Quarterly No. 75, April 1994

FoMRHI Quarterly

ANNOUNCEMENTS

COMMUNICATIONS

ADDITIONAL COMMUNICATIONS IN QUARTERLY SUPPLEMENT (see Bull. Supp.)

FELLOWSHIP OF MAKERS AND RESEARCHERS OF HISTORICAL INSTRUMENTS
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FELLOWSHIP of MAKERS and RESEARCHERS of HISTORICAL INSTRUMENTS

Bulletin 75 **April, 1994**

I thought that the last Q was one of the best we've had for a long time - a lot of good material and well varied. Thanks to all of you who contributed - do please keep it up. Take advantage of the seasons, too; John Downing wrote that they were having a winter which is record-breaking in its severity, so he has had plenty of opportunity to catch up with his typing backlog - hence the number of Comms of his in this Q!

LOST MEMBER: Does anyone know where Jonathan Morgan has gone? He was in Teddington when he renewed his subscription, but he'd gone from there before the January Q came out.

FURTHER TO: Bull.74, p.4 - Electronic Mail: I am properly hooked up now and while I suspect there are a good many wrinkles I've not yet got the hang of or don't yet know the existence of (advice would be welcomed!), it is in daily use as jeremy.montagu@music.oxford.ac.uk (I gather it doesn't make any odds whether you use capitals, lower case, or a mixture). I'm still a bit reluctant to receive Comms of any great length this way, but only because everything takes time, which I seem to have less and less of. Certainly send things for the Bull this way if you can - for those it saves me time because I don't have to cut and paste.

Bull Supplement - Raudonikas: Eph has received one suggestion, which he and I agree is worth trying; I'll leave him to explain it. I only want to comment briefly on a letter that Felix sent me, in which he asserted that he had a right to be published in the Q. While Eph and I have every sympathy for the difficulties that he faces a) in getting highly technical material published anywhere, and b) in getting anything at all published in Russia, let us be quite clear on one point: Nobody has a right to be published. Despite what we've said recently about scrutinised or not, edited or not, Eph as editor has the usual wholly dictatorial right of decision whether to print or not. In this case his hesitations have been pragmatic and sensible - he decided that it wasn't right that one member should all-but monopolise a Q and, because of the length of his material keep other people out (there are limits to the size of Q that we can afford), and of course he was also influenced by its minority appeal. Let me add that, unlike other journals where such material would simply have been filed in the appropriate place without anyone ever hearing about it, you have all been consulted on this matter and you have all had the opportunity to respond.

Comm.1209:

Bill Waterhouse writes:
Whilst thanking Jeremy for his charitable review of The New Langwill Index (Comm. 1209), I'd like to answer some of the points he raises.

o The first thing to make clear is that my book is NOT an updated version of Lyndesay's old one. An exhaustive 'Methods and Principles' section, which sets out the newly adopted guidelines clearly, appears in the introductory matter (pp i-xxxvii) that forms an important supplement to the 518pp of main text.

o He finds an anomaly: "where I have the only, or nearly only, example of a trombone, sometimes it's noted as 'Jeremy Montagu collection', and sometimes as 'a trombone [or whatever] reported, and similarly of course for other people. I wonder why the difference?". On p xxxii I explain that listings under my 'Location' rubric are given only in the case of those makers whose working period is before 1850.

o '...the present bibliography isn't complete": Jeremy is worried at the absence of certain museum catalogues from the bibliography. The main bibliography lists solely those works that have been used in the entries; on p xxxiii I state that museum catalogues that do not contribute fresh biographical data are not acknowledged.

o The reason why his Romantic & Modern is listed in the bibliography, but not his Baroque & Classical, is because it is from the former book only that material has been cited (sv Bainbridge and T. Scott, where a point made by Jeremy, as far as I am aware for the first time, has been used).

o I make no apology for neglecting to include a list of every museum collection, every catalogue and checklist, every pertinent book; here was not the place to do this. As for wanting to include every instrument surviving in public and private hands... for obvious reasons I needed to limit my task to the realm of the attainable!

Comm.1212 – me blowing my top: I am interested that there has been no response to this at all!

THE LIST OF MEMBERS HEREWITH: Please note the back page – a reminder of format etc for your Comms. Especially please remember the matter of clear, black printing or typing; a clapped-out ribbon leads to illegible Comms (one of the minor things that makes it difficult to print Felix Raudonikas's Comms) and thus frustration for readers. Do please check your entry in the List and let me know if it's not OK. There are still a few German 4-figure codes – please let us have the new 5-figure ones. Let me know, too, if you're not there – I just found (my apologies to him) that Luis Gallardo never got in last year. M W Saaltink didn't get in either, but that was because Eph didn't get round to telling me that he (Eph) was paying (or rather not paying – he has now) his membership because he had a credit with NRI! Do use the List of Members – it takes quite a bit of work and I do it in the hope that it's useful. And do please look at it before you write to me to ask me where a certain member lives!

A WARNING: Charles Stroom writes (by e-mail): Some time ago I had an argument with Toon Moonen during the Recorder Workshop which was in Utrecht during the Festival voor Oude Muziek last August. He stated that, when measuring the bore of a conical bore with a fixed T-piece (i.e. by inserting a cross bar on a long arm), very large forces can be exercised and although I did not believe him at his word, after some calculations there is certainly some truth in his argument (it acts like a wedge in a very shallow cone). I would like to write that up in detail, but this has to wait. In the mean time, some warning should be issued to be careful when measuring using that method.

A NEW SOCIETY: The inaugural meeting of a **British Clavichord Society** will be held here, in the Bate Collection, on Sunday 19th June at 2.00 pm. Anybody interested in the clavichord is welcome, but please let Judith Wardman (26A Church Lane, London N8 7BU) know if you are thinking of coming – if you can't come but would be interested to know more about the Society, write to her (with an s.a.e). They are hoping to attract people interested in any aspect of the clavichord – making, playing, researching, or anything else, whether amateur or professional. There will certainly be some playing on June 19th, by Derek Adlam, Paul Simmonds and others,

including, I hope, on some of our clavichords such as the Hieronymus Hass, as well as on modern instruments.

QUERIES: Dr David Fyfe of the University of Otago in New Zealand is researching into the interaction of saliva and oboe and bassoon reeds. He is also interested in bacteria etc resident in reeds and the possible problems and dangers of people sharing reeds (I remember some correspondence a good many years ago from Paul Hallperin on this). A third aspect is the effect of pollutants from the atmosphere or the ground persisting to the stage where they might affect the player, or toxic elements from substances used on the reeds, such as carborundum paper, poisoning players. He would be interested to be in touch with anyone who has worked on any such matters or who is interested in discussing them. His address is Department of Restorative Dentistry, School of Dentistry, University of Otago, POBox 647, Dunedin, New Zealand.

THINGS AVAILABLE: The Bate Collection has three new plans:
The unique surviving flute by Antoine Delerablé, 1-key boxwood, c.1725-30 – Delerablé was Naust's apprentice and successor and Thomas Lot's master. £10.
Thomas Lot, 1-key boxwood with ivory mounts, with 4 upper-body joints, £15.
F G A Kirst, also 1-key boxwood with ivory mounts, with 2 upper-body joints, £10.
As usual, these prices include surface postage, folded flat to A4 size.

A firm called Jean Pierre Delaruelle (BP 2, F-60590 Talmontiers, France) is producing parts for bows, including hair, shell, and bone, as well as the metal parts, and also parts for organs and harpsichords, clavichords, etc. They asked for our List of Members so as to circulate you, but I thought it better to tell you about them myself.

BITS ABOUT MEMBERS: Caryl and Stratton McAllister are both retired but still living in Wisconsin, with not much opportunity to play on early instruments in that area – sounds as though they'd be glad to hear of any visitors interested in the odd day's blowing or gambaing.

A new Russian member, Dmitry Badiarov in St Petersburg, is making bowed strings. He sent me a photograph of a nice looking viola d'amore he's finished, with various bits of violin in the bckground. Like everyone there, he is pretty isolated and would welcome contact with anybody else working on the same instruments. His address is in the List of Members herewith.

Brenda Neece wrote that the private iconography library of Uta and Rudolf Henning provides a valuable resource for students of musicology and art history. The Hennings have organised their picture catalogue by instrumental ensemble. For instance, working from specific to general, cellos are found under single bowed instruments, cellos; groups of bowed strings; ensembles of bowed and plucked strings; and groups including members of various instrument families. Within each category, the Hennnings have organised the pictures chronologically. If known, each source lists the artist, title, date, medium, location of the original, and references to other sources including reproductions. Each source is on a separate, removable sheet, which is easily removed for photocopying on the Hennings' own photocopy machine. The Hennings are extremely helpful and welcome serious students to use their library. The address is in the List of Members herewith.

ODDS & ENDS: Someone called Marco Piga has written to me to say that he has been experimenting with ceramic recorders (clay baked at 985° C) and has now developed a system which overcomes the various problems involved. He has made three trebles, copying one of Piguet's Stanesbys and Brüggen's Bressan, and a traverso after Hotteterre. He has sent me a photo of the Bressan in its case, which looks like any other recorder; although it's cork-lapped, which may

be a result of the hardness of the material, the copy is serious enough that it has single holes. He says the sound is excellent, as is the intonation, and an advantage is that the windway remains always the same, irrespective of humidity. He doesn't seem inclined to join us but would welcome being in touch with anyone interested. His address is 05026 Castel dell'Aquila TR, Italy.

John Catch has sent me a 24-page booklet that he has produced called *A Century of Curious Quotations*. An example: Pepys...mentions a party of musicians spending the entire evening trying to get their viols in tune...this ought to be held up as a shining example to some modern amateurs, for they did try.

COURSES ETC: A couple of Bate Weekends in the pipeline: November 5/6 is a **Renaissance Wind Band Weekend** with Eric Moulder. And November 26/27 is an **Alec Loretto Recorder Weekend** with Alan Davis to look after the playing side. Alec says: 'Previous Bate Weekends devoted to Recorder Making have, over a period of years, dealt with topics including drilling long holes and making reamers; making and fitting blocks; voicing, tuning and adjusting the recorder's timbre etc etc. The November 1994 Weekend is of a general nature - any topics connected with the business of making a recorder. Have ready your questions as well as your latest ideas on building. Those from previous courses who have made instruments or parts of instruments are encouraged to bring them along, as are those who have made any tool or gadgets to help in making recorders. And if any established instrument makers of recorders or other instruments happen to be in the vicinity, please feel free to contribute. You would all be welcome. It will be another enjoyable Weekend as long as you turn up and take part!' Cost of both Bate Weekends is still the same, even though people say we are too cheap and should put them up: £20 (£15 Friends of the Bate Collection and students). To book, send a cheque made out to The Bate Collection, or just turn up. Judging from past experience, you aren't likely to be interested in this term's Weekend, Playing the Gamelan, but if you are, it's May 21/22, cost the same, but for this one you must book in advance because the number of places in a gamelan is limited to the number of instruments.

See a separate couple of pages for the Galpin Society and Historic Brass Society joint Symposium in Edinburgh in June - the programme looks as though it's something not be missed, certainly if you have any interest in either brass or keyboard instruments; I've already booked for it (luckily this term I only give one lecture a week and so can skive off for a few days)!

The Museums and Galleries Commission are laying on a course on Musical Instrument Care, as an introduction to the conservation of both 'western classical and ethnographic instruments' (I don't think that they mean to exclude western folk or popular - just clumsy thought). The course will be led by Bob Barclay of the Canadian Conservation Institute, with unnamed specialist colleagues. 'The course is aimed at curators responsible for significant collections of musical instruments and conservators or restorers who have experience of work on such collections, either in the public or private sectors'. It will be held at the Horniman Museum in London, with accomodation provided in a central London hotel from 31 July to 6 August. The course fee is £200, including accomodation (which is in fact all-but free; the £200 isn't going to pay much over the costs of the course; they've priced it as low as this because they want people to stay for evening lectures and discussions, even if they already live in London). The official deadline for applications is May 1, but as the notice only arrived here on Friday (today is Monday 11th April), I have phoned them and Peter Winsor says, yes, they will be as elastic as they can be about application dates. But because places for this very important course are limited to about 20, there are limits to elasticity, so **don't delay**. If you're interested, phone for information and

an application form today; ring the MGC on 071-233 4200 and ask for Robyn Greenblatt or Peter Winsor.

There's an International Musicinstrumentmaker Seminar in Norway, 21-30 October; It's difficult to work out who is running it, and it seems to be mainly modern piano, but if you're interested get onto NMF, PB 1103 Jeløy, N-1510 Moss, Norway.

The next meeting of the ICTM Archæo-organology Group, which will be joint with the Music Iconography Group, will be at Bar-Ilan University just outside Tel Aviv in Israel, Dec 29 to Jan 3. The organiser is Prof.Joachim Braun, Music Dept, Bar-Ilan University, Ramat-Gan, Israel 52900.

West Dean College has a course on Early Music Performance (13-19 August), but they don't seem to be doing any of their short instrument-making courses nowadays. Their address is West Dean, Chichester, W Sussex PO18 0QZ.

Stimu are organising an International Early Double Reed Symposium in Utrecht, 26-29 August, covering repertoire, performnce practice, iconography, restoration, and making, with lectures, forums, masterclasses, etc; their address is Postbus 565, NL-3500 AN Utrecht, Netherlands.

The Festival of Musica Antica a Magnano is from 5 August to 3 September, with courses on early keyboards August 18-27, with a special workshop on early restoration and maintenance; their address is Via Roma 48, I-13050 Magnano (VC), Italy.

HELP WANTED: We have been sent a book by Rainer Weber on restoration (highly skilled but also highly controversial) for review. I'd love to review it myself but my German isn't up to it. Who has both good technical German and enough knowledge about restoration technology and the controversies around it and Weber's work to do it justice? If I don't hear from anyone before mid-June, I'll do the best I can.

CODA: That, I think, is about it, but as usual I'll hold this while I do the annual List of Members (I have; that's how I was able to tell you of the MGC course).

DEADLINE FOR NEXT Q: Friday July 1st, please.

Jeremy Montagu
Hon Sec FoMRHI

BULLETIN SUPPLEMENT Ephraim Segerman, Hon Ed FoMRHIQ

A member has suggested a way for Raudonikas's long articles to be published and be available to the interested few without incurring the extra printing and mailing costs of including them in our regular Q. That is to publish them as Additional Comms in a Quarterly Supplement available on request at a price to cover costs (not my labour in doing the photocopying etc. in producing it). The Additional Comms are listed on the Contents page of our regular Q. The current Quarterly Supplement of 56 pages will be available at a cost of £2.50 from Jeremy.

SYMPOSIUM ON MUSICAL INSTRUMENT HISTORY

The GALPIN SOCIETY, with the HISTORIC BRASS SOCIETY, is holding an international symposium at St Cecilia's Hall in Edinburgh on the four days 10-13 June 1994. The papers will be in two major subject areas: historic keyboard instruments and brass instrument related topics.

Taking part will be many of the foremost international performers and researchers in the two fields, including delegates from Austria, Belgium, Canada, Germany, Hungary, Italy, Japan, Netherlands, U.K. and the United States.

There will be over 30 speakers, some giving papers reporting on recent research, others making brief contributions to float ideas and generate useful discussion. The papers will be interspersed with demonstrations of interest including a recently-discovered Hughes system ophicleide and the only known original repertoire for the ballad horn. The symposium sessions will be chaired by Charles Mould, John Barnes, David Rycroft and Trevor Herbert.

There will be organised visits to The Russell Collection, St Cecilia's Hall, John Barnes's Collection, and the Edinburgh University Collection of Historic Musical Instruments at the Reid Concert Hall. Various related events will take place over the weekend:

Workshop on Performing Early Baroque Ensemble Music, with tuition by Jeremy West (cornett) and Susan Addison (trombone), organised by the Scottish Gabrieli Ensemble.

Recital by John Kitchen (harpsichord) at St Cecilia's Hall organised by the University of Edinburgh's Faculty of Music as part of a series to mark the centenary of the Faculty.

Alta Capella Weekend School: Les Haulz et les Bas of Basel individual musicians or groups can be offered professional lessons. Félix Stricker (slide trumpet, sackbut), Gesine Bänfer (cornett, shawm) and Ian Harrison (cornett, shawm) will give lessons in: Cornett, Shawm, Slide trumpet, Sackbut, Shawm band, Mixed renaissance wind ensemble. Under the auspices of the Early Music Forum of Scotland.

Masterclass in historical performance practice at the Reid Concert Hall, given by Crispian Steele-Perkins (trumpet) and Susan Addison (trombone), organised by the Edinburgh University Collection of Historic Musical Instruments.

Concert at St Cecilia's Hall organised by the University's Faculty of Music to mark the anniversaries of three instruments in the Collection of Historic Musical Instruments: the sackbut by Anton Schnitzer (1594) and a trumpet and trombone by Joseph Huschauer (1794) at St Cecilia's Hall given by Crispian Steele-Perkins (trumpet) and Susan Addison (trombone).

Symposium Supper with live musical entertainment by Les Haulz et les Bas (Basel).

The programme of papers will include:

Grant O'Brien, Edinburgh: Marco Jadra: a Venetian Harpsichord Builder ? John Koster, Vermillion, South Dakota: From Karest to Ruckers: the Development of the Flemish Style. Darryl Martin, Edinburgh: The Identification of the Talbot Manuscript Harpsichord Lance Whitehead, Edinburgh: The Three Unique Models of Hass Clavichords. John Barnes, Edinburgh: Boxwood Tongues and Leather Plectra in 18th-century English Harpsichords. John Koster, Vermillion, South Dakota: A Couchet Compromise ? Michael Cole, Cheltenham: The 'Twelve Apostles' ? John Cranmer, Northampton: The True Provenance of Edinburgh-labelled Pianos c.1780-1818 Michael Latcham, The Hague: The Pianos of Stein. David Law, Long Compton, Warwickshire and Beryl Kenyon de Pascual, Madrid: Another Early Iberian Piano. Kenneth

Mobbs, Bristol: Early Piano Design from the Performer's Aspect. Stewart Pollens, New York: Christoph Gottlieb Schröter: Inventor or Fraud ? Louise Bacon and Frances Palmer, London: Work in Progress on the Nondestructive Analysis of Brass Instruments in the Horniman Museum. Murray Campbell, Edinburgh and Jeremy West, London: Cornett Acoustics and Design Principles. Patsy Campbell, Edinburgh: Brass Musical Instruments in the 'Instrumentalischer Bettlemantel', a 17th century Musical Compendium. Arnold Myers and Raymond Parks, Edinburgh: How to Measure a Horn. Dietrich Hakelberg, Freiburg: Recent Archaeoorganological Finds of the Middle Ages and Early Modern Times in Germany: a Contribution to the History of the Aerophones ? Harold Griswold, Towson, Maryland: Some Clues Regarding the Bassoon Reeds and tone of Mozart's "Good Wood-Biter": Georg Wenzel Ritter (1748-1808). Raymond Parks, Edinburgh: The Tuohitorvi: Cornett Survival or Re-creation ? F.lix Stricker, Basel: The Slide Trumpet in the Alta Capella. John Webb, Wootton Bassett, Wiltshire: Mahillon's Interpretation of the Wagner Tuba. Jeremy West, London: Tackling Fiddle Music on the Cornett: Possibilities and Pitfalls. Robert Barclay, Ottawa: Towards the Revival of the Baroque Trumpet. Peter Downie, Belfast: Les Trompettes du Roy and French Baroque Trumpet Style. Keith McGowan, London: Maintaining a High Standard: the Performance Pitch of Italian Instrumental Music c. 1480-1610. Alexander McGrattan, Edinburgh: The Trumpet in Funeral Ceremonies in Scotland during the 17th Century. Frank Tomes, London and Arnold Myers, Edinburgh: British Designs for Conical-Bore Cornets Beryl Kenyon de Pascual, Madrid: The Ophicleide in Spain. Lee Longden, Manchester: The Brass Band Movement of Central Manchester. Timothy Roberts, London: Reconstructing Locke's Music for His Majestys Sagbutts and Cornetts. Crispian Steele-Perkins, Abinger Hammer, Surrey: Dart's Dated Drums Dropped: The Use of Drums in Purcell's Trumpet Music. Peter Symon, Birmingham: Sighting the Sackbut in 16th Century Scotland. John Webb, Wootton Bassett, Wiltshire: The Un-natural Trumpet: Development of the English 4-hole System.

