, and 10, apparently meaning diameters in mm of 0.189, 0.255, 0.342, and 0.208, with both steel and brass involved. For the tensile strength of the steel required not to be much greater than that of the steel used on the orpharion, the pitch standard was Praetorius’s preferred Chorthon (a’=383 Hz). At a string stop of 35cm, the tension of the first course was 5.0 Kg (the other courses are approximately the same). If the strings of the 2nd and 4th courses were exchanged for normal English cittern relative tuning and the first course was tuned to e” in Cammerthon (the usual Consort pitch when a recorder was used, a’=430 Hz), the tension would be 4.5 Kg, and in the preferred Chorthon (the usual Consort pitch when a treble viol and flute were used), the tension would be 3.6 Kg. I can’t see why Peter would find these tensions so outrageous.

For Talbot’s e’, d’, g, and b nominal pitches, the gauges are 1, 2, - (twisted), and 3, apparently meaning diameters in mm of 0.208, 0.230, -, and 0.255, with the first course of iron, the second of iron (Playford specified brass), the third course of twisted brass, and the fourth course of brass. The string stop was 47 cm and the pitch standard could be anywhere from what was then called ‘Consort pitch’ (a’=383 Hz, called ‘Old Consort Pitch’ in the 18th century), when the tension on a string of the first course would be 1.95 Kg, to a minor third higher (a’=456 Hz, called ‘Gamut proper’), when that tension would be 2.8 Kg. Peter could find these tensions a bit low. I doubt whether early cittern players were as fussy about their string tensions as Peter is, particularly since they apparently tuned up and down quite freely to meet the pitch requirements of voices and other instruments.

59 & p.69,51. The only disagreement I have with Donald here is the implication of what he wrote. The small English cittern could easily have been tuned with the top course to g’ or a’, and most probably was before and after Meuler’s wire was available. With Meuler’s wire
available, it could be tuned much higher. Just because the lower tuning was acceptable and enjoyed at times when Meuler's wire was not available does not in any way offer a reason why it should be preferred when that wire was available. There is no reason why the high tuning would not be equally as enjoyable or more so. I can't see how Donald's point makes logical sense. Historically, Praetorius said that it was tuned high, and this is confirmed by his stringing specification not including any twisted brass strings for the third course. One can only argue with historical evidence if there is other historical evidence that contradicts it. This, Donald has not offered.

The citrinchen stringing specification is a useful addition to our stringing knowledge. The gauges mentioned appear to correspond with diameters in mm of 0.230 (‘steel’), 0.281 and 0.342 (brass), and 0.378 and 0.461 (twisted brass). If the gauges refer to the five pitches and we consider one string of each course, the tension on the second course was one semitone step lower than on the first course, and that on the third is one step lower than on the second. We assume that the gauges pertaining to the twisted strings refer (as usual) to each strand of a twisted pair. We also know that the untwisted brass equivalent diameter of a twisted string is 6 steps thicker than the diameter of each strand. Then the tension on the twisted brass fourth course is three steps higher than on the first course, and that of the fifth course is a step lower than on the fourth. The jump in tension when getting to the twisted brass strings could be because they were single, like the two lowest of an English guitar, making it an 8-string instrument. Does this make sense Donald? But where does the word ‘octave’ in the specifications fit in?

53. The term ‘usual size’ is a statement of fact when referring to Europe as a whole in the 16th to 18th centuries. It is a statement of far from established fact when discussing England in the one to two decades on either side of 1600, where it is very misleading to those who do not already believe in Peter’s hypothesis. I have stopped using ‘large’ cittern and now use ‘larger’ in a clearly English context. Peter’s saying that my ‘large cittern’ was Leycester’s ‘the little instrument’ is also misleading since it reads like a new piece of relevant evidence, while it is only a restatement of his belief and adds nothing constructive to our debate.

54&5. Peter has made a considerable contribution to the history of instrument technology by clarifying how tail-end string fixings on citterns worked. But he should not be allowed to get away with the insult he gives here to the intelligence and training of early cittern players. Every instrumentalist has to learn how to prepare his/her strings for mounting onto his/her instrument. If a cittern string pair broke at the pin or rod in the tail end, and there was no double-length spare (or economy was important), he/she would surely know how to make loops at the broken ends that wouldn’t clamp and thus be trouble removing at the next breakage. He/she would also know to leave a quarter-inch of free end sticking out perpendicular to the string after twisting the loop, and then twisting the string (around its own axis) while mounting it on the instrument to spring that free end against the instrument so that it would not snag clothing or scratch skin. As Peter points out, orpharion and bandora players had no choice but to do these things - why expect less from cittern players?

§6 to p.70,§2. The hypothesis here is that whenever a cittern has three strings in a course, it either is three unison twisted strings or one twisted string and a pair of untwisted strings at the octave. The possibilities excluded are two twisted and one untwisted octave string, and (much more importantly) three untwisted strings. This would be an important stringing principle if true, but its truth needs to be tested by evidence alone, no matter how attractive an idea it seems to be.

Unfortunately, the only evidence supporting it is the stringing of the 16th century French cittern, where the third and fourth courses each had one twisted string and two octave strings. These two courses were tuned a tone apart and provided the highest and lowest string pitches on the instrument, expanding the open-string range from the usual sixth for citterns to a ninth. Much of the repertoire for this instrument was transcription of vocal polyphony, and the octave ambiguity in these courses was exploited by transcribing high and low parts on them. This stringing on this instrument served particular musical functions, and providing more shimmer
is unlikely to have been an important one of them.

All of the other evidence I am aware of is against the hypothesis by specifying tripled unison untwisted courses. Only one piece of clear contrary evidence should kill the hypothesis as a stringing principle, but Peter is a fellow who won't give up on any of his bright ideas without putting up a good fight for it, so I'll mention three. One is the Kargel and Lais book Peter discussed, excusing its non-conformity to his principle by that cittern being described as lute-like (I would think that lautengemasse meant lute-sized). A unison tripled course is not more lute-like than an octaved tripled course. Lute courses were generally doubled, not tripled, and octaved courses were very common on lutes then. My second example is Praetorius's stringing for the small English cittern. My third is Mersenne's first cittern illustration (the one with semi-diatomic fretting) where the first course is tripled. There are more. The principle is just a non-starter.

Peter is right to seek an explanation for triple courses. I think another one that Peter mentioned, that of not necessarily having to lose the service of a course if a string broke, is an exceedingly good one when coupled with the different properties of iron and brass. Brass continuously creeps under tension until it breaks. Iron creeps much less, and so breaks much less often. So tripled courses are an insurance policy against breakage of brass strings, and they should appear at least on the highest-pitched brass course, the one most prone to breaking. In the above Mersenne example, a tripling of the first course can be associated with the all-brass stringing Mersenne mentioned (the tripling of the 3rd and 4th courses could be to cater for conversion to iron and brass stringing if a higher pitch level is needed). Orpharion and bandora players get that insurance for brass strings by looping each string individually. Italian and other cittern players with doubled brass courses probably usually did the same.

54. Peter is wrong about the pitch standard of Praetorius's orpharion, and thus the strength of Meuler's wire. In his Chapter 30, Praetorius clearly stated that the orpharion first course was tuned to g' in Cammerthon. In his tunings table, supposed to be all in Cammerthon, there are two tunings: one with it at g' and another with it at a'. The a' alternative might possibly have only been for the preferred Chorthon (as I assumed when I wrote about the topic in Comm. 440), in which case Meuler's wire could go up to a semitone higher than gut. Praetorius's English cittern g'' requires it to go a semitone higher than this orpharion pitch, or two semitones higher than gut. But if Praetorius meant all tunings in the table were in Cammerthon when he said it, then a' at that standard was a possible tuning for his orpharion, and then the wire could go up to three semitones higher than gut. When Goodway and Odell tried to duplicate the phosphorus steel found in old harpsichord wires, they got that strength without trying to optimise it (the harpsichord wires didn't have that strength, but what they did with the same composition could well have had similarities with what Meuler did).

56. I would like to see the assumptions Peter makes in his argument about the Eglantine table cittern 4th course strings not being able to tune to English/Italian b. Why should it be desirable?

p.71.52. I don't understand why the Rose would have been first made as a 'treble bandora', whatever that is (it is not mentioned as a type of instrument in any source I know). Whether Meuler's wire was strong enough for it depends on what pitch it was tuned to, and we don't know that. Pitch standards were relevant then only when necessary, and they were not for solo playing or vocal accompaniment. Total open-string range is the only valid criterion, and 5- or 6-course bandora tuning does not fill the range like 7-course bandora tuning does.

55&7. Again, saying that an early source is wrong without producing contradictory evidence is just useless speculation. Octave strings on Robinson's cittern's third course would be higher than the first course. The first course could still be near to breaking if it was brass and the third octaves good iron or Meuler's wire. A brass first course could just be tuned to e' at Consort pitch (Praetorius's preferred Chorthon) with a 45 cm string stop, but the strings wouldn't last very long. Iron strings would last longer and would sound fine there, so they would be preferred. Thus Peter's hypothesis that Robinson's cittern had an octaved third
course depends on Robinson being in error about tuning the first course as high as it would go.

I know of no evidence that Leyseter's gittern had reentrant tuning. Playford's gittern print doesn't seem to have any indication of the octave of the 4th course relative to the others. The music itself would benefit from the fourth course being at the low octave. I think that there could be three reasons for having reentrant gittern tuning: one is for strumming, another is that a thicker fourth course string may be less available or more expensive than its usefulness can justify, and the third is for easy conversion to cittern tuning. The first and second apply to the ukulele, and the third to Praetorius's tuning for the small English cittern. I can't see how any apply to the gittern.

p.72. One can't discount evidence just because it is garbled and wrong. One needs contrary evidence, which could include that it doesn't make any internal sense. Robinson here makes perfect sense. Dirty hands gum up the strings and frets, and a dirty instrument adds danger of mishandling by others because of reduced respect. A nail on the right hand little finger scratches the soundboard, and nails on the left hand interfere with good fingering. Assuming that 'one sound' implies identical octaves while 'one tune' implies octave ambiguity is very far-fetched. It is vaguely possible, but can't be taken seriously unless there is supporting evidence of usage of these terms this way elsewhere. One also needs to provide motivation for Robinson to be so ambiguous and not declare outright that the course had a twisted low string and octaves.