FURTHER DETAILS:

Arnold Myers, Edinburgh University Collection of Historic Musical Instruments, Reid Concert Hall, Bristo Square, Edinburgh EH8 9AG. Telephone (home): 031 447 4791 (UK); +44 31 447 4791 (international) e-mail: A.MYERS@UK.AC.ED (JANET); A.MYERS@ED.AC.UK (INTERNET)

1993 ACQUISTIONS: KENNETH G. FISKE MUSEUM AT THE CLAREMONT COLLEGES

Musical instruments acquired by the Kenneth G. Fiske Museum of Musical Instrument of The Claremont Colleges in Claremont, California in 1993, according to Albert R. Rice, Curator, are as follows:

1993.1. Melodeon by William Hastings and Philbrook, Portland, Maine, circa 1855.
1993.2. Clarinet in B-flat by Nippon Kang. Seizo, Tokyo, circa 1965.
1993.3. Flute by Baxter-Northrup Co., Los Angeles, circa 1920.
1993.4. Horn in F by Richard Wunderlich, Chicago, IL, circa 1900.
1993.5. Horn in F of Czech origin, circa 1900.
1993.6. Square piano by Astor & Co., London, circa 1805. 5 ½ octaves, FF to c^4.
1993.7. Grand piano by Jean-Henri Pape, Paris, 1835-40. 6 3/4 octaves, CCC to g^4, downstriking action.
1993.8. Slide cornet by C. G. Conn, Elkhart, 1923.

<u>European woodwinds on loan from the collection of Joe Moir, Santa Monica Brass and Woodwind Repair</u>:

1993.9. 6-key boxwood flute by William Henry Potter, London, circa 1825, sold by Townsend, Manchester.
1993.10. 8-key rosewood flute by Henry Hill, London, 1829.
1993.11. Boehm-system flute by Djalma Julliot, La Couture-Boussey, circa 1905.
1993.12. Boehm-system flute by the Baxter-Northrup Co., Los Angeles, circa 1925.
1993.13. Upper joint of a clarinet designed by Thomas F. and Robert J. McIntyre, made by Thibouville Frères, Ivry-La-Bataille, circa 1965.
1993.14. 6-key boxwood clarinet in C by Joseph Baumann, Paris, circa 1800.
1993.15. 13-key boxwood clarinet in B-flat by Jean Baptiste Tabard, Lyon, circa 1825.
1993.16. 13-key boxwood clarinet in B-flat by Thomas Key, London, circa 1825.
1993.17. 13-key stained rosewood clarinet in B-flat by Theodore Berteling, New York, circa 1870.
1993.18. 15-key German system clarinet in B-flat by Franz Carl Kruspe, Erfurt, circa 1880.
1993.19. Albert-system clarinet in B-flat by Eugène Albert, Brussels, circa 1860.
1993.20. Albert-system clarinet in A by Eugène Albert, Brussels, circa 1860.
1993.21. Albert-system clarinet in B-flat by Joseph Eugène Albert, Brussels, circa 1900.
1993.22. Albert-system rosewood clarinet in E-flat by Jean Baptiste Albert, Brussels, circa 1890.
1993.23. Boehm-system "double wall" metal clarinet in B-flat by the Couesnon Co., Paris, 1928.

♫ Nicholas Von Robison ♫
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March 17, 1994

Dear Friends,

We would appreciate it if you would include the following announcement in the issue of your publication you print closest to (but before) September:

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The CompuServe Information Service will offer a month-long focus on making musical instruments this September and we invite anyone who is interested in music to join us. Exchange messages with instrument builders from around the world, participate in real-time conferences, download files from the library, and view images of musical instruments built by other participants. CompuServe is a telecommunications service (computer bulletin board system) that you access with your computer and modem. The September activities will be held in the Focus section (13) of the CRAFTS forum (GO CRAFTS) but be sure to drop into the woodworking section (11) to say hello and join the fun. For an introductory sign-up package with one month free basic services and a $15 usage credit, call 1-800-848-8199 and ask for rep. 304.

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We would also like to solicit any articles of a general nature you might wish to contribute to the Crafts Forum library for this focus. Other publications that have helped build up our library include American Woodworker, American Lutherie, Guitarmaker, and Experimental Musical Instruments. Our guest authors include Dick Boak and Scott Landis, among many others. Please note that uploading a file to our library legally constitutes publishing, so if you do not hold the copyright to the material we cannot use it. Articles must be submitted on diskette, in ASCII or WordPerfect format, any size or density diskette OK. We can include all subscription information with the article(s) , which you must also supply. Please note that we cannot include the subscription price.

Thank you very much. If you have any questions, please contact either of us by letter, phone, or e-mail.

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FoMRHI Comm. 1238 **Jeremy Montagu**

Review of: **Edinburgh University Collection of Historic Musical Instruments, *Catalogue, Vol 2;A;i: Peter Cooke, Wind Instruments of Regional Cultures Worldwide*,** Dec.1993. £4 in UK, £5 abroad, including postage. EUCHMI, Reid Concert Hall, Bristo Square, Edinburgh EH8 9AG. Also available on 3½" disk for DOS, ASCII or Wordperfect 5.1, same prices but plus VAT in Europe, or ASCII only via e-mail through Janet or Internet (A.Myers@ed.ac.uk).

This fascicle is particularly welcome because it includes a number of instruments which are of some considerable age, as regional instruments go in museum collections, and which have not been documented since the 1872 South Kensington Exhibition. There are also several instruments which appear in Hipkins & Gibb wonderful picture book, *Musical Instruments, Historic, Rare and Unique*. Note, if you only have ac ess to the 1945 reprint of this work, that the plate numbers differ by one or two. It is also very welcome for two personal reasons: one that it uses for pitch measurement the Ellis, which Robert Stuckey introduced at the still-unpublished Belfast Ellis Centenary Conference and which, so far as I know, has only previously been used in my Bate Collection Gamelan Handbook; the other because Arnold Myers has followed my suggestion and used Regional instead of the pejoratve Ethnic.

The advantage of the Ellis is that it uses cents figures to indicate pitch (rather than interval as they are normally used), which provides an instantly recognisable culture-free reference. If you want to relate it to British Standard pitch, you can easily do so, but you can equally easily relate it to any other standard with which you are familiar.

Ethnic is a meaningless term in this context, for we are just as ethnic as anyone else, and when applied to objects (or food) it usually means either tatty or fake, or more often both. Equally meaningless is the term 'Western' for music or instruments; in what way is the Tokyo Philharmonic more (or less) western than the London, Vienna, or New York Phil? So bravo for Regional.

This fascicle uses also the Hornbostel-Sachs classifiation system, but does so only with verbal description; I agree with Peter Cooke that the numbers alone are singularly unmemorable (that was a main reason for John Burton's and my nominal system published in *Ethnomusicology* XV:1, which unfortunately did not work), but to my mind it is essential to have the numbers as well as a verbal listing.

The collection is a wide-ranging one and includes, on loan, Peter Cooke's own material from Uganda. Descriptions are normally brief but normally adequate, though I would much like to know how the external duct of the nose flute 3196 is constructed – I've never heard of an external duct nose flute before, and even internal duct nasally-blown flutes are pretty rare. There are a few slips (eg both 3278 and 3279 are described as the largest of a set of three panpipes; it is clear from the description that 3278 is the medium size), and there is an errata slip included. If the Burmese hnè is still as it was illustrated in Hipkins and Gibb, it is missing its metal bell, and I would expect its reeds to be multiplex (the hnè reeds are normally three layers of palm leaf on each side). There are one or two terms that I would query. For example, a number of duct flutes are said to have a notch; the common term (which is used here only ono ne of the duct flutes) is window, though Laurence Picken, in his magisterial *Folk Musical Instruments of Turkey*, established a wholly satisfactory complete vocabulary for all the parts of a duct, settling on mouth for this part. Whatever one decides, 'notch' is wrong because it implies something open at the top. Even odder is the use of the same word in connexion with the puutoorino 383. I have a personal aversion to 'cylindrical wooden pipe widening to...' One knows what is meant; nevertheless a cylindrical pipe is presumably a cylinder, whereas, if it widens, it is presumably conoidal. It is also useful, and not normally difficult, to give the species of a conch, especially when, as with both of those here, it is unlocated; Peter Dance, who identified many conches for me many years

ago, when he was at the British Museum of Natural History, has produced an excellent handbook for Dorling Kindersley.

The only two serious points are the mislisting (or misnaming) of the Dalmatian diple, which is listed under the heading of multiple conical-bore double-reed instruments; if it is a diple it is cylinder-bore and has single-reeds (as indeed the description says it has); if it's conical-bore and double-reed, it isn't a diple. The other is the frequent reference to Hipkins, 1885, which is not in the bibliography, and all the more annoying in that I don't know the reference, and would like to.

As I said at the beginning, this is, like all those so far produced for this Collection, an excellent catalogue and warmly to be welcomed. I would not wish the minor critical comments I make here, and made in the previous Q, to disguise their excellence. The comments are made in the hope of making a good thing better.

FoMRHI Comm. 1239

Jeremy Montagu

Review of: **Karl Lenski & Karl Ventzke, *Das goldene Zeitalter der Flöte, Frankreich 1832-1932*, Hermann Moeck Verlag 4047; 270pp, illus, 1992. DM 198.**

This is a very handsome production: large format, the same width as A4 paper but about 5cm higher, which makes shelving difficult; well-illustrated with many excellent photos of flute players, flutes and many details of keywork, embouchures, and makers' marks.

After a short history of Boehm's developments and their reception in France there are articles on the most important French flute players and teachers, from Tulou to Gaubert. These are followed by a section on Debussy, and this by a section on the main French flute makers, principally, of course, Louis Lot who is referred to (an odious but all-too frequent sobriquet) as 'the Stradivarius of flute-making'. How, I wonder, would the violin world like references to Strad as the Louis Lot of violin-making? Such comparative terms are only necessary on the assumption that nobody has ever heard of Lot, so that his position needs to be explained, and this of course is patently untrue. After an attempt to analyse just why the Lot flutes were the best, there is a section on the history of European pitch in the 19th century and Boehm's fingering schema of 1867.

Next comes what is headed as an Atlas of the French Boehm Flute but which is pictures and descriptions of a few instruments by Godfroy (7 flutes), Laurent (a single glass conical Boehm in the Dayton Miller Collection), Buthod & Thibouville and Buffet-Crampon (one by each), Lot (15 flutes), Bonneville (4 flutes), Julliot (2 flutes), Barbier (one), and Lebret (two). The majority of the instruments chosen are from anonymous private collections and thus inaccessible to anyone who wants any further details (which is why *The New Langwill*, for example, keeps references to private collections to a minimum).

Finally there are *mementi mori* to two eminent players of the recent past, Le Roy and Scheck, and interviews with three living players, Artaud, Graf, and Nicolet.

The extent to which this period and place can justifiably be referred to as 'The Golden Age of the Flute' could probably be debated, but certainly it is undeniable that had it not been for the nineteenth-century French makers and players, the Boehm flute might never have become established as the standard instrument. If you are involved with the flute, especially with the tin flute (as the wooden-flute players of my early days in the orchestras in the 50s and early 60s used to call it scornfully - it was only beginning to come in then with Geoffrey Gilbert and his pupils), and you have a spare £70 or so, this would be a nice book to have. It won't give you much new information, but then the history of the Boehm flute in France is already well known. There is a fair number of details which are less familiar, a number of things which are brought together in the one place, and there are all the pictures.

FoMRHI Comm. 1240 **Jeremy Montagu**

Review of: **Nelly van Ree Bernard, *The Keyed Monochord; rediscovery of a forgotten insrtument*, 48 pp, illus, 1993. Dfl.35 plus postage Dfl 7.50 Europe, D fl 10 overseas, Muziekcentrum 'Het Duintje', NL-2121 GX Bennebroek, Netherlands. Also a CD, Dfl 30 plus p&p**

I found this rather an odd book, partly perhaps because I'd not forgotten the keyed monochord which, in my *World of Medieval & Renaissance Musical Instruments* I illustrated and suggested as the origin of the clavichord. There is also a remark that 'the monochord survived long after the Middle Ages' as though this were surprising. Unless we could afford a Stroboconn (and how many of us could?) what else did we use for all pitch measuring purposes and as a tuning aid before the Japanese electronic boxes became available? I built monochords accurate to 1 cent in the early 1960s, and from time to time I still use my own one. There is also some confusion here between the string drum and the monochord.

Whereas the two mediæval illustrations she reproduces cover a range of three octaves, fully chromatic, Nelly van Ree Bernard decided to try to create an instrument covering a twelfth with b♭ as the only chromatic note; this does, of course, avoid the extreme cranking of keys shown in the original illustrations. Because of its musical potential she added a second course which could be used as finger-plucked bourdon. The resulting instrument was built for her by Koen Vermeij and a working drawing seems to be available for anyone else who wishes to make one, but it's not clear how much this costs or whence one can order it; try Nelly van Ree Bernard herself at Binnenweg 6, F 209, NL-2121 GX Bennebroek.

The second half of the book consists of modern (presumably her own) transcriptions of a number of medieval melodies, with no musicological apparatus, which are the basis of the music she performs on the CD, 'the basis' because she also improvises. These, pleasant as they are, have nothing to do with the mediæval keyed monochord, particularly since all use the plucked bourdon for which, as she says, there is no historical justification.

As an excursus into a newly-invented pseudo-mediæval instrument, with an equally invented repertoire, the CD is pleasant enough and the book interesting as an accompaniment to it. As a description of an hypothetical proto-clavichord, it seems too far from what evidence we have to be useful, even though the instrument described is more likely to be functional than either of those mediæval examples illustrated here.

Jeremy Montagu

Review of: Sebastian Virdung, *Musica Getutscht*, translated & edited by Beth Bullard; Cambridge University Press, 1993. 275 pp. £45 ($69.95).

Of the 275 pages, 93 are translator's introduction, another 93 critical apparatus and notes, and 89 Virdung. Anyone who finds Virdung's early German as difficult as I do will be grateful to Beth Bullard for this translation. When, as she often does, she also finds it difficult or obscure, she gives the original word in parentheses, as well as inserting probable expansions of the text in square brackets. She does, from time to time, reveal what seem to be gaps in general organological knowledge, for example saying that clavichords can have 'hanging pedals' added to them, which would seem to me to be what are normally called pull-downs; she adds no note or comment on this, any more than she does to the statement that clavichords are normally triple strung ('three strings make up one choir'). Nor does she make any comment regarding Virdung's statement that clavichords have sympathetic strings ('Several empty choirs are also added which no strings touch at all ... Some think the empty choirs produce a good resonance on the instrument'), even though no surviving instruments have such 'empty choirs' or, for that matter, triple courses.

As a source of information on instruments, Virdung is not over-helpful; he tends to be summary, vague and confusing, and often dismissive; he doesn't think much of percussion instruments, nor of the folk instruments which he illustrates. Certainly he can't be compared with Schlick, but Schlick (who is available in an excellent parallel-text facsimile and translation at a very reasonable price), unfortunately is only concerned with organs. Virdung's main concern is to teach intabulation, seemingly on the assumption that if you can intabulate music for the instrument you'll be able to play it.

Nevertheless, what little information he provides is about all that we have for the majority of instruments between Tinctoris and Praetorius, and so we should be grateful to Dr Bullard and, even at this rather excessive price, to Cambridge for producing this translation.

FoMRHI Comm. 1242

Martha Novak Clinkscale

The *FoMRHI Quarterly* Review of *Makers of the Piano 1700–1820*: A Question of Interpretation or a Statement of Misunderstanding?

A friend recently forwarded to me a photocopy of Michael Cole's review of my book *Makers of the Piano 1700–1820* (Oxford and New York: Oxford University Press, 1993). I confess that it was difficult to reconcile the bias of the reviewer with the actual information in my book. Directly or obliquely, Mr. Cole has slurred all those connected with this book, including the copy-reader, the editors, and the publisher. In addition, he cast scorn on two highly regarded authors of important previous works: Rosamond E. M. Harding (long in her grave) and David Wainwright. Is it perhaps possible that I have merely misinterpreted his words and his motives? It seems that several members of FoMRHI also believe his essay to be—shall we say—less than cordial, and they have written to offer me their support. It is for them, as well as for my other friends who were so bluntly criticized, that I offer this response.

The first obligation of any writer—even a casual reviewer—is to acknowledge the vision and effort of a predecessor. We are nothing without those earlier contributions. To emphasize the positive aspects of someone else's work is not only courteous, it is safe. In most cases it is even easy to do, because the virtues in any serious contribution usually outnumber the faults. There is always room in this world for disagreement with another author's basic philosophy, his approach to it, and his method of communicating his ideas. But a wise critic, not wishing to be thought unfair or discourteous, proceeds cautiously in expressing his reservations. Unfortunately, a careless and uninformed reviewer can do a great deal of harm. He can also be caught in a web woven by his own intentions, good or bad. Mr. Cole fell into his own trap—that is, if his purpose was indeed as destructive as one might believe.

Mr. Cole's first and most virulent expression of outrage was prompted by my reference to the Schmidt fortepiano which Leopold Mozart gave as a wedding present to his daughter, Maria Anna (Nannerl). This is not exactly new information, and I am sorry that Mr. Cole suffered such distress upon learning of it. My principal source was Kurt Birsak's excellent *Salzburger Klaviere: Verzeichnis und Entwicklungsgeschichtliche Untersuchungen zu den Saitenklavieren im Salzburger Museum Carolino Augusteum* (Salzburg, 1988); this reference, I hasten to point out, is listed at the foot of my entry on Johann Evangelist Schmidt. My other references, consulted but not listed in the Schmidt footnote, were: (1) Georg Kinsky, 'Mozart-Instrumente', *Acta musicologica* (1940), 1–21; and (2) *Mozart: Briefe und Aufzeichnungen*, 7 vols. ed. Wilhelm A. Bauer and Otto Erich Deutsch, with Joseph Heinz Eibl (Kassel: Bärenreiter, 1962–1975); the latter is the definitive edition of the Mozart family letters. (Incidentally, can this be the 'nine volume edition of the Mozart correspondence' to which Mr. Cole alludes?)