Robinson was deliberately ambiguous about whether one played the cittern with a quill or with the fingers. The only possible reason for this that I have so far thought of is that he wanted to say that both were possible, but there was a vociferous lobby in at least one of the camps that insisted that that way was the only proper way. So he didn't discuss the issue at all to avoid making enemies. Could he have avoided mentioning a twisted brass string and octaves on the third course for similar reasons? Of course it is possible, but I can't think of a convincing reason. Somehow, I can't imagine people feeling that strongly about this issue.

93. We are now into finger stretches, and let us be quantitative about it. I can set up a conceptual cittern fingerboard with fifth-comma meantone fretting using the example given in Comm. 88 (with m=4). I then calculate the fraction of the string stop that a stretch between any two frets would represent. The largest stretch I have encountered in exploring the English solo repertoire was from fret tablature c to k. I have not made a systematic search of the repertoire for large stretches, and remember seeing this one once. It represents 0.296 of the string stop. More often, I've encountered stretches from d to l, which is 0.278 of the string stop, and from c to i which is 0.266. In the Consort repertoire, the longest stretch I've noticed is from h to f, where it was 0.194 or 19% of the string stop. On a 35 cm string stop cittern, in decreasing size order, these stretches in mm are 104, 97, 93 and 68. On a 45 cm cittern, these stretches in mm are 133, 125, 120 and 87. Thus if a 35 cm string-stop cittern (the size of the Praetorius one) is correct for the solo repertoire, and represents the widest stretches expected of the players, stretch problems do not rule out the use of a 45 cm string-stop cittern for the Consort repertoire. I must apologise if I have previously misled people on this point.

I asked a teacher of the modern classical guitar about how wide a stretch is expected of a guitarist. His response was a barre on the first fret and a little finger on the fourth fret. That is 98 mm, remarkably consistent with the maximum stretches required by the music on a 35 cm cittern.

I would be very surprised if Peter has evidence that Italian citterns smaller than the usual range of 44 to 46 cm were tuned to the same pitch as the usual ones. I would expect a wide range of pitches that citterns of the same size would have been tuned to. There must be a reason why Italian citterns with any number of courses confined their open-string range to an interval of a sixth. Pitch flexibility is the obviously probable reason. With iron on top and twisted brass on the bottom, the full possible range is represented by the pitch range of the 7-course bandora minus the effect of the angled frets. That range is an octave and a sixth, leaving a range of an octave of tuning flexibility for an Italian cittern of any size. The smaller cittern could have been
tuned to the same pitch as the larger one (or the really large one for that matter), but that is very
different from claiming that the pitches were the same.

4. The Italian Corista pitch standard seems to have been the same as Praetorius’s preferred
Chorthon, a bit more than a tone below modern. So a ‘Lauto Corista’ was probably the same
instrument as Praetorius’s ‘Chor-Laute’, and Praetorius’s name may well have been a
translation of this Italian name: Considering what I’ve written above, there is no stretch
problem with the Citara Tiorbata having a usual Italian cittern string stop.

The stringing of Robinson’s 14-course cittern is quite interesting. There was an octave and a
sixth of open-string range on the fingered untwisted strings, and a minor seventh range of
longer unfingered twisted strings. The range of fingered strings is what would be possible
with plain brass on the bottom and gut on top. This implies that the design assumed the use of
Meuler’s wire on top. The appearance of a chord of tablature frets c to i stretching 27% of the
string stop, which shouldn’t be more than 10 cm, implies a maximum string stop of 38 cm. I
see no reason to doubt this deduction. As for an instrument with lots of basses being small,
the tiorbino was achieving a degree of popularity in Italy, and it could have been what inspired
Robinson. Miniatures of instruments that are usually big are very attractive, especially to
people with the resources to be collector instruments. A major reason why Robinson’s 14-
course cittern never caught on could well be that large theorboed citterns were not used in
England. Also, Meuler’s wire wasn’t around for very long.

p.73. Yes, only the small cittern was expected in the 1585 to 1615 surviving repertoire, of
which the Holmes’ ms. is an example. The evidence for this, already mentioned, is that
Praetorius knew no other English cittern, and Morley and Rosseter’s printed Consort Lessons
mentioned the sizes of all instruments where that may have been ambiguous, and didn’t qualify
the ‘cittern’ specification. Holborne’s ‘admonition’ was only saying something like: ‘Those
of you who have experience with tablature for other fretted instruments might be surprised by
chords stretching over more frets than you have ever seen before; don’t worry about this since
all of these chords really do fit comfortably in the hand’.

3. There is one difference between the Robinson cittern and the current cittern implied by
Leycester’s description. It is that the current one had doubled courses throughout, while he
must have noticed that Robinson’s illustration shows a tripled third course. I don’t read this
quote as implying that Leycester was attempting to be comprehensive and this was the only
actual difference between them, as Peter does. I think that it is likely that Leycester had no idea
about the size of Robinson’s cittern, and that is why he didn’t discuss relative sizes.

4 & 5. Here, Peter reiterates his claim that the larger cittern with an octaved third course (with
Meuler’s wire for the octave strings) was used for the English repertoire in question. This
claim involves assuming that one of Robinson’s statements was in error. Since there is no
corroborating evidence for that statement to be in error, this claim cannot be taken seriously.
Peter also claims that the appearance of three strings in a course implies octave tuning. This is
not supported by the evidence, and so also cannot be taken seriously. As the situation stands at
present, my story about English citterns is the only one that fits all of the evidence, and it does
that rather well.