In his rush to judgment, the reviewer proved that he had neither examined the sources of my biographical information nor closely read the Mozart family's letters, from which he quoted. His brief, selected passage was unfortunately taken out of context, and the information that he conveyed is therefore inaccurate. *FoMRHI Quarterly* readers may be interested in a short summary by way of correction to Mr. Cole's flawed account.

Johann Rochus Egedacher was Hoforgelmacher at the court of the Archbishop of Salzburg from

1747–1785. Although no keyboard instruments built by him have survived, it is clear from Leopold Mozart's comments in his letters that he held both instruments and their maker in low esteem. Although Mozart knew that Egedacher was incapable of building a satisfactory instrument, he did rely on the old man to tune his own clavichord and make minor repairs to it. It is possible that Egedacher examined Nannerl's new fortepiano. He was, after all, despite his provincial limitations, the only 'Orgelmacher' around. However, he was not able to repair the instrument, even if he could have found time to do it. It appears that he needed more help in his workshop. Leopold wrote Nannerl from Vienna on 8 April 1785, 'If I could have got hold of a good journeyman organ maker there, I would have written to Egedacher a long time ago'. The latter must have criticized the instrument's workmanship, and this had obviously incensed Leopold, who continued with comments on Nannerl's trouble with her new fortepiano. He emphasized that 'the flaw is not in the workmanship but in the wood (Egedacher is a silly old fool), and good old woods, like gold, do hold up. So that is the reason [for the problem]: the flaw [in the wood]'—not a lack of ability on the part of the skilled craftsman who made the fortepiano itself. Incidentally, 'der Egedacher' here and elsewhere in Leopold's letters is not a reference to an instrument, as Mr. Cole assumes, but to the man himself.

Finally, on 9 June 1785 Mozart exultantly copied out for Nannerl a letter he had received from Johann Evangelist Schmidt, who had written, 'Mademoiselle Raderin [Maria Anna (Nannerl) Rader, or Raderin, a friend of the Mozart family] has written to me that the fortepiano, [which was] purchased for your respected daughter, was really unplayable.... Now this does seem an exaggeration, for she should really have let me know immediately.... I always stand ready to attend to the instrument... therefore I shall have [it] brought back.' For a continuation of this fascinating and suspenseful story, as well as further information on the subject of Leopold Mozart and the fortepiano, I invite interested readers to watch for my forthcoming article, *Leopold Mozart and Johann Evangelist Schmidt* (or Schmid, as he signed himself in later years): *A Musical Alliance* (working title). Incidentally, as I accurately stated in my book, this soon-to-be Hoforgelmacher did indeed live in Stühlingen, not 'Struhlingen', before he moved to Salzburg early in 1786. There is no town of the latter name anywhere, it would seem.

Mr. Cole clearly accused me of relying principally on readily available literature. He used as examples individual entries from the *New Grove Dictionary of Music and Musicians* and other *secondary* publications, particularly Donald Boalch's *Makers of the Harpsichord and Clavichord*, which in its second edition (Oxford: Clarendon Press, 1974) has become indispensable. A quick glance at my footnote references will show that they are listed logically in alphabetical order. Boalch, for example, begins with a B and often comes first in its company; thus it may appear to assume an importance that it did not always have. Furthermore, including any published reference seems to be a privilege that Mr. Cole grants to other authors, like Boalch, but not to me. Has he never noticed that for many English makers, the best available and even, in some cases, the *only* sources of information are certain signed articles is the *New Grove*? Or perhaps Mr. Cole finds Stanley Sadie's estimable accomplishment not sufficiently obscure for serious mention in another 'academic' book. What about early lexicographers like Gerber and other writers on the piano like C. F. G. Thon? Surely Mr. Cole does not actually mean that one should ignore valuable older works like these, simply because they were *printed*. Many of the oldest books have been long out of print and are virtually unobtainable. As any scholar would understand, I spent hundreds of hours finding many of these old books.

As for the results of contemporary scholarship, should the meticulous work of Dieter Krickeberg, Hubert Henkel, Herbert Heyde, Eszter Fontana, John Henry van der Meer, Laurence Libin, and scores of other serious researchers, also be condemned to the scrap heap? Is Mr. Cole seriously suggesting that there are no worthy accounts which are not entirely based on first-hand archival research? That the only worthwhile account is the one found in a manuscript? Had he actually been able to check my references, most of which appeared originally in French, German, Italian, Spanish, Hungarian, Swedish, Czech, Russian, and Polish sources, he would have noted that they are hardly easy to come by, despite his glib statement to the contrary. In fact, even Helga Haupt's 'Wiener Instrumentenbauer von 1791 bis 1815', *Studien zur Musikwissenschaft* 24 (1960), 120–84, is not likely to be found in an ordinary city library, and Helmut Ottner's unofficial sequel, *Der Wiener Instrumentenbau 1815–1883* (Tutzing, 1977), is scarcely available at the corner W. H. Smith.

As the Bibliography of *Makers* explains, my own name appears in the tables of the text to indicate an on-site verification of an individual instrument. I examined several hundred of the roughly two thousand pianos described in the book. Furthermore, there are about a thousand different references listed in the bibliography and collections chapters or in the individual instrument reference lines of *Makers*. This compilation represents but a third of the number of books and articles which I consulted. Many, including diaries and accounts by later manufacturers, had to be omitted, mostly because they were either not pertinent to my time-frame limitations or not informative enough to warrant inclusion. In addition, I sent out nearly one thousand letters of inquiry and between two and four thousand data forms to collectors around the world. I tried to turn over every stone, even if it were not in my path.

This brings us, of course, to the Cole account of the Clinkscale Broadwood and Backers entries. As for the mixup in the true date of the invention of the English grand action, I admit to an unwillingness to enter into the fray by adding my own speculations to the many arguments that have already appeared in print. In a moment of inexcusable lexicographical cowardice, I allowed the available insufficient and conflicting accounts of this important event to congeal into something of a cold beef stew. The date 1776, which I gave for its invention in my Backers entry, came, via Boalch (2d ed., p. 7), from *Some Notes Made by J[ames] S[hudi] Broadwood, with Observations and Elucidations by H[enry] F[owler] Broadwood.* Boalch gives the date of its first printing as 1838; Wainwright on p. 335 of *Broadwood by Appointment* (London: Quiller Press, 1982) gives the publication date as 1862. Boalch also alerted his readers, as I did not, that James Shudi Broadwood, 'in the *Gentlemen's Magazine* (1812), dates it [the invention] 1772 and the grand pianoforte of this year by Backers (Edinburgh, University Collection) incorporates it.' Mr. Cole adds another date for the invention of the English grand action: 1767, which he tells us was given as Henry Fowler Broadwood's correction of a typographical error (1776) in *Some Notes.* Wainwright carefully gives the 1760s. Is it not well to remember that the principal character, John Broadwood himself, had no part in the memoirs? We are imprisoned by hearsay. Let others, skeptical and cynical, examine and clarify this—one hopes that they can. In the meantime, we can rely well enough on Wainwright's account (*Broadwood by Appointment,* pp. 41–43).

Still, my description of the Backers 1772 grand (*Makers,* p. 16) states that its action is not yet quite the same as the English grand action made famous and familiar by John Broadwood and Son. In point of fact, we may never know positively when the development of the English grand action was

completed. I suspect that 1776, one year before Robert Stodart registered his patent for it, may well mark John Broadwood's first venture into this genre; we all might have dismissed it too precipitously. I am wary by nature and skeptical by training; and thus cautious about events recalled after so long a time, no matter by whom, even members of the remarkable Broadwood family. It is interesting that the reviewer once again does not afford me the same courtesy that he does other writers. Could not I have read *Some Notes* and thus learned of the adjustment to that printed date by Henry Fowler Broadwood? Could my insertion of 1776 not also have been a typographical error for an intended 1767? or even 1772? Before we leave the Broadwood matter, might I explain that my use of *apprentice* in both the Backers and Broadwood entries deliberately complies with its very first definition in the *OED*: 'a learner of a craft'. A learner is simply that: one who studies something new in order to understand it. It hardly matters at what age he undertakes such a project, nor whether he signs on for room and board in the process. John Broadwood did not make grand pianos before the mid-1780s. No one has yet explained the reasons for this long delay between lessons and manufacture.

As a small note, I should like to add here my increasing convictions that the Dutch, or Netherlanders, who came to England just after the middle of the 18th century, were much more important in the development of both the square and the grand than has been so far observed in print. Besides Backers and his contribution, has no one yet noticed my identification (for the first time, it would seem) of Johannes Zumpe's occasional partner, the enigmatic Meyer, as none other than Meincke Meyer, one of the major Dutch piano makers? (See *Makers*, pp. 199 and 333, Zumpe nos. 28 and 32.) Be that as it may, we need more evidence to clarify the history of the English grand action. To pursue the Dutch connection may answer many more of our questions.

Mr. Cole does make one good suggestion: if Marius can have an entry in *Makers of the Piano*, Roger Plenius does deserve his place. Nevertheless, his unfavorable comparison of my *Makers* to Boalch's admirable and nearly definitive work amused me. I hope I shall be forgiven for asking which edition of Boalch he meant? The 1956 offering is very good and we all gratefully recognize its merits. It marked the worthy beginning of a work which, after reaching thoroughness in its second edition, will be superseded by Charles Mould's definitive third edition.

In summary, I regret that Michael Cole felt compelled to write disparagingly about *Makers of the Piano*. The data on which this book is based are both voluminous and complex; organizing all that information into a practical and useful book was not a simple matter. Mr. Cole is not the first person to mutter that my goals were 'impossible of achievement'. I heard such comments for years. *Makers of the Piano 1700–1820* is the result of more than six and one-half years of concentrated, painstaking, agonizing work. It may not meet the expectations of everyone (what does?), but I hope that it will be considered a significant achievement and a valuable start toward the long overdue recognition, identification, and discussion of the earliest makers and their pianos.

Martha Novak Clinkscale

FOMRHI Comm. 1243 Felix Haudonikas

Somewhat about understandings.

Saul, Saul, why persecutest thou me?

It is quite peculiar case when physical education serves like reason for theoretical-musical non-understanding. Nevertheless, being the ultimate selfexpression of recognizing intellect, argument "I do not understand" is absolutely non-refutable one. Simultaneously this argument is the most strong polemic mean, because it makes useless any further discussion. Moreover examples of Galilei, Desargues, Peano, evidence that, ceasing cognitive attempt, this argument does not cease to influence upon destiny of scholar, his life and creation. In my excuse I can only repeat Frescobaldi's words: "I understand myself and let those people understand me which can it." I know also few persons for which my articles prove to be more understandable than for Ephraim Segerman.

As for mechanistic physics and relativity, so already Popper completely true pointed out the possibility of fruitful elaboration of rejected theory. However "Pythagorean system" repeals nothing, because nobody can point out such thing as traditional theory i.e., doctrine, deduced its theorems from set (or sets) of original phenomena and fundamental propositions. It seems like that, changing physicist's career for musicologist's one, Ephraim was a little a hurry (and too confident). In reverse case He might notice that in discussions of common character for a long time and enough oft the opinion appears, according to which elementary theory, harmony, contrapunct, as a matter of fact compose wide collection of instructions (similarly cookery-book), where it is possible for almost any statement to select its reverse. In particulars up to now musicology does not possess of satisfactory general definitions of such syntactic fundamentals as "system of tones", "modality", "mode of system", "cadence". Meanwhile the well comprehended cadencing would save musicology from endless invention of "historical tunings", of which consideration, f.ex., required so great deal Ephraim's investigatory activity. Ephraim would obtain better reasons for musicologist's reputation, if He developed his experience of reflections about connection between scale's formalisms and regularities of musical form. Up to now his theoretical creation had rather tonomentric character.

It would be mistake to think that above mentioned persons are more talented than Ephraim (which, in my opinion, is one of the most clever FOMRHIQ's authors). Without doubts my "English" foredooms reader to excessive difficulties, but considerably higher quality of my Russian texts does not make reader's labour problemless. Unfortunately not every theoretical matter becomes clear after first reading and reader always choices between necessity of patient study and possibility to say: "I do not understand."

Thus collision has rather ethic than cognitive character and Ephraim as scientific (i.e., understanding) opponent would be more worthy fellow than Ephraim, used his social influence against possibility of my publications. In this connection it shall be useful to remind that in science (unlike parliament) majority decides nothing. As for further understanding, so Ephraim's abilities would be more complete, if to his physical education He added study of algebraic structures and combinatorical mathematics.

I am far from that thought that my works contain perfect and complete report of Pythagorean theory. All they form no more than something in rough, first touch on great entity, of which ultimate recognition requires (and deserves) hard labour of many competent scholars. It excludes any possibility of treatment without on-coming efforts of reader. However these unavoidable efforts may be rewarded by more profound conceiving of traditional lexicon and by mastery of new language of musical universe (as well as by probable and desirable participation in its elaboration). Such language shall be more effective and easy (in Einsteinian meaning) than traditional one, because it implies much more extensive factual manifold.

As member of this manifold musical instrument deserves special mention. Being device for soundproduction and for precise control of sound, it may become an object of physical investigation. However, unlike other sound's sources, musical instrument implicates syntax of musical form that leads organology out limits of physical competence and creates its fundamental dependence on general musical theory. Incompleteness of traditional theory generates insoluble organological problems. As one of relevant examples here may be mentioned impossibility of universal (i.e., including any exotic instrument) classification on scale's basis. This and similar essentially important problems become soluble only in four-dimensional system.

As member of FOMRHI and in complete correspondence with its rules I am convinced of my right to publish in our Quarterly any relevant matter, "whether someone agrees with it or not, and whether someone understands it or not." In spite of these beautiful words, possibility of my publication becomes questionable not for the first time. What causes this segregation? What should I do yet in order to use my legitimate chance? Who and why can manage my association with reader? And how may non-understanding be reason for such privilege?

St. Petersburg. 25.02.94

Terence Kew
Governor

FoMRHI Comm 1244 Ephraim Segerman

Unwelcome Honesty Doesn't Help - a Response to Comm 1216

I doubt very much whether anyone will argue with the ethics of honesty that Bob Barclay writes in Comm 1216. But carrying it out is another matter. We as specialists have a much more detailed view of what constitutes historical accuracy than the general public has. Barclay suggests that we try to educate the public on this matter. In my experience with this, only a small minority is interested in being educated this way, but the vast majority is not. That majority is mainly interested in the beauty of the music they hear, and only wants a general reassurance of its faithfulness to the intentions of the composer, so that it is properly respectable.

When offered education about details in historical accuracy, all that the majority would be interested in would be whether the deviations destroyed the historical 'validity' of the performance. But they 'know' that 'validity' is not affected since the 'experts' they read and hear in the media aren't complaining. These are the critics that do the reviews and broadcasts. If they are not musicologists themselves, they follow the lead of the musicologists on questions of historical accuracy.

Consequently it is the musicologists, who are the opinion makers on music history for the general public, who need to be educated. But just try it, and you will find the same lack of interest as with the general public. And why should they be interested? They don't feel that it is their field. As music historians they are trained to the point of getting the historically correct sequence of notes on paper. It does not extend to historically correct sounds. The instruments used by the early music movement were developed by a close cooperation between the players and instrument makers (and organologists), with practically no contribution by the musicologists. The performance style of converting notes on paper into sounds was also mostly developed by the players themselves, with very little research-based guidance by musicologists.

While research into instrument history is done by another group of scholars (organologists), there is no-one else to do research into performance practices. But performance practices is not an attractive research area, mainly because the evidence is fragmentary, scattered and difficult to understand, there is little prospect of finding sweeping generalities to simplify the situation, it is very difficult to be objective about it if one is immersed in modern performing traditions, and people are only interested if it is attractiveness-enhancing. So the field has hardly been researched.

The musicologists cannot be criticised for not making pronouncements about things they don't know about. They are given the position of being the experts by the media because they are good journalists as well as respected music historians. Even if they made it abundantly clear to the media people that they are only experts on some aspects of music history, it suits the media to ignore such details (avoiding situations where this can cause embarrassment). If we instrument specialists want to make an impact on the public, we also must offer the media our journalistic services, mostly giving them the slick superficiality they want, with only a few complaints. I couldn't.

The public is happy with early music as it is. So are the media and the musicologists. None of these groups would welcome a dissenting voice saying that parts aren't as historically accurate as it implies it is. They will just ignore and/or ridicule it until it goes away. They can claim their own kind of honesty by saying that early music is as historically accurate as it is 'important' to be. Once the situation is reduced to a matter of judgement rather than objective facts, a dissenting voice doesn't have a chance against the mob (the goal posts are infinitely mobile).

So what can we do about our honesty? It is needed for our own self respect. We tell the truth to the few who are interested and have an open mind. But there is no point in imposing it on those who do not welcome it, and so will not believe it. For these, avoid the issue. The more intelligent and knowledgeable they are, the more they will avoid it as well.

And a Response to Comm 1215

Bavington knows that he'll never convince the general public either to use a different meaning for the word 'authentic' or to abandon it. I would not buy a used car from a person who so confuses what <u>is</u> with what he feels <u>should be</u>.

 Arnold Myers

Are our instruments HISTORIC or HISTORICAL ?

Is there a subtle distinction that we can not just observe, but can actually turn to advantage ?

Having inherited the care of a collection of 'Historic Musical Instruments', I was early on led to investigate if they are indeed historic, merely historical, or just old. Consulting the best dictionaries and Fowler (1968), I found that one is encouraged to use the word 'historic' to describe that which is written about in history, and 'historical' to describe those things which pertain to the methods of history or derived from history. Fowler[1] has it that

> 'The DIFFERENTIATION between the two forms has reached the stage at which it may fairly be said that the use of one in a sense now generally expressed by the other is a definite backsliding. The ordinary adjective of *history* is *historical*; *historic* means memorable, or assured of a place in history ...'

Now of course, 'written about in history' does not require mention in the history books we were made to read at school: we would then only allow Drake's Drum, or Nero's fiddle, or whatever. In our case, it is the instruments written about in the histories of musical instruments which are historic, and these could include equally surviving instruments in museums and actual instruments described and depicted in old writings and paintings. Instruments are not historic solely by connection with the famous or infamous, but by their own contribution to the history of music. Indeed, a museum instrument has only to be mentioned in a published catalogue written with historical purpose to be a historic musical instrument.

At the risk of pedantry, I would like to suggest as a useful convention that a HISTORIC musical instrument is a real, old instrument from which we can learn some history, and that a HISTORICAL musical instrument is a copy or other creation deriving from historical study of one or more real, old instruments. Not only would such a convention be useful in describing, for example, the instruments used in performances, it would also be consistent with the name of FoMRHI, primarily a fellowship of makers of HISTORICAL instruments and with other familiar writings such as the 'Current Register of HISTORIC Instruments' in the Galpin Society Journal.