I am very grateful to Peter for putting so much effort into writing his Comm. 1445, trying so
imaginatively to square up his beliefs with the historical evidence. There are very few people
in the early music movement with such commitment to history as well as to their beliefs.

I would also like to thank him for the challenge offered by Comm. 1445. In the process of
formulating my response to it, I’ve learned a lot about citterns that I never knew before.
Thicknessing

In plate 13 of the Encyclopedie are shown two 'filieres'. The first, fig. 38, seems to be for the production of rectangular sections probably for purfling. The second, figs. 48 - 52, shows, complete in fig. 49 and disassembled in the other figures, what has been described as a tool for thicknessing veneer for purfling. The size of the vice in which it is held and also the size of the blade related to the handle, suggest that it was a quite sturdy tool and could also have been used for producing instrument sides and ribs. There is no indication of the material from which it was made but the illustrations seem to indicate that it was of metal with perhaps a hardwood insert for the pressure plate. I would suggest that the blade was toothed, and that its leg rested on the bench or floor for additional support.

Its use would probably have been a two man operation for larger pieces of wood. If the outer surface of the rib, etc. was prepared first, it would be protected from damage by the wooden insert while the waste was removed from the inner side during successive pulls.

I have not owned or made one, but would be very interested to hear from anyone who has or does. However I have made a plane which fulfils the same function, though more slowly than the machines which several people have built, but providing exercise and reliable results. The diagrams should be self-explanatory.

The toothed blade permits planing figured wood and against the grain. In my own plane the blade is held with a traditional wedge - there is no advantage in adjustment devices. It is set at 85°-90°. The 'floats' are held to the main body of the plane by coach bolts. A smooth accurate surface to work on is essential; I use a sheet of veneered plywood. To set the thickness the bolts are loosened and the required thickness set by spacers between the blade and the work surface. Good quality cardboard is surprisingly accurate. The outside surface of the rib, etc. is first planed and scraped. As with the filiere the waste is removed from the back. In practice it is necessary to alternate between planing to produce toothed lines and scraping to remove them. When the correct thickness is achieved the plane no longer cuts. Working at night with a side light helps to show up the lines, and care should be taken to remove dust from under the rib when the final thickness is neared. Accuracy to .05mm is easily achieved.

It may be possible and cheaper to purchase an old toothing plane and use the blade. Coarser blades remove wood more quickly. New 1/8" blades are obtainable from John Boddys, Riverside Sawmills, Boroughbridge, N Yorks. Y05 9LJ. Tel. 01423 322370.
I have recently finished the restoration of a 'Grecian' pedal harp c.1830 By Grosjean. The inscription engraved on the brass action plate reads:

_F. GROSJEAN AND CO. PATENTEES OF THE CRYSTALIZED SOUNDING BOARDS FOR ALL MUSICAL STRING INSTRUMENTS HARPS HARP GUITARS HARPSUPPORTS WERNELIN HARPS &c. No. 11 Soho Square London._

Unfortunately the soundboard that was on the instrument was at least the third one fitted to this instrument so there's no chance of any analysis. I am told that the 'crystalized' refers to the preparation of the varnish which might have included ground glass, rather than crystallizing anything in the wood itself. However A) harp soundboards of this type and period were usually painted not varnished. B) Literature shows that harp soundboards were heat treated.

Roslyn Rensch in her book _The Harp_ mentions that makers used to heat the wood (Swiss pine) to near boiling point several times. I don't have her book to hand to check the reference but my impression was that this was dry heat rather than stewing. Heating like this would crystalize/harden/cure?) resins etc in the timber, perhaps comparable to the passing of two or three hundred years.

If anyone has information about crystalized soundboards and this patent I would be interested. Grosjean was apprenticed to Erard and apparently only made harps for four years.
Wood structure and what happened in the Hunt & Balsan experiment

The *Nature* article by Hunt & Balsan (reprinted as Comm.1439) presents the results of an experiment where subsonic vibration (at 10 Hz) of a strip of spruce at the quite high humidity of 90% raises the natural vibration frequency by 0.3% and decreases the damping coefficient (a measure of the vibration energy absorbed by the wood) by 5%. These effects developed gradually, over a period of two days. When the vibration was stopped, the change was apparently permanent. This shift of properties was not observed at the more normal relative humidity of 44%. Before trying to understand what was happening in their experiment, let us first review the chemical and physical structures of wood cells.

The Structure of Wood

In dry weight, 99% of wood is composed of three types of chemicals: cellulose (about half), hemicellulose and lignin (about a quarter each). There is a 'middle' layer that glues adjacent cell walls together, which is made up of 3/4 lignin and 1/4 hemicellulose (and no cellulose). Adjacent to the 'middle' layer are the cell walls on each side. Each cell wall is composed of four layers, and as one considers them in sequence from the 'middle' layer to the interior of the cell, the lignin content decreases and the cellulose content increases, without the hemicellulose content changing very much. The four layers are characterised by having very different angles at which the cellulose molecules, tightly organised into microfibrils, spiral around the cell wall. Most of the strength and stiffness of wood is due to the cellulose microfibrils. The cells are very elongated with points at their ends, so if the cell wall thickened or thinned, the change would primarily be in directions perpendicular to that of the elongation. Air and water (liquid or vapour) gets from the interior of one cell to that of adjacent cells through rows of holes (called pits or pores) in their cell walls. Chains of such cells along the direction of elongation are the primary channels of transport between the interior and the surface of a piece of wood.

Cellulose and lignin are very stable materials and water can only attach to the surfaces of these molecules. That water is a very small fraction of the potential water content of cell walls. It is only the hemicellulose, which is a many-branched polymer (like a molecular bush), that can absorb large amounts of water and swell with it, thus swelling the cell wall and the whole piece of wood. A uniform swelling of each cell wall does not lead to uniform swelling of the wood in all directions perpendicular to that of elongation because the cell shape is rectangular, and in the longer direction, the cell wall thickness is a smaller fraction of the total cell width. From the point of view of the tree trunk, the expansion or contraction with increasing or decreasing moisture content is greatest in the tangential direction, about half of that in the radial direction, and about a hundredth of that along the tree axis direction (the cell elongation direction, also called the grain direction).

In an unconstrained piece of wood, the moisture content goes up or down according to how high or low the ambient relative humidity is. In stringed musical instruments, various parts with different directional dimensional responses to moisture content are glued together. The fact that these instruments don't fall apart whenever humidity changes indicates that when wood is dimensionally constrained, it will not respond to changes in relative humidity with changes in moisture content the way it does when not constrained. It will tend to keep the moisture content appropriate for the dimension it is constrained to have. We have every reason to expect that stressing a piece of wood by bending (either statically or in vibration) will also change the moisture content in equilibrium with a given relative humidity.

Increasing the moisture content of a piece of wood adds to its weight, and swells its volume, but relatively not as much, so the density increases. The velocity of sound in a piece of wood depends on the elastic modulus divided by density, so it decreases with increasing density, decreasing vibration frequencies. We would not expect moisture content to seriously effect the elastic modulus, which is primarily controlled by the microfibrils of cellulose.
Damping of free vibrations occurs when there is some mechanism of change within the vibrator that is capable of converting some of the energy of the vibration into that change. Thus if cell components within the vibrator are not in equilibrium, they may be able to steal energy from the vibration to change towards equilibrium faster. If the components are in equilibrium, the onset of vibration may shift the equilibrium, and the components use energy taken from the vibration to change towards the new equilibrium. Components may also take energy from the vibration to enhance vibrations of their own. If molecules jostle about during such enhanced vibration, the energy extracted from the original vibration continuously transforms into heat.

In normal conditions, the primary mechanism of change in wood is change in the amount of moisture absorbed by the hemicellulose. At least at high moisture contents, the primary mechanism for vibration damping is most probably jostling about of the water molecules amongst adsorption sites in the hemicellulose.

The Model of Hunt and Balsan

Hunt & Balsan assume that the total moisture content of the wood at 90% relative humidity stays constant during their experiment. As the consequence of vibration, water molecules slowly relocate from high-strain to lower energy sites. This relocation reduces damping and increases stiffness. When the vibration is turned off, the water remains indefinitely in the relocated sites.

There are several vital components missing in this model. One is to identify where in the wood structure these special sites might be. Another two are how does the relocated water manage to affect stiffness and damping. Another is to identify the nature of the moisture barrier that so effectively slows down the relocation during vibration and prevents return to equilibrium when vibration ends. I can't imagine what these components of their model might be. Without them the model is no more than a general speculation with no serious thought given to the specific known properties of wood as a material. Wood has never been shown to be any cleverer than to approach equilibrium with the moisture conditions around it as fast as moisture diffusion will allow. It would be preferable (though admittedly less exciting) if the results of this experiment were explained by a much more conventional model.

An Alternative Model

If we assume that bending strain during the vibration decreases the average moisture content of the wood in equilibrium with the 90% relative humidity, all is easily explained. The excess water was excreted from the cell walls into the cell interiors, from where in time, it diffused out of the wood. When the vibration was turned off, the wood can accept more moisture, but the diffusion back in was too slow to be measured. Let us put numbers to all of this:

According to the figures given in the paper, the vibration lowers the damping coefficient by 5%. Also mentioned is that the damping coefficient increases by 3.5% for every 1% increase in humidity. Combining these figures gives a lowering of the moisture content in the wood by vibration of 5+3.5=1.4%. According to standard tables of moisture content as a function of relative humidity and temperature (the authors do not mention what the temperature was, but I assume that it was less than 40° C.), the relative humidity in equilibrium with the reduced moisture content after the vibration stops was 87%, 3% lower than it was initially. Similar interpolation in standard tables of wood density as a function of moisture content and specific gravity (assumed to be 0.37 for spruce) makes a drop of 1.4% in moisture content lead to a drop of about 1% in the density of spruce. This would raise the vibration frequency by half a percent, close enough to explain the reported 0.3%, considering the accuracy of the figures used.

The report that this change was relatively permanent after the vibration stopped was due to the moisture going back into the wood rather more slowly than the moisture going out of the wood. There were different humidity gradients in the channels of moisture transport. The
gradient driving the moisture out of the wood during vibration would be 100% to 90%, and it took two days. When the vibration stopped, the gradient driving it back in would be 90% to 87%. The return rate, being about a third of the going-out rate, could easily have led to no observation of returned moisture in the one day given to that observation.