This distinction would be particularly useful to those of us dealing with instruments which have continued in use (a maker could specialise in modern flutes or in historical flutes), perhaps less so in referring to viols, harpsichords etc where only historical instruments are now made.

1. Fowler, H.W., 1968. *A Dictionary of Modern English Usage*, 2nd ed. revised by Sir Ernest Gowers. Oxford: Clarendon.

FoMRHI Comm. Arnold Myers

Association in Instrument Collections

No-one doubts the duty of a curator to preserve, and where appropriate to publish, all information obtainable relating to a museums object's associations. These may be the association of an object with an external entity such as a former owner or a musical grouping in which an instrument was used, or it may be an association with another museum object such as a case or an accessory.

It is equally important that the nature of the association be recorded, especially of items which function together musically. Thus the mouthpiece coming into a collection with a trumpet may be known to have been supplied with the trumpet when new, may be known to have been used by a former player with the trumpet, or may have been known to have been 'thrown in with' the trumpet when it was last sold. In many cases the curator does not know the nature of the association, but may have good reasons for making an informed guess; in these cases the guess can also valuable and should be recorded with some indication of its degree of uncertainty such 'possibly', 'probably', etc.

Users of collection catalogues rightly expect this information to be contained in the catalogue. It is not necessarily convenient, and may be impossible, for the layout of entries in a catalogue to reflect all the associations. For example, if a museum acquires the stock-in-trade of a music shop, it would be an entirely normal and competent editorial decision for the violins to be placed in the catalogue with the other violins of the collection, the pianos with other pianos, etc. rather than for all the stock-in-trade to occupy adjacent pages.

When we come to playing adjuncts, the editorial policy is not necessarily obvious. Some adjuncts are used by players with more than one instrument, and catalogue users may find it helpful to have them placed together in the catalogue so that they can make the kind of comparisons which players make when selecting their equipment. This consideration has to be taken into account when deciding a cataloguing policy for: -

Bows for stringed instruments (not usually associated by makers)

Beaters for percussion and plectra for stringed instruments (the degree of association varies)

Mouthpieces for brass instruments (often associated by makers but commonly dissociated by owners)

Crooks for bassoons, horns, etc., tuning bits (also commonly dissociated by owners)

Mutes (rarely supplied with or specifically designed for an instrument)

Strings, drumskins, reeds (so ephemeral that any longstanding association is a rare treasure)

For these, and no doubt for other categories, the editor of a catalogue must consider the size and scope of the collection and the needs of catalogue users. One cannot be dogmatic and say that one policy must apply to all catalogues, though users should always expect proper information about associations and editorial consistency.

In the case of the Catalogue of the Edinburgh University Collection I decided that it would be helpful to readers to place together entries for bows (especially as violin bows are used for violas), beaters (drum sticks could equally come into the Collection with cymbals, wood blocks, etc) and mouthpieces for brass instruments (especially as the brass instruments require several fascicles). I decided that it would be less useful to describe all bassoon crooks together as the balance of convenience, I believe, is in having each crook described with its associated bassoon: if not original, it is likely to have been found by some player to work with a particular instrument.

At the expense of some leafing to and fro between fascicles by users seeking information about the mouthpiece associated with a particular instrument, we will have the benefit of having mouthpieces that have come into the collection with tenor trombones and baritone saxhorns (the same shape and size often serves for both) described together, mouthpieces for bass trombones and ophicleides on adjacent pages (the comparison will be interesting) and the history of the changing shape of the trumpet mouthpiece usefully charted. I remain convinced that this is right for this Collection and for its catalogue readership.

FoMRHI Comm. 1247 Arnold Myers

Nominal Pitch

There can never be a completely uniform convention on nominal pitch, because for some instruments in some traditions it is used to describe the physical size of the instrument or the starting point of its basic scale, whereas for other instruments and in other traditions it relates more to the transpositions players customarily use.

Thus, a brass bandsman treats a 9ft tenor trombone as a transposing instrument, an orchestral player doesn't transpose, but both would regard it as being 'in B♭' without any doubt, neither 'in C'. On the other hand, the basic scale of the 1-key concert flute naturally prompts the description used in some contexts 'D flute' although the Boehm instrument in C is recognisably a development of the 1-key flute, without a drop in the basic scale of two semitones, and played with the same transposition (i.e. none).

It is customary in museum catalogues to regard the tenoroon as being in F or in G, depending on whether it plays a fourth or a fifth above the ordinary bassoon. This nomenclature does not depend on any transposition that tenoroon players may have used. Similar considerations apply to the semi-contra bassoon. If one accepts this long-standing convention, by implication the ordinary bassoon is 'in C' although the fingering most closely resembles other woodwinds 'in F' such as the cor anglais (which transposes) and the bass recorder (which doesn't). The connection between nominal pitch and the lowest note is particulary unreliable: many flutes, the basset horn, the full Boehm clarinet etc have extended compasses which do not upset the fingering of the basic scale.

For a museum catalogue there is no hope of an usage which will satisfy critics such as Jeremy (Comm 1211); the cataloguer can only state which conventions he has used and follow them consistently. The Methods of Cataloguing in Volume 1 of the Edinburgh University Collection catalogue state:

'NP Nominal pitch: applies to wind and percussion instruments 'in' a certain key. On brass instruments, this is generally the fundamental pitch of the tube without keys or valves being pressed or slides extended. On woodwinds other than bassoons, this is generally one tone lower than the 'six-finger' note in the lowest register for instruments overblowing at the octave, in the second register for instruments overblowing at the twelfth. For example, the instrument with traditional English nomenclature 'B♭ Piccolo' has the nominal pitch A♭. If in any special case there is good reason to depart from this convention, this departure should be stated in the catalogue entry and explained in the introduction. If instruments of the class exist in a very wide variety of sizes, a designation of the octave of the nominal pitch should be given, following the American Standard convention. For example, the descant recorder is 'in' C_5, indicating the note a tone lower than its lowest six-finger note. The designation of the nominal pitch of an instrument does not necessarily indicate the transposition used by its players: the differences between conventions for trombones, Wagner tubas, bass clarinets etc are well known.'

It is tempting to suggest TWO pitch designations for size, one related to the pitch of an acceptable reference point such as three-finger or six-finger note of a woodwind, or the fundamental of the harmonic series most closely matching the natural modes of vibration of a brass instrument with no movement of slide, keys or valves. Vance[1] has suggested the three terms 'transpositional key', 'intrinsic key' and 'fingering key', any two of which specify the pitch of the instrument. I have considered that this would only lead to confusion in the minds of occasional users of the catalogue, and that it is best to use the normal players' conventions with problem cases explained in some detail in the catalogue text.

An example of a special case is the Sax 6-valve independent system trombone equivalent to the 9ft B♭ tenor trombone in compass, tessitura and musical function. This sounds a series of notes closely approximating to the harmonic series of E_1 without any valves being pressed, but it makes much more sense to regard this instrument as 'in B♭' although the player has to use the first valve to obtain the B♭ series. This is a 'special case where there is good reason to depart from the convention'.

1. Stuart-Morgan Vance, 1972. What key is an instrument "in" ? *Newsletter of the American Musical Instrument Society* October 1972, **1** (4) pp.6-7.

FoMRHI Comm 1248

John Downing

Measuring Instrument Pitch with a Pocket Tuner

Concert pitch standards were subject to considerable variation throughout the 100 years or so preceding international agreement on A440 as standard in 1939. Seeking a convenient and inexpensive device for measurement of the pitch number of 19th C reed organs and brass instruments, the preferred option of "professional" pitch meters costing the best part of $1000 was rejected as too expensive. Our local music store, however, had a showcase full of battery powered pocket tuners designed for the tuning of electric guitars and other instruments. These compact little tuners appeared to be more or less of the same design with an analogue readout (Vu meter) indicating deviation in Cents from a standard pitch on an equal semitone scale. They retail here from about $40 to $180 dependant upon quality and the number of special features provided.
I was able to borrow a Seiko ST900, a chromatic tuner in the mid price range, and found that it could be readily adapted to measure instrument pitch with sufficient accuracy to suit my needs. This Comm. describes how this can be done for the benefit of those who might wish to use these tuners for pitch measurement purposes. No doubt similar results may be obtained by using other brands of tuners. I have undertaken all the necessary mundane arithmetical calculations required the results of which are tabulated for reference in tables 1-2.

Seiko ST900 Specification and Description

Display: Vu meter (± 50 Cents range)
Tuning Indicator (2 LED's - sharp and flat)
Tone/Pitch Indicators (8 LED's)
Measuring Range: C1 (32.7Hz) to B7 (3951.1 Hz)
Accuracy: ± 1 Cent
Calibration Frequencies:438Hz to 445Hz in 8 steps
Terminals: Input/Output jacks
9v DC jack
Built in microphone
Battery: 9v S-006P
Dimensions: 128x68x26 mm
Weight incl. Battery; 136 gm

The LED Tone/Pitch indicators are set in an array above the meter scale for ease of reference. The meter scale is marked in graduations of 10 Cents about a central scale zero point. The meter needle when unactivated rests on the minus 50 Cent position.

To use the meter for tuning, one of the calibration frequencies is selected (440Hz is the normal default frequency) and the tuner is held close to the sound source to be measured. The closest tone or semitone is indicated by the LED display, the deviation of the measured frequency from the calibrated tone frequency is indicated by the meter and the tuning indicator LED's light up to indicate ± deviation from the "in tune" position. The sound source is then adjusted in pitch until the required tone is indicated, the meter indicates zero position on the scale and both tuning indicator LED's light up simul--taneously.

Accuracy

According to the manufacturer, the tuner is able to measure pitch to within ± 1 Cent (i.e. one one hundredth part of an equal semitone)
When used as a tuner, however, the zero , "in tune" position is only accurate to within ± 3 Cents.
The Vu meter is clearly marked in 10 Cent intervals and the space between each marking is such that, given stable conditions and taking care with the reading of the meter, intermediate values might be estimated to within ± 1 Cent.Hence when using the meter for pitch frequency measurements it should be possible to measure to within ± 2 Cents or ± 0.5 Herz around A440. This is not quite good enough for say, precise tuning of keyboard instruments but is accurate enough for determining instrument pitch for comparative purposes.

As the meter is essentially a spring loaded needle, the needle deflection will be affected by gravitational forces if the meter is used in a vertical position. For the most accurate readings,therefore, the meter should be held in a horizontal position.

It should be noted that the tuner is designed to measure tone frequencies for an equal semitone scale covering an octave range C1 to C7. This particular meter, unlike some of the more expensive models, does not have a tone generat--ion facility so the octave in which the measured tone lies is not indicated. This is not important for measurement of instrument pitch number as the tuner reading is always given with reference to A4 frequency which is what is required for comparisons of instrument pitch. This, of course assumes that the instrument being measured is tuned in equal temperament - where this is not the case, then the measured value of A4 will require correction dependant upon the degree of tempering applicable so that like comparisons may be made.

Readings of pitch number should always be made with reference to room temper--ature at the time of measurement and the frequencies measured converted to a value at a common temperature such as 15°C/59°F or 20°C/68°F.

Example

Check the accuracy of the tuner using an electromagnetic buzzer operating on 60 cycle mains frequency, as a sound source.

With a tuner calibration frequency of 442Hz selected (for example), the meter reads;- A sharp plus 42 Cents.
From Table 1, column A422 - A sharp frequency is 468.28Hz.
From Table 2, a deviation of+42 Cents gives a frequency ratio of 1.02456.

Measured frequency at a tuner calibration frequency of 442Hz is, therefore:-
468.28 X 1.02456 or 479.78Hz.
Buzzer frequency is 120Hz which is equivalent to 480Hz transposed to A4 octave.
Therefore, the error in this reading is 480 - 479.78 or minus 0.22Hz.

Taking a reading at each of the tuner calibration frequencies and taking a mean value gives a measured frequency of 480.16 ± 0.47Hz i.e. if the mains frequency is precise then the tuner is reading 0.16Hz high (.03%) and the reading error is within ± 0.5Hz (0.10%).

Correction Factors

Temperature - in converting measured readings to frequencies at a standard temperature, the following factors may be applied:

Wind instruments including woodwind, brass and pipe organs:-

For each unit of vibration in Herz, and a temperature rise of 1°F, pitch will sharpen by a factor of 0.001.
So, for example, A435 at 59°F will measure 435.435Hz at 60°F, 435.87Hz at 61°F and so on.

Reed Organs :-

For each unit of vibration in Herz and a temperature rise of 1°F, pitch will flatten by a factor of 0.0001.

Tuning Forks :-

For each unit of vibration in Herz and a temperature rise of 1°F, pitch will flatten by a factor of 0.00005.

(Source - Helmholz 'Sensations of tone', Trans.notes)

Temperament - where the deviation from equal tempered scale in Cents is known the factors in Table 2 may be used to convert the frequency reading to a standard value at equal temperament.
For example, for a pipe organ tuned to a meantone scale, tuner reading of A4 at 59°F is 435.4Hz, equal temperament. The difference between A4 meantone and A4 equal temperament is minus 10 Cents. From Table 2 the frequency ratio for minus 10 Cents is 0.99424 and the converted value of frequency is 432.9Hz.

TABLE 1

C4 Octave Tone Frequencies for Seiko ST900 Tuner Calibration Frequencies

A438		A439		A440		A441	
C	520.86	C	522.06	C	523.25	C	524.44
B	491.62	B	492.76	B	493.88	B	495.01
A#	464.03	A#	465.10	A#	466.16	A#	467.22
A	438.00	A	439.00	A	440.00	A	441.00
G#	413.42	G#	414.36	G#	415.30	G#	416.25
G	390.21	G	391.10	G	392.00	G	392.89
F#	368.31	F#	369.15	F#	370.00	F#	370.84
F	347.64	F	348.43	F	349.23	F	350.02
E	328.13	E	328.88	E	329.63	E	330.38
D#	309.71	D#	310.42	D#	311.13	D#	311.83
D	292.33	D	293.00	D	293.67	D	294.33
C#	275.92	C#	276.55	C#	277.18	C#	277.81
C	260.44	C	261.03	C	261.63	C	262.22

A442		A443		A444		A445	
C	525.63	C	526.82	C	528.01	C	529.20
B	496.13	B	497.25	B	498.37	B	499.50
A#	468.28	A#	469.34	A#	470.40	A#	471.46
A	442.00	A	443.00	A	444.00	A	445.00
G#	417.19	G#	418.14	G#	419.08	G#	420.02
G	393.78	G	394.67	G	395.56	G	396.45
F#	371.68	F#	372.52	F#	373.36	F#	374.20
F	350.82	F	351.61	F	352.40	F	353.20
E	331.13	E	331.88	E	332.62	E	333.37
D#	312.54	D#	313.25	D#	313.96	D#	314.66
D	295.00	D	295.67	D	296.34	D	297.00
C#	278.44	C#	279.07	C#	279.70	C#	280.33
C	262.82	C	263.41	C	264.00	C	264.60

Frequency in Hertz

TABLE 2

Frequency Ratio for Deviation in Cents from Calibrated Tone Frequency

Cents +

0	1.00000	10	1.00579	20	1.01162	30	1.01748	40	1.02337
1	1.00058	11	1.00637	21	1.01220	31	1.01806	41	1.02396
2	1.00116	12	1.00695	22	1.01279	32	1.01865	42	1.02456
3	1.00174	13	1.00754	23	1.01338	33	1.01924	43	1.02515
4	1.00231	14	1.00812	24	1.01396	34	1.01983	44	1.02574
5	1.00289	15	1.00870	25	1.01454	35	1.02042	45	1.02633
6	1.00347	16	1.00928	26	1.01513	36	1.02101	46	1.02693
7	1.00405	17	1.01512	27	1.01571	37	1.02160	47	1.02752
8	1.00463	18	1.01570	28	1.01630	38	1.02219	48	1.02811
9	1.00521	19	1.01629	29	1.01689	39	1.02278	49	1.02871
								50	1.02930

Cents -

0	1.00000	10	0.99424	20	0.98851	30	0.98282	40	0.97716
1	0.99942	11	0.99366	21	0.98794	31	0.98225	41	0.97660
2	0.99885	12	0.99309	22	0.98737	32	0.98169	42	0.97603
3	0.99827	13	0.99252	23	0.98680	33	0.98112	43	0.97547
4	0.99769	14	0.99194	24	0.98623	34	0.98055	44	0.97491
5	0.99712	15	0.99138	25	0.98567	35	0.97999	45	0.97435
6	0.99654	16	0.99081	26	0.98510	36	0.97942	46	0.97379
7	0.99596	17	0.99024	27	0.98453	37	0.97886	47	0.97323
8	0.99539	18	0.98966	28	0.98396	38	0.97829	48	0.97266
9	99481	19	0.98909	29	0.98339	39	0.97773	49	0.97210
								50	0.97153

 Ephraim Segerman

On The Measurement of Tessitura and Movement in Music

When we want to discuss how high or low in average pitch a vocal or instrumental line of music is, we use the term 'tessitura'. To determine it nowadays, we survey the music and intuitively estimate the average pitch, taking into account how long each note is at its pitch. In the not-to-distant future, when all music will be computer-readable, the computer will gladly calculate this average pitch for us.

The average pitch of a melodic line could be calculated as follows: Find the lowest pitch and shortest note value. Make tables showing each pitch as i semitones above the lowest, and each note value as j times the time-length of the shortest. One next has to add up all of the time t_i spent at each pitch (i semitones above the lowest), one pitch at a time. To do this one needs to count the number of notes of each note-value (j times the smallest). Let us call this number n_{ij}. Then the time at that pitch, t_i, is the sum of n_{ij} times j for all note values. We express this mathematically as $t_i = {}_j\Sigma(j*n_{ij})$, where ${}_j\Sigma$ means sum over all j's and * means multiplication. Then the average pitch i_a, weighted according to how much time each pitch is held, is $i_a = {}_i\Sigma(i*t_i)/{}_i\Sigma t_i$, where ${}_i\Sigma$ is the sum over all i's (pitches), / means division, and ${}_i\Sigma t_i$ is the total time for all notes. The pitch that this average most closely corresponds to is read from the pitch - i table.

When we want to discuss quantitately how fast a piece of music goes, if there is a rhythm (i.e. a regular pattern of note stresses), we may be interested in how fast the beat of the rhythm is. For that we pick a note value characteristic of that rhythm, and give its MM (metronome marking). This does not tell us how fast the notes go by, which we can call 'movement'. If that is what we want to express, we usually survey the music and intuitively estimate the average note value and give its MM. As with tessitura, this can be done accurately by computation.

If the music being considered is a single vocal or instrumental line, we can proceed in a similar way as with tessitura. If music with more than one line is being considered, then the time values of the music have first to be transcribed into a notation (such as lute tablature) that only gives the note values between the beginning of each note and the beginning of the next note that sounds (irrespective of what voice that next note is in). This gives a single sequence of note values and rests, as with a single line.

As with before, we express each note value as a multiple j of the shortest note value, make a table of j's for the note values, and count up the number of notes n_j of each note value. Then, the average time for each note value (in units of the smallest note value) is the total time divided by the total number of notes, or $j_a = {}_j\Sigma(j*n_j)/{}_j\Sigma n_j$.

Using the nearest note value j to the calculated j_a is very inaccurate, and a more accurate measure may be called for. One such measure could be the average time (in seconds) per note. For this we should already know the tempo as a particular note value, with its associated j (we shall call this special one k) and its tempo of MM_k. The time in seconds of that particular note value is $60/MM_k$. Then the average time per note in seconds is $(60/MM_k)*(j_a/k)$. Another measure could be the average number of notes per minute (analogous to MM). This would be $MM_k*(k/j_a)$.

The reader may have noticed that what we want for tessitura is the average pitch, not the average frequency. This is because the ear is more sensitive to ratios of frequencies than differences, and pitch represents such ratios. An average is an arithmetic mean. We would get the same result working with frequencies if we took the harmonic mean (see Comm 664). Similarly, the ear is more sensitive to ratios of tempos than differences. Tempo is a kind of frequency. Thus there is reason to argue that a measure of movement should involve a harmonic mean of the tempos of each note value (which is mathematically complicated) or do our arithmetic means on tempo steps (the tempo analogies to pitches). These tempo steps are defined and discussed in another Comm in this Q called 'An Equal-Temperament Scale for Tempo'. To do this, the above procedure needs to be modified only in the table of j's for the note values, the j's now being the number of tempo steps between that note value and the shortest one. There is no accuracy problem with the result being the tempo step closest to the calculated j_a. Such a quantitative measure of movement can be quite useful when discussing early ranges of movement that we are not familiar with nowadays.

An Equal-Tempered Scale for Tempo

There are many analogies between pitch (frequency) and tempo. Both need complicated equipment to measure directly, but ratios have always been easy to measure. Frequency ratios are heard as intervals and the ratios determined by a monochord. Tempo ratios have been measured by counting the number of beats of each between starting together and their next coming together again. Both of these quantities have favoured or 'sweet' ratios. For pitch, the main favoured ones are: a ratio of 2/1 which is an interval of an octave, 3/2 a fifth, 4/3 a fourth, 5/4 a major third and 6/5 a minor third. For tempo, the main favoured ones are: a ratio of 3/1 which is proportio tripla (or tertia), 2/1 proportio dupla, 3/2 proportio sesquialtera and 4/3 proportio sesquitertia.

To facilitate arbitrary transposition of pieces to different pitches on fixed-pitch instruments, an equal-tempered scale of pitches was invented. Ratios between these pitches are approximations to the pure ratios. The octave, which has an exact ratio of 2, is divided into 12 equal semitone ratios, each one being $\sqrt[12]{2} = 1.05946$, or a difference of about 6%. The equal-tempered scale gives frequency errors of about 0.1% for the fifth and fourth, 0.8% for the major third and 0.9% for the minor third. Above c' (ca 500 Hz.), where the ear is at its full sensitivity, it doesn't notice a frequency difference of less than about 0.4%. So the differences for the fifth and fourth are not noticeable, while we have learned to tolerate the noticeable differences for the two types of thirds.

The number of equal-proportion divisions of the octave couldn't be less than 12 because it has to accommodate the semitone between the major and minor third. If we do the same for tempo, we have to accommodate the difference between proportio sesquialtera and proportio sesquitertia. This can be done by division of proportio dupla into five equal proportional steps. The tempo ratio for adjacent tempo steps would be $\sqrt[5]{2} = 1.14870$, or a difference of about 15%. The ratio for two tempo steps is 1.320, the approximation for the 4/3 of proportio sesquitertia. The ratio for three tempo steps is 1.516, the approximation for the 3/2 of proportio sesquialtera. The ratio for five tempo steps is exactly 2 for the 2/1 of proportio dupla. The ratio for eight tempo steps is 3.031, the approximation for the 3/1 of proportio tripla. Since note values are related to one-another by factors of two or three in tempo, all note values can be accomodated as points on this scale.

All of the approximations to the true proportions of tempo made above are in error by about 1%. This accuracy is very acceptable since Quantz (1752) mentioned that a difference of 6% (5 beats per minute in 80) was not noticeable. Even within the strictest adherence to tempo standards, there must have been a range of tempos above this threshold where tempo differences were noticeable but were still considered the same tempo. There is no evidence for this difference ever being less than 1 tempo step. In my analysis of late 17th century English tempos in Comm 1129, I got reasonable comparisons between different sources by assuming that 'almost as fast (or slow)' meant up to 1 tempo step, 'a little faster (or slower)' meant more than 1 and up to 2 tempo steps, and 'faster (or slower)' meant more than 2 tempo steps.

The pulse has been used historically to define tempo standards. Two of these tempo steps correspond with the range of the normal pulse rate. The pulse can be specified as being at its mean value, with a range of plus or minus one tempo step. The mean value of the normal pulse, at 70 MM (Metronome Marking, or beats per minute), fixes the scale. Following is the scale in MM with a suggested notation (p refers to pulse) beneath to specify each step:

17	20	23	27	30	35	40	46	53	61	70	80	92	106	122	140	161	185	212	244	280	322	369	424
P'0	P'1	P'2	P'3	P'4	P0	P1	P2	P3	P4	p0	p1	p2	p3	p4	p'0	p'1	p'2	p'3	p'4	p"0	p"1	p"2	p"3

The value of setting up such an equal-tempered tempo scale is in making comparisons between absolute tempos easier and more related to our tempo perception than using the MM scale. The MM scale is linear and one has to use multiplication or division to get from one tempo to another related tempo. This scale is logarithmic and converts MM ratios into tempo steps that can simply be counted to get proportions, just like our musical scale converts frequency ratios into semitone steps that can be counted to get intervals.

Gerle on Tempo

Steve Heavens has kindly provided me with translations of the sections relating to tempo in Parts I and II of Hans Gerle's *Musica und Tablatur*., published in Nuremberg (1546). What Gerle wrote in this instrumental tutor about intabulating vocal music is particularly valuable to us for several reasons. One is that it mentions a difference between the way singers and instrumentalists counted the music. Another is that the book's purpose was purely practical, and therefore more objective about reporting local contemporary practice than the work of a theoretician. A theoretician was likely to have read more widely and encountered conflicting writings from different times and places, and then come to his own individualistic synthesis in the search for universal truth. Modern theoreticians have similar difficulties. Also it gives information on the absolute tempo standard (as well as on relative tempos for different time signatures), and how tempo was changed when the notation asked for a tempo that was too fast to play.

The book is in five parts, and though the first two are primarily concerned with viols (grosse Gevgen), they contain the basic instructions applicable to all parts for reading tablature and transcribing music into tablature.

The relevant sections of Part I start with explaining the timing symbols in the tablature. The general concept of timing was called *Mensur* and its basic measuring unit was the *schlag*, 'of which one is as long as another'. The usual translation of *schlag* is "beat", but using it would be misleading nowadays because we consider the beat as a component of the bar (American "measure"), while the *schlag* was more akin to our bar itself. It was the German equivalent to the Latin "tactus". Gerle's use of the term was broader than just a timing unit since he referred to different patterns of subdividing its constant time into smaller units as different *schlags* (i.e. different types of contents). The *schlag* was clearly shown in the intabulated music by bar lines in triple-time music, and in duple-time music by the spacing of the symbols into *schlag* units without bar lines in the bowed-instrument tablatures, but with bar lines at every two *schlags* in the lute tablatures.

A simple way of learning the time of the *schlag* was 'from the striking of a bell which indicates the hour'. This was most likely the same or a very similar bell that Hans Neusidler similarly wrote about in *Ein newgeordent Kunstlich Lautenbuch*, also in Nuremberg, a decade earlier (1536). Neusidler wrote 'A stroke such as | must be played so that it sounds neither longer nor shorter than the striking of a clock or bells on a tower, or when one counts up money nice and gently and says "*eins / zwey / drey / vier*", one as long as another. The striking of the bell or the counting up of money corresponds to the long stroke | and is called one *schlag*.' From the counting up of money, I have previously estimated that the time of a *schlag* was about four pulses of the blood. I am now trying to read up on the history of bells to see if this can offer an independent estimate. If the rate of striking then was the same as that of Big Ben now (as we can hear on the BBC News), then it would be the same.

Gerle mentioned an interesting difference between viols and lutes. The type of *schlag* that has eight fusae, 'which occur in ornamented [*collerirten*] pieces, is very rarely used with viols but is common with lutes'.

In Part II, for a number of different time signatures (mensurations), Gerle indicated the number of *schlags* each note value was worth in the tablature, and the tablature timing symbol above the fingering symbol for that note value. If there was more than one tablature timing symbol for that note value, the fingering symbol was repeated to be under each timing symbol, thus leading to ambiguity as to whether a note was repeated or held for the total time indicated (nevertheless Gerle mentioned that the bow movement had to change after each semibreve).

The information given by Gerle, in the order he presented it, is summarised in the following table:

Number of *Schlags* and Tablature Timing Symbol for each Note Value

Signature	Maxima	Longa	Brevis	Semibrevis	Minima	Semiminima	Fusa	Semifusa
¢ white	8	4	2	1	1/2	1/4	-	-
(tab)	....	..	.	|	┌	╒	-	-
black	-	-	3/2	3/4	-	-	-	-
(tab)	-	-	|┌	┌╒	-	-	-	-
Φ white	12	6	3 or 2	1 or 2	1/2	1/4	1/8	1/16
(tab)	-	-	-	-	-	-	╒	╘
black	8	4	2	-	-	-	-	-
¢3 white	-	2	1	1/3	1/6	1/12	-	-
(tab)	-	|┌|┌	|┌	┌	╒	╘	-	-
black	-	-	2/3	-	-	-	-	-
(tab)	-	-	|	-	-	-	-	-
3	-	-	-	2/3	1/3	1/6	-	-
(tab)	-	-	-	|	┌	╒	-	-
triplets	-	-	-	-	1/3	1/3	-	-
(tab)	-	-	-	-	┌	┌	-	-

In this table, a - signifies that this note value was not mentioned. The mensurations ¢ and ¢3 were described as 'imperfect', that of Φ as 'perfect' and that of 3 neither 'imperfect' nor 'perfect'. The Φ white breve was worth 3 *schlags* if it was adjacent to other breves, and 2 if it was not. The white semibreve was worth 1 *schlag* except when it was worth 2 *schlags* (if it was followed by a breve and preceded by 2 or 3 other semibreves, one of which had a dot over it). The tablature timing symbols for Φ were not given, apparently because they were the same per *schlag* as for ¢. Gerle mentioned that there tended to be many fusae in Φ. The section on 'Fusa and Semifusa' followed, and it obviously referred to Φ, but its application to ¢ was apparently considered obvious. The mensurations ¢3 and 3 were described as different types of proportion (*Proportz*) or tripla (*Tripel*). There rarely were breves in the 3 mensuration, only semibreves, minims, semiminims and occasionally fusae. In triplets the number 3 was placed underneath the middle one of three minims or semiminims and only applied to them (meaning 3 in a *schlag* irrespective of the note value).

From the above, the tablature symbol | represented one *schlag* in ¢ and Φ, and 2/3 of a *schlag* in ¢3, 3 and triplets. Otherwise, the intabulation compensated for varying note lengths in different note colours and different mensurations in the mensural notation. These lengths can be represented by the number of *schlags* for a white semibreve, which were: 1 in ¢ and Φ, 2/3 in 3 and 1/3 in ¢3. These would represent the relative tempos for these mensurations if we can be sure that the *schlag* time was constant in all cases.

What Gerle wrote about the *schlag* when introducing proportion can cast some doubt on its constancy. In Part I, he wrote */ Allein dz merck zuvor / anderthalb der vorigen schleg die ich dir hab anzeygt / ist in der Proportz nur ein schlag /* (Only note that 1½ of the *schlags* which I have shown previously is only one *schlag* in the proportion). In Part II he wrote */ in dem selben gesang werden der vorigen schleg des vorangezeygten gesangs / alweg anderthalben schlag gemacht auff ein schlag wie ich im Ersten tayl diss Buchs anzeygt hab /* (In this song the *schlags* of the previously shown song are always made 1½ *schlags* to one *schlag*, as I have shown in Part I of this book).

This is ambiguous as to whether the word *schlag* here referred to the contents of a *schlag* or the time of a *schlag*. If it was the contents, then the time of a *schlag* would be constant in all mensurations. If it was the time, then the *schlag* in ¢3 was 1½ times longer than otherwise (when discussing the mensuration 3, Gerle just used the term *schlag*, without indicating that there was anything special about it, as he did with ¢3). The former is much more likely since it gives ¢3 the right proportional relationship with ¢.

After his general introduction to mensural notation and before he discussed any specific mensurations, Gerle made an interesting comment about a difference between vocal and instrumental music. In translation it reads: 'You also need to know what a *schlag* is in the tablature: in the song it is only a half *schlag*, so that a brevis is worth one *schlag* in the song but is worth two *schlags* in the tablature. Singers call the *schlag* a "tempus"; I mention this so that you understand this when you discuss it with a singer.'

There are two interpretations of this passage. One, consistent with the above conclusion, where the time of a *schlag* is invariant (following the bell tolling the hour), indicates that singers performed the music twice as fast as tablature-reading instrumentalists. The other is that the singers recognised a *schlag* that was twice as long as the instrumentalist's *schlag*, but they both performed the music at the same speed. In my general study of the history of tempo, I had to assume the first of these interpretations for the first half of the 16th century to make sense of several pieces of evidence on the tempo for ¢ taken by singers and instrumentalists. In support for the second of these interpretations, various theoreticians of the time indicated that there was variation in whether the tactus (i.e. the *schlag*) corresponded to the breve or semibreve.

These two interpretations need not be mutually exclusive. They each can be true in different circumstances, and the difference between them could well not have been considered important at the time. This would be the case if musicians then felt as free to double or halve the speed of a composition as we today would, say, transpose to another key. Gerle described just such a practice in a passage that appears after his discussion of Fusa and Semifusa:

'Note however that a song which is perfect and has many fusae and semisuspir [semiminim rests], but no brevis, cannot be properly transcribed. Since it would go too fast, when one sings such a song one takes a slow measure so that a minima is always sung as a semibrevis, a semibrevis as a brevis or a fusa for a semiminima; also a semisuspir is sung as a suspir [minima rest] and a suspir as a whole [semibreve] rest. Thus in transcribing you must also put 2 rests in the tablature when there is one rest in the song, and also make a suspir into a whole rest, a semisuspir into a half rest, a fusa into a semiminima, a semiminima into a minima, a minima into a semibrevis, a semibrevis into a brevis, a brevis into a longa, and so on. Thus you have the notes of perfect and imperfect songs that one calls "with diminution".' Gaffurius (translation in Schroeder, *Musica Disciplina*, (1982), p. 151) wrote that musicians often incorrectly called augmentation 'diminution'.

This passage implies augmentation ambiguity in the notation then. This could be related to the disappearance of C as a time signature early in the 16th century. Since music signed by ¢ would be performed at that speed whenever it felt 'right', it would almost be an insult to the performer to specify it.

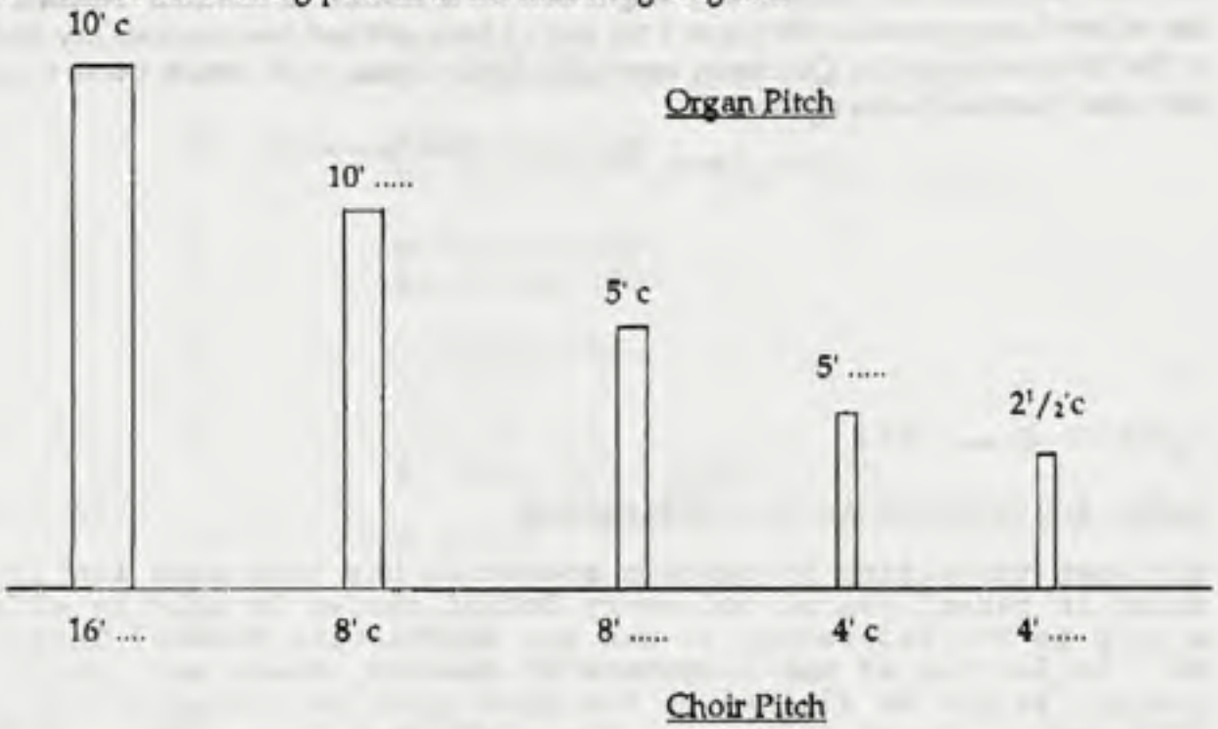
There is no mention here, or anywhere else in Gerle's book, of tempo changes that violate the tempo standard. If one wanted to slow down, one halved the speed. Most modern scholars have reluctantly accepted in theory that the early sources strongly imply that tempo standards were then adhered to. In practice they get into trouble. If they assume a 'reasonable' absolute tempo, they sometimes find a mensuration change that goes too fast for even modern ears. The obvious but unpalatable solution, that also seems to fit the direct evidence on tempos, is that the absolute tempos actually were 'unreasonably' slow.

The Transposing Organ and Choir Pitch in England: a short test.

The relationship between choir and organ pitch was described by Nathaniel Tomkins in 1665, and was quoted by Stephen Bicknell in *BIOS Journal 9*, p. 79:

'The great Organ which was built at Worcester consisted of two open diapasons of pure and massy mettall double F fa ut of the quire pitch & according to Guido Arentines scale (or as some term it double C fa ut according to ye keys & musicks) an open pipe of ten foot long. ye diameter 7 inches & an half, (at St. Pauls Lond ye diameter was 8 inches).'

1. Fill in the missing pitches in the following diagram.



2. a) In order to reproduce 5ft pitch when using an 8ft stop, by what interval should the transposition up be made?

   b) In order to play at Choir pitch (8ft) on a 10ft stop, by what interval should the transposition up be made?