Comparison and Conclusion

When offering their model, Hunt and Balsan made no attempt to explain the mechanisms behind the novel properties of wood implied, nor did they make a quantitative theory to relate to their experimental data. In contrast, the alternative model includes only one slightly novel mechanism, and whatever can be deduced quantitatively from the model is consistent with the experimental observations. The two models can be distinguished by a simple experimental test: if one weighed the strip if spruce before and after the period of vibration, Hunt and Balsan’s model would predict no change, while the alternative model predicts a drop of about 1%.

The claim of the authors that the rise in frequency they observed was due to an increase in stiffness cannot be supported. They cannot distinguish between a rise in stiffness and a decrease in density, and the alternative model assumes the latter. Also, the claim that their observations are relevant to the playing-in of musical instruments cannot be taken seriously. The change in properties they observe on vibration is the same as would be observed if one lowered the relative humidity by 3% without vibration. Even if this happened over the full range of humidities, it would hardly be noticed by the musicians. The report of no significant changes observed at 44% relative humidity weakens their claim even further.

The title of the paper offers a solution to the well known problem of explaining sound improvement with age. This topic is never alluded to in the paper, which instead refers to the very different well-known topic of sound improvement by regular playing. The paper offers apparently competent experimental measurements that are not easy to make well. But it solves no problem and explains very little.

Models for sound improvement on playing in

I am aware of three explanations for this phenomenon that have been proposed. The one by Hunt and Balsan discussed above (shifting water in the wood) can not be taken seriously. Another explanation that has been offered is that there is no physical change in the instrument, but the apparent affect comes from the player learning how to get the best out of the instrument, and getting used to its sound. Preliminary tests with mechanical (non-human) vibration of the instrument and sound recording seem to show that the phenomenon is physically real. Another explanation was given by one of the original organisers of the Catgut Acoustical Society (I think it was Saunders). It was that weak glue is traditionally used to glue purfling into soundboards and soundboards onto ribs, and that during vibration, the glue breaks at points where the glue inhibits vibration amplitude the most, leaving the soundboard more free to vibrate. If the instrument is not played for a long time, the glue anneals together at periods of higher humidity, and the instrument needs to be played in again to sound at its best.

A new model proposed here is vibration acceleration of inelastic deformation, as discussed in the last two paragraphs of Comm.1416. When one initially strings up an instrument, it elastically deforms in response to the string tension. Then there usually is some inelastic creep as the instrument ‘settles in’ over a matter of weeks or months, until it becomes relatively stable. The creep can be speeded up by absorbing energy from sound vibrations during playing. An example of a similar effect, vibration acceleration of change of moisture content in response to a change in relative humidity, is given in the paper by Hunt & Balsan. The absorption of vibration energy was unusually high when the wood was responding to a change of relative humidity, and vibration speeded up the change in moisture content.
MAKING A SILK "SUNBURST" FOR A CABINET PIANO
or for other types of nineteenth-century Upright Piano.

INTRODUCTION

The "silking" of upright pianos was a separate trade in London in the nineteenth century. The commonest (and cheapest) procedure employed was to pleat vertically. The pleats (i.e. overlapping folds) would be approximately 0.5 inch apart, as in Plate I, or wider (say 1 inch) on larger instruments. However, if affordable, pleating in the form of a "sunburst" could not fail but to add extra elegance (see Plates II, III and IV). This design could be used on all upright pianos other than small cottage pianos, where a sunburst would appear to be too compressed vertically.

Sizes range, therefore, from

i) Upright Grands (8 feet 6 inches high, with either one or two doors – the total area of aperture being circa 54 by 36 inches (see Plate II), through

ii) Cabinet Pianos of just over 6 feet high, with the aperture circa 32 by 39 inches (see Plate III), right down to

iii) the taller models of Upright Pianos (about 57 inches high, with apertures circa 15 by 40 inches).

Sunbursts in oval shape can also occasionally be seen, for example on Southwell Upright Squares c.1800. Here the apertures are approximately 17 inches by 11 inches (see Plate IV). Two sunbursts on the same instrument would normally have their pleats folded in opposing directions for symmetry's sake.

In very basic terms, the making of a sunburst involves ironing creases in a length of material at regular distances, and then joining the two ends, making in effect a sort of "roller towel" of the old-fashioned type. Another way of visualising the procedure is to liken it to the process of making a pleated skirt (see fig. 1a). Having joined it up as shown, one edge is drawn up; this is equivalent to tightening the skirt to the diameter of a very small waist (see fig. 1b). The material is then pleated and stretched evenly over the wooden frame which fits into the piano front. Finally, the centre of the "sunburst" is completed by being covered by a rosette (see Plates III and VII).
Material.

In order that all this pleating does not muffle the sound of the instrument it is essential for a thin material to be employed, although it must not be so transparent that the frame be seen. The authors have found Indian silk to be the best material for this purpose, the traditional colours being red, green and gold. If it is decided that a backing material is visually necessary, then it must be fixed in place on the frame before the sunburst silking is applied.