3. If the 10ft organ has a meantone tuning with unusable keys of B, C#, F# and Ab, which one becomes usable when performing at Choir pitch, and which of the eight others becomes unusable?

Please note:

These questions were formulated for the benefit of modern British organists who may be interested in the pre-Restoration repertoire but are not familiar with the 'transposing'/ten foot organ. FoMRHI members should be aware that

a) the above diagram is only supposed to be an aid to thinking, and measuring instruments should not be used for testing ratios etc.

b) don't be guided by foot lengths: a pipe 'ten foot' long (as normally given in contracts) may actually be longer than that, and a pipe 'eight foot' long may be shorter - it is a pitch indication which modern organists are familiar with, equating it with 'unison', or 'the same as the piano'.

c) I have equated 'Choir pitch' with 'eight foot pitch' only because it is 'unison' as defined in b) above, i.e. untransposed.

The first two questions formed part of a BIOS seminar at Stanford on Avon last September, as an introduction to the understanding of the seventeenth century remains of organ there. Not only could no one answer them, but many of the participants had no idea what a ten foot/five foot organ was, which thus pulled the carpet from under my feet as far as the rest of my talk went. I consequently produced the questions and answers for the BIOS Reporter, but thought they might also be of interest to FoMRHI readers, since the subject has appeared in its pages. I am sorry I have not had time to relate my findings to the information in the Quarterly, especially Eph's Comm 1127, which I was forced to put a few question marks against.

(see Comm. 1261 p. 60 for answers)

FoMRHI Comm. 1253

Early instruments in St. Petersburg — Uta Henning

Although travelling to eastern countries has been much facilitated in recent years, not every FoMRHI reader is able to afford a trip to St. Petersburg to see the spectacular Musical Instrument Collection at the Institute of Theatre, Music and Cinematography. As can be gleaned by the catalogue, it contains e.g. an 18th-century regal organ, and there are such famous names as Denner, Guarneri, Hotteterre, da Salo, Stanesby, Tielke and Tromlitz represented in it (a review of the catalogue appeared in GSJ 28, 1975, p. 135 f.)

Our member Felix Raudonikas has been kind enough to deposit professional photo negatives documenting many of these instruments with a private address in Germany. This is a first-rate pictorial source really as the catalogue contains only a few overall photos, whereas these negatives often show details which such a concise catalogue is not able to render. The following list gives a short description of the instruments in question, together with the museum's inventory numbers and catalogue entries, plus the number of photos available. Felix's wife who is studying the harpsichord in Munich at the moment is willing to answer enquiries and to have n-prints (18 x 24 cm) made at DM 16.- each, plus postage. Anybody interested may contact her directly: Ella Sevskikh, c/o Fam. Kiock, D-80801 München, tel. 089/349611.

inv. no.	cat. page	instrument	no. of negative
1	56	transverse flute J. G. Tromlitz, 1725 - 1805	2
86	91	viola d'amore J. G. Hellmer, 1687 - 1770	3
211	99	violone no date	4
294	90	descant viol L. Guersan, c. 1713 - c. 1781	3
295	91	viola d'amore L. Socquet, 2nd half 18th cent.	3
297	92	viola d'amore A. Jaiss, 1685 - ?	3
299	90	descant viol no date	3
300	90	descant viol R. Höss, act. 1680 - 1739	3
315	106	vihuela 17th cent.	3
316	106	guitar Italy, 17th cent.	5
319	106	guitar Italy, no date	3
401	52	treble recorder Lot, no date	2
402	52	treble recorder P. Bressan, c. 1720	2
403	52	treble recorder M. Parent, before 1711	2
404	52	tenor recorder C. Bizey, act. 1716 - 52	2
405	52	tenor recorder Hotteterre, 17th/18th cent.	2
406	52	tenor recorder 18th cent.	2
407	53	tenor recorder J. C. Denner, 1655 - 1707	31
408	53	tenor recorder T. Boekhout, mid-18th cent.	25
4		er cent.	24

inv. no.	cat. page	instrument	no. of negatives
424	106	vihuela M. Hummel, end 17th/beg. 18th cent.	6
437	55	transverse flute (?) 16th cent.	1
438	55	transverse flute 16th cent.	1
460	57	transverse flute 18th cent.	2
462	55	transverse flute D. Lot, no date	2
463	55	transverse flute 18th cent.	4
464	56	transverse flute 18th cent.	2
465	56	transverse flute Naust, beg. 18th cent.	4
468	56	transverse flute 18th cent.	2
469	56	transverse flute M. Lot, c. 1780	2
470	56	transverse flute J. A. Crone, 1727 - 1804	2
471	55	transverse flute Hotteterre, 17th/18th cent.	8
472	55	transverse flute Hotteterre, 17th/18th cent.	4
473	62	bass transverse flute T. Lot, c. 1740 - 85	4
474	55	transverse flute Keller, no date	2
486	68	clarinet J. W. Oberlender, 2nd half 18th cent.	4
508	64	oboe J. C. Denner, 1655 - 1707	6
528	75	bassoon J. C. Denner, 1655 - 1707	5
787	106	vihuela 17th cent.	4
790	106	chitarra battente no date	

inv. no.	cat. page	instrument	no. of negatives
853	56	transverse flute R. Potter, 1728 - 1806	2
855	56	transverse flute J. G. Tromlitz, 1725 - 1805	1
893	92	barytone Germany, 1729	7
1030	90	bass viol T. Edlinger, act. 1656 - 90	3
1031	91	descant viol Germany, no date	3
1043	90	descant viol J. Jaiss, 1715 - 65	3
1044	90	descant viol no date	3
1049	90	descant viol no date	3
1062 and 1157	4	headpieces of 2 treble recorders 18th cent.	2
1085	107	guitar Italy, no date	3
1147	55	transverse flute (without headpiece) 18th cent.	1
1564	92	viola d'amore Fischesser, 2nd half 19th cent.	1
1996	91	bass viol no date	5
2169	90	bass viol J. Tielke, 1641 - 1719	3
2265	91	viola d'amore no date	3
2310	91	violone no date	3
2360	58	transverse flute T. Stanesby, 1692 - 1754	2
2534	91	bass viol J. H. Goldt, c. 1700 - 75	7
without	not included	oboe headpiece: R. Haka, 1645 - 1700 middle piece: M. Lempp, 1788 - 1822 bell: modern	6

FoMHRI Comm. 1254 John R. Catch

Catlins, Coloured and Loaded Strings

Usage is important, spelling and pronunciation less so. Catlin(g) it seems is not recorded for the cat-rope, any more than rat-rope for ratlin(e) or bow-rope for bowlin(e). "Line" and "rope" are properly not synonymous in technical use, "the name rope being given to cordage above one inch in circumference" (O.E.D.). I cannot recall any example of the term "line" being applied to a musical instrument string. On evidence, I was quoting Segerman in "E.M." 1976 ("The only evidence we have on the construction of Venice Catlines lies in their name"); and the peculiar structure is that which Segerman describes, or (to quote the NMM) "four or six parts of the line, arranged in pairs opposite one another"; not just a rope, but a rope of a peculiar kind.

I think it more probable that the name for the string never had anything to do with the mariner's cat-tackle, but is a diminutive of "cat". "Cat" and "kit" have long-standing associations with fiddling and fiddles, although the O.E.D. is non-committal about the etymology. Catling and kit can both mean a small cat; catling and catgut refer to fiddle-strings; a dancing-master's fiddle is a kit; caterwauling is suggestive of the unskilled fiddler. I am dubious of the significance of Segerman's suggestion about "stroking the strings", for strings other than catlins were also stroked. The verbal association of cat and fiddle seems to have been traced back only to ca. 1765 ("Oxford Dictionary of Nursery Rhymes") but it may be older; witness the remarkable example of "I have four sisters beyond the sea", with written records in the early 15thC and from 1838 onward, but nothing in between.

The historic evidence advanced for "loaded" strings is a) sizes of the holes in old lute bridges; b) colour; and c) "red strings especially rich in mercury" and blue with "significant traces of lead" (Peruffo, Comm. 1021; Cohen, GSJ XXXVI, 37). I comment only on b) and c).

Red, blue and green violin strings were not uncommon sixty-odd years ago; I remember them well. The colours were transparent or translucent, not those of an opaque pigment, and certainly had nothing to do with any alteration of density. In default of any other evidence it seems likely enough that Mace's coloured strings and those depicted in paintings were coloured in the same way.

c) is a mare's nest. The strings referred to were newly invented in 1798, and not of gut but of silk. "Especially rich in mercury" means, in chemical parlance, having much more than would be expected - which would be virtually nil in silk. It does not mean enough to have a significant effect on the density, any more than would a pathologist's report that a cadaver contained a very high lead content. Cohen states that the colours were to indicate pitch, and says nothing whatever about their having a density higher than normal. It was predictable (as Peruffo found on trial) that chemical binding of heavy metal atoms to gut, with or without a mordant, could not give any effective increase in density. It would be a mockery of scholarship to advance this 1798 information as evidence that gut strings impregnated with a dense bronze lacquer exemplify 17thC practice.

These observations are not meant to be destructive, or discouraging of conjecture and experiment. But let us not apply historic terms to modern fabrications with little or no evidence, let alone proof, that they correspond to the historic originals. Many musicians, I fear, accept these attributions as gospel. Let us experiment by all means, and use what we like best, calling them factually ropes or high-twist or loaded, without any illusions that we know the historic answers; for quite obviously we do not.

I thank Elaine Aldred for help in examining an "Aquila" string.

FoMRHI Comm 1255 Ephraim Segerman

On Historical String Tensions on Lutes

Mersenne's Tension and the Theory

In Comm 129 (Q11), I deduced an original lute string tension of 2.0–2.3 Kg from the statement by Mersenne (Second Book, Prop. II) than an 11th string on a theorbo or lute was 1 line (2.28 mm) thick. The same tension applied to other strings, the diameters of which Mersenne mentioned, because they were inversely proportional to the frequency. This calculation could be done without knowing the string stop or tuning pitches. All that was assumed was the breaking stress of gut and the number of semitones below the breaking pitch (for that length) that the string was tuned to.

Let us look at the theory of the situation. In the following equations, * represents multiplication and / represents division. According to the Mersenne-Taylor Law, $f = [1/(2*L)]*\sqrt{(T/m_L)}$, where f= frequency, L= vibrating length, T= tension and m_L= mass per unit length. But $m_L = d*A$, where d= density and A= cross-sectional area (= $\pi*D^2/4$, where D= diameter). The string stress S= T/A, so $f*L = [\sqrt{(S/d)}]/2$. At the breaking frequency f_b and breaking stress S_b, $f_b*L = [\sqrt{(S_b/d)}]/2$. The right side of this equation is a constant, and so it can be measured for an individual string by multiplying the vibrating length by the frequency at which it breaks. An approximate general figure for gut is $f_b*L = 24{,}000$, where f_b is in Hertz (Hz) and L is in cm.

Let us consider that a string is tuned to f_n, which is n equal-tempered semitones below the breaking pitch. Then $f_n = f_b*2^{-n/12}$ and $f_n*L = f_b*L*2^{-n/12} = 24{,}000*2^{-n/12}$. For gut, where L is in cm, D is in mm and T is in kilograms, the Mersenne-Taylor Law becomes $f*L = 4{,}809*(\sqrt{T})/D$. Consequently $24{,}000*2^{-n/12} = 4{,}809*(\sqrt{T})/D$, resulting in $T = 25*2^{-n/6}*D^2$, which is the useful result.

Analysis of Praetorius's information on pitch standard, nominal pitches and string lengths (from the scaled drawings) suggests that whenever the highest string was traditionally tuned as high as it would go, it's pitch was about a tone below the breaking pitch. So n, the number of semitones below the breaking pitch of a string on such an instrument, would be the number of semitones below the pitch of the highest string plus two. That number is 35 for Mersenne's 11th string, so for a diameter of 2.28 mm, the tension calculates to 2.3 kg.

We have reason to entertain some doubts about how real this figure is. Mersenne's method of proportions for string diameters works if the string lengths stay the same, as with an 11-course lute, but not if they change, as with the theorbo. Mersenne did not distinguish between the two cases. A lute with an 11th course then would have had to be of a very new type. His illustration, most of his discussion and his report of the Italian method of tuning (Prop. XI) include only 10, but he mentioned 11 courses (Prop. I and II) and 12 courses (Prop. XII). It appears that Mersenne was intent on illustrating how to calculate string diameters in proper proportion, and starting with an 11th course made this particularly easy. Though he was probably not reporting measurements on any particular instrument, it is likely that his string diameters were not very different from real ones.

If our theory were to include different string lengths for the first string (L_1) and the string tuned n semitones below breaking pitch (L_n), then $T = 25*2^{-n/6}*[(L_n/L_1)*D]^2$. If the reader wants to do a calculation using this formula and his or her calculator does not do exponentials, following is a list of values of $2^{-n/6}$ underneath the values for n. They are expressed in % (i.e. they are the % of the breaking frequency for that pitch), so one needs to divide them by 100 before using them.

n:	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
%:	7.87	7.02	6.25	5.57	4.96	4.42	3.94	3.51	3.13	2.78	2.48	2.21	1.97	1.75	1.56	1.39	1.24	1.10	0.98

Bridge Holes

The above theory should allow us to estimate the maximum tensions of the strings on surviving extended-neck as well as single-nut lutes from the sizes of the holes in the bridges. An uncertainty here is whether each bridge is original. The judgement that it is original by an 'expert' only says that there is no clear evidence to rule out that expert's optimistic or pessimistic outlook on the situation. Such evidence could be anachronistic materials, design, finish or style of craftsmanship of

the bridge, or signs on the soundboard of a bridge lifting off or placed in a different position than before. Such evidence would still exist if the original bridge was glued back on, and it would not exist if the instrument was competently restored with a new bridge of appropriate design, materials, finish and craftsmanship. Only an objective dating technique would introduce some certainty into this matter. Meanwhile, we need to do the best we can with the evidence we have, and unless there is clear evidence otherwise, accept the assumption that the bridge is original.

The apparently obvious way to measure the diameter of a string hole in a bridge is to have a graded set of rods and measure the diameter of the largest one that goes through the hole. This is likely to underestimate the original hole size because the wood shrinks with time. This is related to the breakdown of the hemicellulose molecules into gasses, and the contraction occurs in directions that are allowed by physical constraints (one usually finds that shrinkage cracks on old lute soundboards stop at glued bars which don't let the wood contract there). The long direction along the bridge is the grain direction and hardly contracts at all, and the perpendicular direction along the glued surface is inhibited from contraction by being fixed to the non-contracting direction in the soundboard. Contraction is unrestricted along the bridge-height direction. The holes then become ovals, with the long axis closest to the original diameter, while the short axis is what the cylindrical rods measure. Oval cross-section rods would be much more accurate. I would guess that the error introduced by using cylindrical rods could be 2-5%.

There is no particular advantage in having the clearance between the wall of the bridge hole and the outside of the string small except that smaller holes drill faster. But drills that are particularly small are more fragile and less accurate than more comfortable sizes. We would thus expect that the holes for the thinner strings would have too much clearance to tell us much about the sizes of the strings that went into them, while the holes for the thickest strings would be the most informative.

We need to consider the nature of the string. The above theory assumes equal density for the low-twist gut first string and the string in question. If it were a high-twist gut string, this would be true. We are mainly interested in the thickest strings, and we would expect them to have high-twist construction only before about 1570. After then, the expansion of the lute's open string range implies some other kind of construction. The possibilities are rope construction and chemical loading of the strings. After about 1660, metal-wound strings become a possibility, but there is no evidence indicating that they were the norm before the 20th century. If rope construction were the case, the decreased average density can be compensated for in the calculations of tension by subtracting 5-10% from the diameter to make the theory work (assuming a 5-10% clearance between the string and hole, I would suggest that 85% of the hole size is a reasonable assumption for the D in the tension calculation). There is no such easy compensation for the increased average density of chemically-loaded and metal-wound strings.

In Comm. 1235 I presented arguments why Pistoy Basses with their 'deep dark red colour' were not a staple component of early stringing practices. There was no argument there against the hypothesis that all of the bass strings were chemically loaded. One is that Mersenne's perscription for stringing would make basses heavier than necessary. Another is appearance. At the end of the second paragraph of 'Other Necessary Observations' in Robert's *Varietie of Lute Lessons*, John Dowland wrote 'The choosing of strings is not alone for Trebles, but also for small and great Meanes: greater strings though they be ould are better to be bourne withall, so the colour be good, but if they be fresh and new they will be cleere against the light, though their colour be blackish.'

This discussion of strings thicker than great Meanes refers to the fourth and lower-tuned courses, just the ones we are interested in. There is no differentiation between them, so we can presume that it applied to all. He seems to be saying that they last and don't need to be replaced regularly as long as the colour doesn't go bad; that their colour is normally somewhat dark, and when such strings are new, they are somewhat translucent. I doubt whether chemically-loaded strings can be translucent at any time.

Mimmo Peruffo has faxed me some very interesting measurements of bridge-hole diameters on original lutes, and I expected a paper on them from him. That hasn't come. I applied the above theory to them, and get the impression that tensions on lutes in kg were 2 for 6 and 7 courses, 1 3/4 for 8 and 9 courses, 1 1/2 for 10 courses and archlutes, 1 1/3 for 11 courses and 1 1/4 for 13 courses. Let us hope that he publishes it soon, and then I will discuss this further.

Ephraim Segerman

Stringing 5-Course Baroque Guitars

'Baroque guitar' is a modern term. The instrument was called a 'guitar' unless there was ambiguity with a different instrument, such as the wire-strung English guitar, in which case it was called a 'Spanish guitar'. Peg and bridge provision was made for 10 strings in 5 pairs. Yet often the first course only used a single string rather than a pair.

String Stops and Size Names

Italian manuals indicated that there were three sizes. The usual one, being the middle size, was called 'chitarra mezzano'. Its string stop was 65–70 cm, and the nominal pitch of the first course was stated to be e' in some sources and d' in others. Whenever a pitch standard was relevant, it usually was about a tone below modern. The 'chitarra grande' was tuned a tone lower than the chitarra mezzano (the Strad in the Ashmolean is one), and the 'chitarra piccola' was tuned a fourth higher (a fifth higher than the chitarra grande). The 'chitarrino' was a survival of the 4-course Renaissance guitar, and was treated like a chitarra piccola without its 5th course.

Absolute Tuning Pitches

The baroque guitar methods never started the tuning instructions by indicating that one tunes the highest string as high as it can go without breaking, as was often the case with the lute, violin and viols. According to my analysis of Praetorius's string usage, that pitch was about a tone lower than the breaking pitch (which is independent of string diameter and tension) of a low-twist gut string of that length. I would expect that the highest string of a baroque guitar would then usually be lower than this for its length. If that pitch was three semitone below breaking pitch, the highest pitches of the first string (or course) would be:

string stop (cm)	76	72	68	64	61	57	54	51	48	45	43	40
pitch (@440 Hz.)	c'	c#'	d'	e♭'	e'	f'	f#'	g'	g#'	a'	b♭'	b'

If necessary for playing with other instruments, the guitar could be tuned higher, but this was rarely necessary before well into the 18th century because of the low pitch standard.