Number of pleats and distance between them

In these descriptions, Imperial measurements have been used, to equate with those of the instruments themselves. The following instructions are applicable to an aperture of approximately 39 inches wide by 32 inches in height, on a circa 6-foot CABINET PIANO similar to that illustrated in Plate III. They can, however, be adapted to other shapes.

For this type of piano it has been found that a total of 108 pleats, set two inches apart, gives a satisfactory effect. This means that there are three pleats to every 10° of arc (i.e. 360 divided by 10 and multiplied by 3 = 108).

For this or different sizes of frame, other preferred numbers of pleats with different distances between them can be worked out on the same principle. But the essential feature to be borne in mind is that in the areas of the four corners (i.e. where the longest pieces of material - as measured from the centre - will be needed) there must still be sufficient silk for the segments to be satisfactorily pleated. As a further, but very different, example: for the two small oval sunbursts in the Southwell Upright Square piano illustrated in Plate IV, a total of 72 pleats set 1 inch apart were used.

Width and Length of material needed for a Cabinet Piano.

The width of material therefore must be sufficient to cover at least the distance from centre to corner plus 1 inch for a turn at the centre of the "burst" and, say, 2 inches for handling the material when it is tightened and pulled over the frame before tacking.

The net length needed will be 2 times 108 inches plus 0.75 inch either end for the join, i.e. 217.5 inches. However, be sure to allow a couple of inches or so more for safety's sake (as any stretching of the silk and the slight unavoidable errors when ironing can make a surprising accumulative change in the overall length).

(For smaller frame dimensions it is sometimes possible to get two half-sunbursts out of one width of material, so that only roughly half the total length of material above is needed; however, two joins will then have to be made. If this is attempted, it is recommended that two full-sized paper templates of each half be made, for then the relative positions of the two individual shapes can be juggled before
the material itself is cut. But this is a slow procedure, and if "time is money" it is cheaper to use straight runs of material. In any case an off-cut will be needed to create the rosette to be described later).

PROCEDURE

Preparing the material (fig. 2)

a) Turn down 1 inch on one of the long sides or selvedges. (This long side will eventually be drawn up forming the centre of the sunburst). There is no need to sew down this turning, merely pressing with an iron is enough.

b) Spread out the material on a table and mark accurately along the folded edge a distance of 0.75 inch (this is where the seam joining the two ends of the material will come).

c) From this seam point mark every 2 inches up to 216 inches, finally marking an extra 0.75 inch. Do this also along the other selvedge. Each mark should have a number (starting with 0 at the seam point and finishing with 108 at the other seam point), and it is advisable to ring every third mark, as these points will correspond with every 10° of arc. Leave any surplus material on for the time being.

Ironing and joining up (figs 1a and 3)

a) Iron the first crease where marked, i.e. 0.75 inch from the left edge of the material (this is for the eventual seam).

b) Throughout the total length of material, iron further creases every two inches as marked, all the creases facing in the same direction (fig. 3). With such long creases it is very difficult, but nevertheless essential, to keep the two-inch distance between them all the way. It is useful to cut a piece of card the same length as the width of the material and 2in wide (or rather slightly under 2in to allow for the thickness of card and material). This work must in no way be hurried if the final result is not to suffer.

c) Eventually when all the creases have been ironed, join the two ends of the material with the seam on the crease marked "0" being thus joined to the crease marked "108", with the turnings on the wrong side of the material, (i.e. the creases will be raised on the outer side of the material and the seam turning will normally be invisible as it will be on the inside). See fig. 3.

Marking points for threading (figs 4a and 4b)

For accuracy in marking the points where the two threaded needles will be inserted for drawing up the material, make a template from card 2in wide with four holes punched in the
correct places (refer to fig. 4a). A pencil or pen can then be inserted in each hole for marking the material (fig. 4b).

**Drawing up the "waist" of the material (fig. 5)**

It is essential to use very strong thread, as it is disastrous if it should break when eventually the whole sunburst is drawn up tight. But the thread must not be too thick or rough so that it snags the silk as you sew. A crochet cotton works well, for it is very strong, fine and smooth.

In drawing up the material, refer carefully to fig. 5 and Plate V. Use two separate lengths of thread, each of about 30 ins long, each bearing a needle. Start at different points in the cycle (so as to prevent one's having eventually two knots between the same two creases, thus making a bulge), drawing up the material periodically when the thread begins to run out. Stop when the "waist" is about 2 inches in diameter, and arrange it to be as even as possible.

**Making a template for positioning pleats on frame (figs 6a-b)**

Make a cardboard template, a quarter of the shape of the outer edge of the frame (see fig. 6a), and on this along the two outer edges at right angles to one another mark the points where the pleats will meet the frame's edge. This is best done by simple trigonometry, so have log tables or a scientific calculator at the ready.

Referring to fig. 6b: if x represents half the width of the frame, then the first distance y is found by $y = x \times \tan 3.33^\circ$, the second distance z by $z = x \times \tan 6.67^\circ$ and so on. Again mark every $10^\circ$ point more boldly with a circle to reduce the chance of eventually tacking a pleat in the wrong place. Starting at the bottom left corner of the template with mark 0 should result in mark 27's coinciding with the top right corner of the template.

For double assurance it is probably worth while also marking the edges of the frame in a similar way, although peering under the material is quite difficult - hence the use of the cardboard template.

**Setting up the frame (fig. 7)**

Take a cotton reel of approximately one inch in diameter. Cut off one flange. Fasten the reel (with its remaining flange facing upwards) to the centre of the frame by means of a nut and bolt (fig. 7). Firmly clamp the frame horizontally to a table or Workmate.

**Fastening the material to the frame (fig. 8 and Plate VI)**

a) Placing the partially-drawn-up "waist" around the cotton reel, draw up the threads reasonably tightly so that the material is butting against the cotton reel all round.
b) Tie the pairs of ends firmly together. (The knots will of course be covered eventually by a rosette or medallion). Distribute the creases fairly evenly, arranging their free ends so that there are roughly three every 10°.

(Note that the central vertically-aligned creases will turn gradually through 90° as they fan out to be pleated at the edges of the frame. This is the moment for deciding whether the pleats should proceed in a clockwise or anti-clockwise direction. The instructions in this article are designed for clockwise movement, but for a "matched pair" of sunbursts a "mirror image" effect is required, so the second sunburst should proceed anti-clockwise, with a reversed fig.6 template).

c) Place the fig. 6 template in position, and temporarily clamp one end of it to the frame at a corner.

d) It is at this point that an assistant becomes virtually essential. Starting at the centre of the left side of the frame, (position 0), align the "0" crease with the "0" centre mark of the template.

e) Refer to fig. 8. Stretch the material horizontally from the centre outwards, but be careful not to strain it. Adjust the amount of overlap of the pleat so that pleat no. 1 is in position under the mark "1" on the template (and level with the mark "1" on the side of the frame, if indeed the latter has been so marked).

f) Keeping the same tension on the material, turn it down over the edge of the frame, the assistant then fastening the pleat no. "0" (sic) with a tack into the edge of the frame.

It has been found that standard small tacks are rather wide in diameter in their shanks and there is danger of splitting the wood. The authors recommend therefore the use of small brass tacks 0.25 inch long, held in place during the process of tacking by a pair of miniature pliers. Plate VI shows the top centre of the two-door Upright Grand sunburst in Plate II at this stage of construction. The spacing between pleats in this particular area is greater than it would be at the side centre.

g) Keeping the tension firm, but not so tight that the frame shows signs of buckling, secure, say, the first six pleats (nos. 0 to 5), always arranging the position of "x+1" before tacking "x". Then fix six diametrically opposite (nos. 54 to 59) in order to equalise the tensions.

h) Secure six at right angles to these (nos. 27 to 32) followed by their opposites (nos. 81 to 86). Continue in this way until all pleats have been fixed.

i) Remove the cotton reel and make any final adjustments, such as inserting some extra tacks where necessary to tighten some pleats or make them more even.
j) Very carefully paint glue around the edge of the frame through the tacked material so that the latter will stick to the wood. Don't ruin your work by spilling glue on the sunburst! When the glue is thoroughly set, cut off the surplus material to make a neat edge.

CENTRE DECORATION

Centres of sunbursts have traditionally been covered (in effect masked) by

i) a rosette made out of the same material as the sunburst (i.e. so as to give the effect that the material has been gathered up and tied at its centre), or

ii) a small button and ruche rosette from which emerge two tassels on strings of slightly different lengths, (obtainable from the Nottingham Braid Company of Derby, if found too difficult to make), or

iii) a brass "star" medallion, (which can be obtained from specialist brasswork manufacturers, e.g. Optimum Brass of Bampton, Devon).

Making a Rosette as in i) above (Plate VII and figs 9a to 9d)

The rosette is, of course, made separately from the sunburst.

a) Take a spare piece of the same material that was used to make the sunburst. Cut it to 65 inches by just over 3 inches.

b) Fold it parallel to the long side and gather through both thicknesses about 0.5 inch from the edge (fig. 9a). Draw up the thread and fasten, then adjust the coil of the rosette until it has been evened out.

c) Cut out a circular piece of stiff, thick material (something like buckram) approximately 2 inches in diameter. To its centre firmly sew the centre of a tape approximately 9 inches long and 0.25 inch wide. (fig. 9b).

d) Fasten the rosette to the other side of the buckram, stitching all round the circumference to make it firm (fig. 9c).

e) Finally, pass the two tapes through the hole in the frame and tightly fasten them symmetrically to the back of the frame's central cross-member (fig. 9d).

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The authors are grateful to Alexander Mackenzie of Ord for reading this script and making valuable suggestions.
Plate I: Rolfe Cottage Piano, c. 1835
Plate II: Clementi Upright Grand, 1806
Plate III: Clementi Cabinet Piano, 1828

(Hobbs Keyboard Collection, Bristol, U.K.)
Plate IV:
Southwell
Upright
Square,
1799
(Mobbs)

Plate V:
Drawing
up the
"waist"

Plate VI:
Fastening
to the
frame

Plate VII:
Rosette
Fig. 1a

Fig. 1b

Fig. 2

Position of seam

Position of seam

(Surplus material)

(possible cutting point)

Self-edge

1" 2" 3" etc.

105 106 107 108

2" -> 2" -> 2" -> etc.

3/n 4/n 2" -> 4" -> etc.
Fig. 3

Fig. 4a

Fig. 4b

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Museums:

Claremont: Fiske (Al Rice).
London: Royal College of Music (Elizabeth Wells).