Modern players of these instruments tend to use somewhat higher pitches than these. This presents no problems with nylon strings, but if the original gut string material is used, players will have to tolerate a higher rate of first-string breakage than the original players did.

Relative Pitches of the Strings

The second course always was a unison pair tuned a fourth below the first. The third course also always was a unison pair, and it was tuned a major third below the second. Each string of the fourth course could be tuned either a fourth lower than the third, in which case it was called a 'bourdon', or a fifth higher than the third (an octave above the bourdon). If there was one of each, it was said that the course 'had one bourdon'. The bourdon was the string of the pair that was placed closest to the third course. The fourth course could also have two bourdons or no bourdons. In the former case both strings were at the lower octave, and in the latter case both strings were at the higher octave. The possibilities for the fifth course were the same as for the fourth course, but at a fourth lower in pitch. As with the fourth course, when there was one bourdon, it was on the side nearest to the previously-mentioned course.

The number of bourdons on the fourth and fifth courses varied considerably. Both having two bourdons was rare, used only in Spain. This tuning was mainly used for strumming, and possibly had descended from the Renaissance vihuela, which also had unison pairs at the low octave in Spain. Single bourdons on both courses were common in Spain, Italy and France. One bourdon on the fourth course and no bourdons on the fifth was common in the late 17th century 'golden' period, mainly in France, but used some elsewhere. No bourdons on either course was used throughout the period, and mainly for strumming. The original subtleties of strumming have yet to be explored.

Modern players, who are usually mainly lute players, tend to concentrate on music from the 'golden' period, and so usually use a bourdon on the fourth course and no bourdon on the fifth. One

bourdon on each is also popular. Strumming is used as an occasional item to give contrast and variety in programmes, and is not taken seriously enough to provide criteria for tuning choice.

Tension and Tension Distribution

Around 1700, Stradivari specified the five courses of strings over the fingerboard for a theorboed guitar. The evidence is in exhibit N, 375 in the Stradivari collection at the Cremona Museo Civico (reproduced in S. F. Sacconi's *I 'Secreti' di Stradivari*). This instrument had a string stop of about 69 cm for these strings, and it had a double first course and one bourdon on each of the two lowest courses. The specification involved strings called guitar firsts and seconds and various types of violin firsts and seconds. We can make good estimates of the diameters of the violin strings Stradivari used from my report in *The Strad* (1988), pp 52-55 (Jan), 195-201 (Mar) and 295-299 (Apr). My analysis of this guitar evidence was given in the paper 'Stringing of the 5-course Guitar' for the first NEMA Conference called 'La Guitarre Royale' in October 1985, and it appeared in the Proceedings of that Conference that NEMA subsequently published. The result is that all of the strings most probably had a tension of about 3½ kg except those in the first course and the high-octave string of the fourth course, which had a tension of about 5 kg.

The introduction to a 1729 collection of compositions by Le Cocq compiled by 'a Monsieur de Castillion' discussed the stringing of the guitar. It had a single first course and one bourdon on each of the two lowest courses. The author preferred bourdons which were open-wound with metal, which he wound himself. Concerning the other strings, he stated that the first course string was thinner than the rest, and that the third-course strings were slightly thicker than the rest.

There is no information here on string stop and actual string diameters (as there is for the Stradivari information), but my analysis of this evidence (in the same paper as above) gives the same relative string diameters and tensions for the first and second courses and the high octave of the fourth course as deduced above from the Stradivari information. These are just those strings that Stradivari called guitar strings. For strings below these in pitch, the two sets of evidence diverge, with Stradivari keeping constant tension while Castillion lowering tension with lowered pitch. In Castillion's stringing, the third-course strings have the same proportion of tension (3 semitone steps) to the second as the second has to the first. The fifth-course octave string is inbetween the third and second in pitch, and its tension is intermediate as well.

In most stringed instruments such as violins, viols, lutes and modern guitars, the main resonance pitch of the air enclosed in the body falls amongst the lower strings of the instrument, supporting their sound, while the main resonance pitch of the soundboard falls amongst and supports the higher strings. On the baroque guitar, the deep body makes the air resonance lower than the string pitches, and the small number of bars under the soundboard makes it so flexible that its resonance is amongst the lower strings. This anomolous relationship between instrument resonances and string pitches probably occurred because it gives a very attractive hollow rumbling undertone to strumming, which is what the instrument was developed for. Since the lower strings are supported by the soundboard resonance, and the higher string have no such support, some of the balance can be restored by having low tension on the low strings and increasing tension with increasing pitch, as the Castillion stringing provides. Such contraction in the range of diameters needed makes stringing particularly simple and cheap.

The abandoning of commercial guitar strings by Stradivarius for strings pitched below the second course could well be related to the instrument being a theorboed guitar. One problem posed by theorboed instruments is the potentially large transition in tone quality and string resonance between the lowest-pitched short string over the fingerboard and the highest-pitched long string on the second neck, usually pitched a tone lower. The imbalance here can be improved by enhancing the former with higher tension and suppressing the latter with lower tension. This would lead Stradivari to use a heavier fifth-course bourdon than usual on a guitar, and then to smooth out the differences between this stringing and conventional stringing inbetween this course and the high courses where the stringing is the same. This motivation could easily explain the stringing Stradivarius reported, with the Castillion stringing being closer to the norm.

To my knowledge, modern baroque guitarists have not taken any of this historical information on guitar stringing seriously. They feel comfortable with the equal-tension stringing they are used to on

their lutes and modern guitars. Lute players have about 2½ or 3 kg tension per string while modern guitarists tend to have somewhat higher tension. Some modern baroque-guitar makers have added more bars under the soundboard than originals had. This raises the resonant pitch of the soundboard and improves balance with this stringing.

The Choice of Stringing

The most common way of stringing a new instrument is to copy the stringing of another similar one. It turns out that the baroque guitar is remarkably user-friendly, sounding reasonably well with almost any kind of stringing scheme. So whatever the stringing on that 'other guitar' is, it's sound is likely to be acceptable unless one has already become used to (and expect to hear) another stringing scheme. So before becoming used to a particular scheme, it is wise to make a rational survey of the alternatives, and make choices.

When deciding on what stringing to have, the first choice to be made is the pitch of the highest string. If one insists on realising the nominal pitch of e' at modern (a' = 440) pitch, and the string stop is typical of most original instruments, one has to either accept a very high breakage rate on the first string if it is gut, or go for a plastic string. A non-bourdon fourth string as usually of the same material. Then one must decide whether the other strings will be plastic or gut.

Next one needs to decide on the number of bourdons to have on the fourth and fifth courses. Unless one is to specialise on music of the 'golden' period, the usual modern choice is one bourdon for each. If plastic bourdons are decided on, gutlon catlines produce a more original thunky sound, while strings of metal wound on nylon floss (like those used on modern lutes and guitars) produce a more modern ringing sound. With gut bourdons, the choice is between high-twist, catline, open-wound and close-wound strings, in sequence here from thunky to ringy in sound.

So far, we have the string pitches, types and materials. The next choice is whether the relative string tension distribution is to be historical, modern, or some compromise between them. This relates the string diameters so that once we have one, we can calculate the others. If one decides on an absolute tension for that one string, the diameter can be calculated from it and the string stop. One can determine the string diameter empirically to the player's satisfaction by putting on a reasonably thin string and tuning it up to whatever pitch is needed to make it sound 'right' and feel 'right'. From that pitch, the string stop and that string's diameter, one can calculate the diameter that will give the desired pitch at that tension.

Any string vendor offering a standard set of strings for baroque guitar imposes a particular set of choices on the customer. We happen to prefer strict historical accuracy because it can help us to learn about historical musicality. Most players are not interested in historical research and just want to use historical instruments and repertoire to express their own musicality, and if that happens to be modern, they can't do much about it. So they prefer stringing that makes best use of whatever technique they come to the instrument with. But the backgrounds and preferences of players vary considerably. The above was written to acquaint the reader with the issues involved in stringing these instruments so that one can make one's own decisions. If the reader has no basis for decisions, e.g. he or she wants to sell such an instrument and want to put on strings which are most likely to be satisfactory for the most likely customer, we would suggest the lute-player's nylon set (which NRI doesn't sell).

FoMRHI Comm. 1257
A reply to Comm. 1224

Erich Tremmel

The Curtals of the Maximilianmuseum Augsburg

In spring 1993 I could examine the Augsburg Curtals for an exhibition which took place in summer of the same year for the 500th anniversary of birth of Anton Fugger under the title "Die Fugger und die Musik" in the "Badstuben" of the Augsburg Fuggerhaus. Unfortunately Mr Graham Lyndon-Jones and me missed each other by two days, so I could not inform him of my results.

During my re-examination of the Fugger inventories of musical instruments (Raymund Fugger 1566 and 1580, Hans Jacob Fugger's "Instrumententruhe" for sale to Antverp, late 16th c.) I was informed by the Maximilianmuseum that its former director, Dr. Hannelore Müller, had found a note that the curtals had originally been bought for the Augsburg town band. Although I can only spread the rumour since I could not find the passage in the files of the magistrate up to the present, it seems that the curtals of the Maximilianmuseum are not the instruments of the Fugger inventory but were acquired for the same band which had the two sets of Jörg Wier crumhorns, of which the Maximilianmuseum still possesses four of the lower sizes (3 Tenor-Alt, 1 Bass; Inv.-Nr. 3009-3011, 3008). According to this rumour the curtals were bought first as a 16'-quartett of 2 basses, the quart-bass and the octave-bass, the tenor and treble being bought later.

This also is confirmed by the two different groups of signatures, the four lower ones with "HIEROS." (on one of the bass curtals filed off during a former attempt of "restoration"), the tenor and treble with something like "X X X" (see the excellent photo by Mr Lyndon-Jones on p.42 of the last Q). Mr Herbert Heyde whom I showed the instruments during a visit in 1990 interpreted this signature as Saxonian swords, similar to the famous Meissen china mark (which sounds very convincing to me).

For some rough measurements for the catalogue of the exhibition I could take the tenor and treble out of their glass case and I could not resist in trying to finger them. I can confirm that the treble curtal seems to be have been taken left-handed. It must have been, however, extremely uncomfortable to play, because the lower thumb hole is placed very low, the lateral hole for the first joint of the index finger is placed high up and then the tip of the index finger has to bend down again to cover the front hole. This means an - in my opinion - anatomically almost impossible stretch between thumb (down) and index finger (side up - tip down). There is another problem on the tenor curtal which has an upper thumb hole very far away from the front holes and requiring a comparable stretch for the upper hand. In fact the finger stretch on the two smaller curtals is more uncomfortable than on any cornett I ever had in hands, and both treble and tenor are far more uncomfortable to finger than the larger ones, even than the octave bass. If they were ever played, the treble must have been dealt with by the player with the largest hands!

Since the two small sizes sizes are said to have been (made and) bought after the four deep ones, I also doubt of the treble being able to represent anything of the kind of an assumed proto-curtal.

I assume the original intention was an attempt to enlarge the older set with 8'-instruments. Certainly the unknown saxonian maker had difficulties in tuning the treble and tenor (they fluctuate wildly in pitch, not unlike a cornett with a non-fitting mouthpiece) perhaps because of differences of musical pitch between Augsburg and Saxonia. Intonation and make of the two small curtals are so inferior to the "HIEROS."-curtals that I consider them an experiment - which probably failed.

References:
Renate Eikelmann (Herausgeber), "lautenschlagen, lernen und ieben". Die Fugger und die Musik. Anton Fugger zum 500. Geburtstag, Augsburg 1993 (still available at: Städtische Kunstsammlungen, Maximilianstraße, Schaezler-Palais, D-86150 Augsburg)

FoMRHI
Comm # 1258 G.E.King

MAKING A STAMP OR BRANDING IRON FOR MARKING MUSICAL INSTRUMENTS

The problem of making a stamp for marking my woodwinds was simplified the day I discovered that a printing company can make a rubber stamp to almost any submitted design whether this is lettering or a logo. This in turn can be sent to a dental laboratory to be cast in metal. The reproduction is then mounted on a metal rod and - presto - an efficient marking instrument, very detailed but very rugged.

Since the female mould for the rubber stamp is made by a photographic process, the original paper design can be any size within reason and then the final dimension for the stamp specified.

I discovered that for a punch, the lines of the design should be as fine as possible. Any thickness of line in the design produces flat areas in the final stamp that do not bite into the wood and leave areas of crushed fibres that are somewhat inelegant in appearance. Closely spaced parallel lines are to be avoided for the same reason.

A branding iron can be made by the same process. In this case, a plain stub or a short length of screw thread that would fit into a soldering iron designed for interchangeable tips, should be incorporated into the pattern .

Explicit instructions to the dental lab. are to cast the rubber stamp by the lost wax process in "chrome-cobalt alloy". This alloy is incredibly hard and also has high impact resistance.It will quickly dull a file or hacksaw and can only be worked with a grindstone and then only with difficulty. Because of this, it is advisable to finish the pattern as closely as possible to the final requirement before having it cast. In my case I should have mounted the rubber stamp on a short length of dowel and cut away as much as possible of the surplus rubber before having it cast. For use as a punch the casting is finally brazed to a length of drill rod.

My logo is about 3/8" in diameter and thus approximately the same size as a crown for a molar tooth . A dental laboratory should be able to cast much larger designs, up to the size of the frame for a removeable denture.

FoMRHI Comm. 1259

THREE BOXWOOD OBOES BY HENDRIK RICHTERS - Jan Bouterse

Hendrik Richters is famous for his ebony oboes, many of these instruments with carved ivory mounts, and also many with luxury silver keys. These keys sometimes have engravings of animals, but mostly we find musicians and dancers and on some instruments we find a rebus on the c-key. Apart from one tenor oboe in f1 (in Paris), a great number (about 20) oboes in c1 made by Hendrik Richters have survived. Hendrik Richters (1683-1727) had a younger brother, Frederik (1694-1770) who made oboes as well. The stamp of Hendrik Richters is H.RICHTERS (no scroll) with a clover leaf below, with the stem of the leaf pointing to the left. Frederik Richters has an almost identical stamp (F.RICHTERS, no scroll), but the (longer) stem of the clover leaf points to the right. The tenor oboe in Paris has a different stamp: H.RICHTERS in a scroll, and there is one oboe by F.Richters with smaller characters and with the addition of "IS" between the name and the clover leaf.
No other woodwind instruments by the Richters brothers are known, and that is surprising, because most Dutch woodwind makers made all types of woodwinds (recorders, flutes, doublereed instruments, and some of them chalumeaux and clarinets as well).

Cecil Adkins (University of North Texas) published an article about the Richters' oboes in the Journal of the American Musical Instrument Society, (Volume XVI, 1990, pp. 42-117). It is an interesting article, because he gives many details about the ivory carving (done on a special lathe, a "Machine à Raiseau") and about the engraved silver keys, possibly made by Hillebrand van Flory, a silversmith in Amsterdam, who was a cousin of Frederik's wife.
In Cecil Adkins' article I have seen some confusing points: the oboe Ea 284-1933 (Haags Gemeentemuseum, The Hague, Netherlands) is not made by Frederik Richters, but has the vague but unmistakable stamp of Hendrik Richters. That makes the contribution of the anonymous oboe Ea 4-x-1952 (also Haags Gemeentemuseum, and made more or less in the same style as Ea 284-1933) to Frederik Richters unclear, despite the year 1744, engraved on the C-key. As compensation I discovered the stamp of Frederik Richters on the oboe Ea 434-1933 (again Haags Gemeentemuseum), an instrument made of plumwood (maybe), and stained dark brown.
Adkins gives no information about some more anonymous "Richters-style" oboes in the collection of the Haags Gemeentemuseum. Some of these instruments are very strange, with bad fittings keys with upside down engravings (and with many more deviating details), but there is at least one instrument with a middle joint in the same style as the oboe Ea 284-1933.

Adkins reports in his article only one boxwood oboe by Hendrik Richters, in the Horniman Museum in London, with the bell missing or not original. After 1990, two other boxwood oboes by Hendrik Richters are discovered. One is now in the Bate Collection in Oxford, the other one is in a private collection in the Netherlands (I don't know where the instrument is now, but I had the opportunity to see the oboe when it was for a short time in the Haags Gemeentemuseum). I have taken measurements of it, and Piet Dhont has played the instrument together with other Richters' oboes, in a recording session for the preparation of the new Catalogue of Dutch Baroque Doublereed Instruments of the Haags Gemeentemuseum (will be published in 1995, let us hope).
Because the boxwood oboe played so well I was interested in the other boxwood instruments by Richters, and therefore I have done some research into the two other boxwood oboes in London and Oxford. I am grateful to Margaret Birley and Jeremy Montagu for their permission and help for my investigations!

Short description of the instruments

1- Private collection, Netherlands.

Oboe in c1, European boxwood, unstained, originally light yellow colour, but now brownish (resulting in the colour of yew wood), caused by recent impregnating with oil. Keys made of brass. On silver mount, loosely fitted around the bell rim. On this mount on the middle some decorative flower patterns, and and the sides 48 and 57 little teeth. Two other rings (silver or ivory?) on the socket rims of the middle joint and the bell are now missing (see drawings). The holes for the key axles are drilled through the wood (not ending blindly). Some cracks in the bell joint are repaired, there is no further serious damage. The quality of turning is excellent, with a good "expressive" profile and an excellent finishing of the smaller details. I is a pity that the two rings at the sockets are missing, it detracts from the beauty of the instrument.
All fingerholes are drilled straight (with an angle of 90°), or almost straight. The holes 1, 2, 3 and 4 are only slightly undercut, holes 5 and 6 are moderately undercut.
The instrument plays well at about a-415 Hz, wit a good and easy f1 and also good other fork fingered notes in the lower register (and that is the difficult register on an oboe). The d#1 sounds somewhat low, it is more d# than e_b.

2- Bate Collection, Oxford, England. Code: 2040

Oboe in c1, European boxwood, stained dark brown. Keys made of brass, the upper part of the c-key probably not original, this because the shape of the wings (narrow) and the thickness (1.4 mm, what is rather thick). The key axles (brass) are also thick and are protruding rather far out of the blindly drilled key axle holes, and are bend strongly at the end. On the lower key-ring a piece of wood is broken out, may be caused by forcing the axle into the hole. I don't think that the axles are original.
A simple silver ring with teeth on the sides is mounted on the bell rim. An ivory mount on the bell socket is probably not original, because the ring is turned rather excentric.
There is some damage visible on the instrument: at the sides of finial on the upper joint pieces of wood are broken out, and there is a crack at the right side of the baluster. In the bell four long cracks are visible, at the end of the bell some pieces of wood are broken out of the inner bell rim.
The bore of all joints is very smooth, the fingerholes are drilled almost straight, hole 1 slightly up. The holes are only slightly to moderately (5 and 6) undercut. The d#-holes are relatively small.
The quality of turning is very good, with again a nice expressive profile. "Expressive" means for me: a well balanced combination of concave (nice curves) and convex (strong "tops") elements, with perfect finishing of the smaller details.

3- Horniman Museum, London, England. Code: 14-5-47/120

Oboe in c1, European boxwood, stained and varnished dark brown. The wood of the top joint has a strong flame. The bell is not made by Richters, but is stamped P.BORKENS, a woodwind maker who lived in Amsterdam (1693-1765). The finial of the topjoint is a repair, it is a loose piece of wood fitted on a ferrule. The upper two joints are crooked to the left. Except a crack at the side of the baluster (top joint) and some smaller chips of wood broken out of the finest rings, there is no serious damage. The quality of turning is again very good, only the surface of the "columns" (the smooth turned parts where we find the fingerholes) is now irregular and crooked, maby caused by the wild grain of the wood. Fingerhole 1 is drilled under an angle (upwards), hole 4 slightly. Hole 3 is drilled slightly downwards, hole 2 very slightly downwards. The other holes are drilled straight (90°) on the wood. The holes are only slightly to moderately undercut.

About the bore: the bore of the top joint is rather coarse, corresponding with the structure of the surface of the wood. The keys are made of brass, the axle holes are drilled through the wood.
I believe that Philip Borkens repaired this instrument himself. The colour of all joints is so much the same, also of the new piece of wood on the finial. The design of the bell however is different from Richters' bells: the new bell is much longer, with the vent holes placed high, and the name of the maker stamped between the vent holes. The design is almost identical with the bell on one of the oboes made by Thomas Boekhout (Haags Gemeentemuseum, Code Ea 16-x-1952), and I have never seen this type of bell on other baroque oboes.

Typical features of Richters' oboes

Design and turning

About the design (the profile): Richters turned short and small finials on these three boxwood oboes. On most of his ebony oboes however, he made longer and widely flared finials (of ivory), with a cup at the top. That gives a complete different look at the instrument, whereas the internal design (the length of the bore) is the same. The only other instruments with such widely flared and cupped finials I have seen were made by Haka and Rijkels, all relatively short oboes, may be in the old 17th cenury pitch (a close to 440 Hz), and perhaps designed with such long finials to have better proportions.
The joints of the three boxwood Richters' oboes have about the same lengths, but there are more important differences in the partition within the joints, the relation of the columns and the rings and baluster (see drawings).
The shape of the key-rings is always the same: the upper key ring (with the grooves for the c-key and both d#-keys) is flattened at the top, the lower key ring is rounded. Between these two rings there are no smaller turned rings (as on oboes by Haka, Rijkel and Beukers).
The quality of turning of Richters is very high, he was one of the few woodwind makers who could turn ebony wood very well. I have seen that some ebony instruments by other makers (Boekhout) were sanded heavily, I suppose to cover up turning faults. The result is that all fine details are very rounded.
On boxwood (and on ivory) it is much easier to turn sharply defined details, and so we see on the three boxwood oboes. Some details are so fine and thin that they are vulnerable, that's why we see here sometimes some damage (chips broken out).
Characteristic for Richters is the shape of the socket bulges (in German language, there is a much better term: "Wulst", this word reminds me also of beautiful women and old timer cars...), with the typical contraction (concave slope).

Keys and key axles

On many oboes of Hendrik and Frederik Richters the axle holes for the key axles are drilled blind, that means that the holes are ending somewhere in the wood. It is therefore impossible to push the axle back from the other end. The holes are always drilled from the righthand side (seen from the position of the player). Such blind holes I have only seen on instruments made by the Richters' brothers. There are also oboes (such as the instruments 1 and 3) with normal holes (drilled through the wood), but it is not always clear if these holes were originally drilled blind, and were made longer later, at a repair action. Most original axles have a diameter of 1.1 or 1.2 mm.
Richters oboes are famous for the silver keys. However, I myself do not like these engraved keys always so much. The engravings are sometimes interesting, but no more than that. It looks to me that many engravings are done in a hurry, and also the shape of the (but not of all) keys is often irregular, not well

balanced. For me, the brass keys on the oboe in the Horniman Museum are much more beautiful. Perhaps they are not perfectly symmetrical on all places, but the design is strong and convincing, a pleasure to look at.

The bore

The design of the bore of the joints of the Richters' oboes is always very the same. Most characteristic are the middle joints, where the bore is from the wide (lower) end to about the the place of the d#-hole only slightly conical (from 16.2 to 15.4 on oboe nr. 1), and from that place towards the socket more strongly and almost straight conical, narrowing to about 11.5 mm. On the upper joint the bore is more or less the same: from the lower end up to about 40 or 50 mm (where is fingerhole 3) slightly conical (11.0 to 10.5), and then narrowing to about 6.4 (what is relatively wide) at the narrowest place. The other (ebony) oboe by H.Richters in the Bate Collection however is with 5.6 mm very narrow, but on that instrument the effect of "tenon contraction" is not impossible, caused by the ivory finial fitted here.
The bore of the bells of the Richters' oboes is less uniform. The widest opening on the two original bells were 40.5 (oboe 1) and 44.0 (oboe 2), quite a difference. The lower section of the bore of the bell is not only made by reamers, but is turned on a lathe. That means that the oboe maker is more free in shaping the corner and the space behind the low corner. All corners I have seen are identically shaped, just flaring without sharp edges (see drawings).

I don't know if Richters polished the bores of his instruments. I have seen many "chatter marks" and other irregularities (ridges in length direction) in oboe bells of other woodwind makers, but most bells (also in ebony wood) by Richters are very smooth. Sometimes some reamermarks (concentric traces) are visible and if these marks are not visible at all, polishing is very probably. But I am not sure about that.
Adkins has compared the bores of some Richters' oboes, but he is in his article rather unclear in using terms as "standard deviation", without giving information about his calculations and statistic technics. That is a pity, because it is interesting enough to compare the instruments of one maker, and to know what caused the differences.
The first important thing is: what do you want to know: the effect of the shrinking of the wood (boxwood may be more shrinking than ebony), the effect of polishing, the effects of tenon contracting, the effects of repairs and adjustments. In my opinion we can only group the (bores of the) instruments into clusters and then trying to find some reasons why the instruments are clustered as they are.

The bore of oboe 2 (from the Bate collection) is in the top and middle joint somewhat wider than oboe 3, oboe 1 being the narrowest. Is this because oboe 1 had shrunk most? The silver ring on oboe one is very loose now, and the ring on the bell of oboe 2 is fitting much better.

The fingerholes

I was surprised to see how Richters drilled and undercut the fingerholes on his instruments. On some instruments, all fingerholes are drilled simply straight, no angle at all. On most instruments, some holes are drilled with a slight angle, not just 90°, but 80 or 85° (holes 1 and 3 drilled slightly up, holes 3 and 6 slightly downwards). On very few instruments hole 1 is drilled more sharply at an angle (perhaps 60°, upwards). This type of drilling is perhaps not only done to have the fingerhole in an easier position for the finger; the hole becomes longer and the length of a fingerhole (and the way of undercutting) has influence on the sound and the relation between the main note and the fork fingered one on that hole.

About the double holes (on 3 and 4): I have seen on many Dutch instruments (not only by Richters) that the right of the two holes was placed somewhat lower than the left one. Often not more than 0.2 or 0.3 mm, and there was no difference at all in the size of the holes. Why?

About the undercutting: there is only one Dutch woodwind maker (Van Aardenberg) who made oboes with strongly undercut fingerholes. Most other oboes (including the instruments by Richters) have fingerholes only just undercut (holes 1, 2, 3 and 4), sometimes the lower holes (5, 6 d#, c, and the vent holes) are undercut moderately. But it is not clear for me why Richters has undercut on some oboes the lower holes distinctly more than on other instruments. I have to say: only in rare occasions there is an opportunity to do full measurements on the undercuttings. You need X-ray photo's, or an endoscope, or you must have permission (and time) to make imprints with dentists' plasticine.

About the drawings:

Writing this article I discovered that I was missing some measurements. Of course, for my research I do not need to know everything, but it is a pity that I can not give full information. But everyone who is interested can go him- or herself to the collections and see the instruments. About oboe 1, it is impossible (even for me) to see the instrument again, so I am sorry, I can not help you with more information.

Tips for making a copy:

It is relatively easy to make reamers for Richters' oboes. The shape of the bore of the joints is not complicated, and so is the reaming of the bell rim. The wide opening of the top joint (6.4 mm or more) allows us to drill a pilot hole with a 6 mm drill. It is much more difficult (and expensive) to make a bore of 5.7 mm, because in my local shop the 6 mm drill is the smallest one I can buy. Piet Dhont told me that he alters on some copies of baroque oboes the bore of the middle joint between the socket and hole 4; a relative narrow bore makes the f1 easier. Making the d#-holes bigger, the d# will sound sharper, but I do not know how that influences the b_b2.

Measurements

Fingerholes	(B x L)		
	oboe 1	oboe 2	oboe 3
1	3.0/3.1	3.0/3.1	2.9/2.9
2	3.4/3.6	3.6/3.5	3.5/3.6
3l	2.7/2.7	2.5/2.7	2.7/3.0
3r	2.7/2.9	2.5/2.7	2.7/2.9
4l	3.5/3.8	3.4/3.5	3.5/3.7
4r	3.5/3.5	3.4/3.6	3.4/3.7
5	5.0/5.3	4.5/4.6	4.6/4.8
6	4.7/4.8	4.4/4.5	4.4/4.6
d#r	c. 4.5	c. 4.1	c. 4.3/4.6
c	6.6/7.0	c. 6.2	c. 6.5
vent-l	4.3/4.4	?	4.7/4.9
vent-r	4.2/4.4	?	4.8/4.8

Bore top joint

From lower end

	oboe 1	oboe 2	oboe 3
Ø	L	L	L
11.4	-	0	-
11.2	-	.	0
11.0	5	10	3
10.8	11	.	16
10.6	17	.	35
10.5	37	55	.
10.4	43	.	62
10.2	52	.	69
10.0	59	77	74
9.8	67	.	81
9.6	72	.	82
9.5	77	94	.
9.4	80	.	93
9.2	92	.	101
9.0	96	109	102
8.8	104	.	110
8.6	110	.	117
8.5	112	122	.
8.4	114	.	127
8.2	120	.	131
8.0	127	132	132
7.8	130	.	137
7.6	138	.	148
7.5	140	152	.
7.4	143	.	155
7.2	144	.	157
7.0	150	164	163
6.8	157	.	176
6.6	166	->	179
6.4	->	->	182
6.2	->	->	->

Bore top joint, from top end (reed well)

Ø	L-1	L-2	L-3
8.7	-	0	-
8.4	0	-	-
8.3	.	.	0
7.8	15	.	9
7.3	23	.	22
7.0	.	31	.
6.9	29	.	.
6.8	.	.	29
6.5	45	.	.
6.3	.	.	42/->

Bore middle joint, from lower end

	oboe 1	oboe 2	oboe 3
Ø	L	L	L
16.7	-	0	-
16.5	-	44	-
16.2	0	.	1
16.0	9	66	5
15.8	26	.	10
15.6	76	.	40
15.5	.	105	.
15.4	82	.	30/92
15.2	86	.	98
15.0	92	126	106
14.8	101	.	110
14.6	110	.	116
14.5	.	142	.
14.4	115	.	125
14.2	122	.	132
14.0	127	155	145
13.8	134	.	152
13.6	139	.	158
13.5	.	167	.
13.4	146	.	164
13.2	150	.	?
13.0	157	182	167
12.8	163	.	183
12.6	169	.	185
12.5	.	193	.
12.4	175	.	190
12.2	179	.	198
12.0	186	201	202
11.8	190	.	204/->
11.6	199	213/->	->
11.4	211	->	->
11.3	->	->	->

Bore bell, oboe 1 (Ø/L), from lower end:
40.5/0; 42.0/5; 44.0/7; 46.0/12; 44.0/16; 42.0/19; 40.0/24; 36.0/31; 32.0/41; 30.0/45; 28.0/52; 26.0/58; 24.0/65; 22.0/72; 21.0/79; 20.5/84; 20.0/95; 19.6/103; 19.2/108; 19.1/just through.

Bore bell, oboe 2 (Ø/L), from lower end:
c. 44.0/0; c. 47.5/8; 40.0/24; 35.0/32; 30.0/41; 25.0/55; 22.0/69; 20.0/88; 19.6/100 and through.

Bore bell, oboe 3 (made by Borkens), (Ø/L), from lower end:
40.6/0; 43.9/c. 8; 40.0/17; 35.0/31; 30.0/44; 25.0/60; 23.0/68; 21.0/82; 20.5/98; 20.0/122 and through.

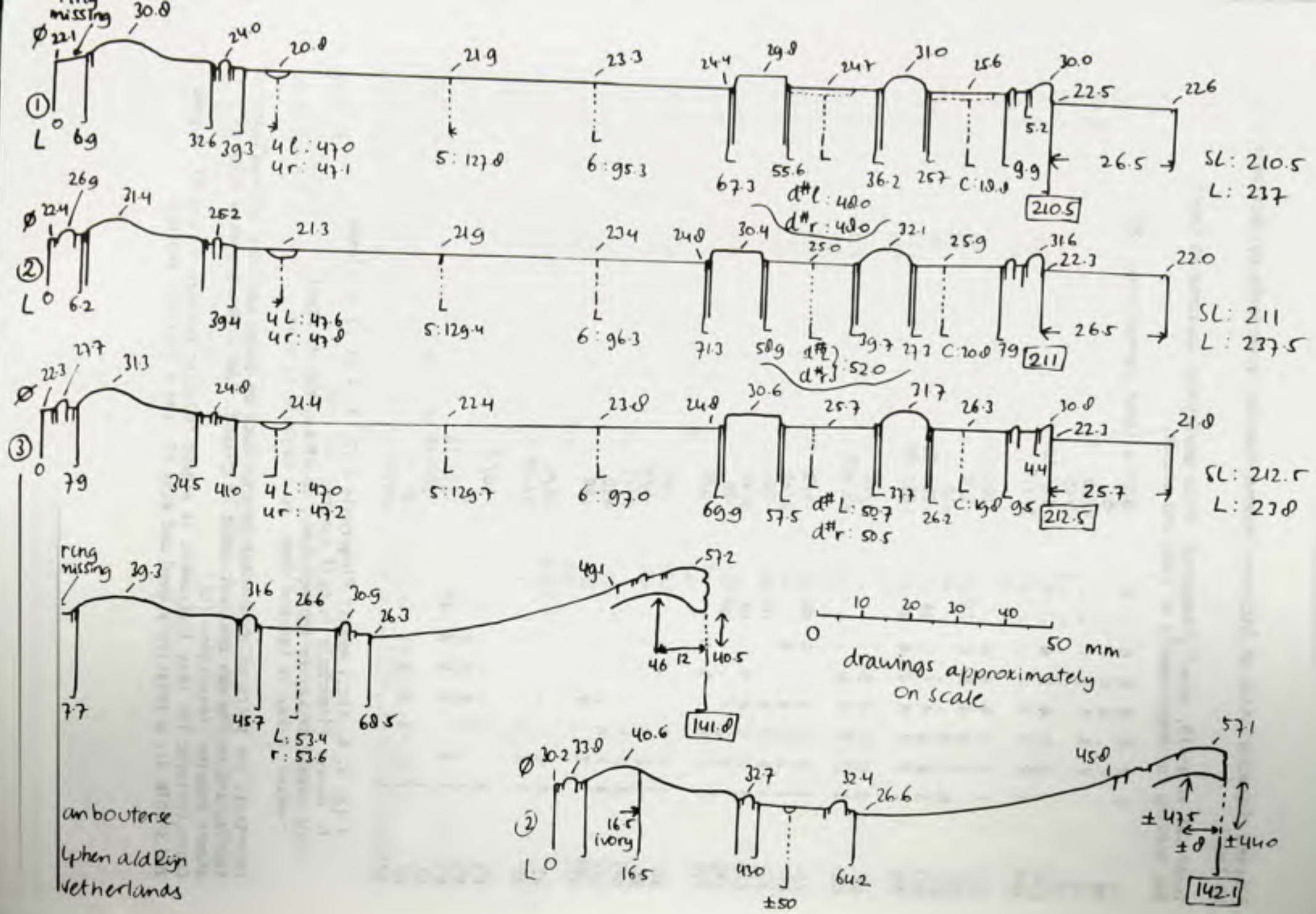
Playing characteristics of Richters boxwood oboe no. 1 (private collection, Holland).

Tuner set at a-415, equally tempered. Pitch deviations measured in Cents. See drawing for measurements of reed and staple.

c1	1	2	3	4	5	6	.	c	-5/0; without corrections: -20
c2	.	2	.	4	5	.	.	.	-5
c3	.	2	3	4	5	.	.	.	0/+5
c3	.	.	.	.	.	.	.	.	0/+5
c#2	.	2	3	4	5	6	.	c	-15/-10
c#3	h	2	3	4	.	.	.	c	0/+10
d1	1	2	3	4	5	6	.	.	-10/-5
d2	.	2	3	4	5	6	.	.	-5/0
d3	h	2	3	.	.	.	.	c	+10
d#1	1	2	3	4	5	6	d#	.	-30/-25
d#2	.	2	3	4	5	6	d#	.	-25/-20
e1	1	2	3	4	5	.	.	.	0/+5
e2	1	2	3	4	5	.	.	.	+5/+10
f1	1	2	3	4	.	6	d#	.	-5/0
f2	1	2	3	4	.	6	.	.	0/+5
f#1	1	2	3	4	.	.	d#	.	-20/-15
f#1	1	2	3	h	5	.	d#	.	0/+5
f#2	1	2	3	4	.	.	d#	.	-20
f#2	1	2	3	.	5	6	.	.	-5/0
g1	1	2	3	.	.	.	.	.	-5/0
g2	1	2	3	.	.	.	.	.	-5/+5
g#1	1	2	h	.	.	.	.	.	0/+5
g#2	1	2	h	.	.	.	.	.	+30
g#2	1	2	.	4	.	.	.	.	+40
a1	1	2	.	.	.	.	.	.	-5/0
a2	1	2	.	.	.	.	.	.	0/+10
b♭1	1	.	3	.	.	.	.	.	-10/-5
b♭2	1	.	3	4	5	6	.	.	0
b♭2	1	2	.	4	5	6	d#	.	-15/-10
b1	1	.	.	.	.	.	.	.	-20/-15
b2	1	.	3	4	5	.	.	.	0
b2	1	.	.	.	.	.	.	.	-5/+5

1 (2, 3, 4, etc.) means: fingerhole 1 (2, 3, 4 etc.) is closed
h means: fingerhole is half covered
d# means: d#-key is touched down, so d#-keyhole is open!
c means: c-key is touched down, so c-keyhole is open.

Important: the pitch of oboe-tones depends much on shape and size of reed and staple, and on the way the instrument is played. Some tones are very stable, others require corrections (c1).
Characteristic for this instrument is a good relation between b♭1 and b1, a good and stable e1, a relatively good and easy f1, and a flat d#1 and d#2.


ring missing
SL: 210.5
L: 237
SL: 211
L: 237.5
SL: 212.5
L: 238
ring missing
drawings approximately on scale
0 10 20 30 40 50 mm
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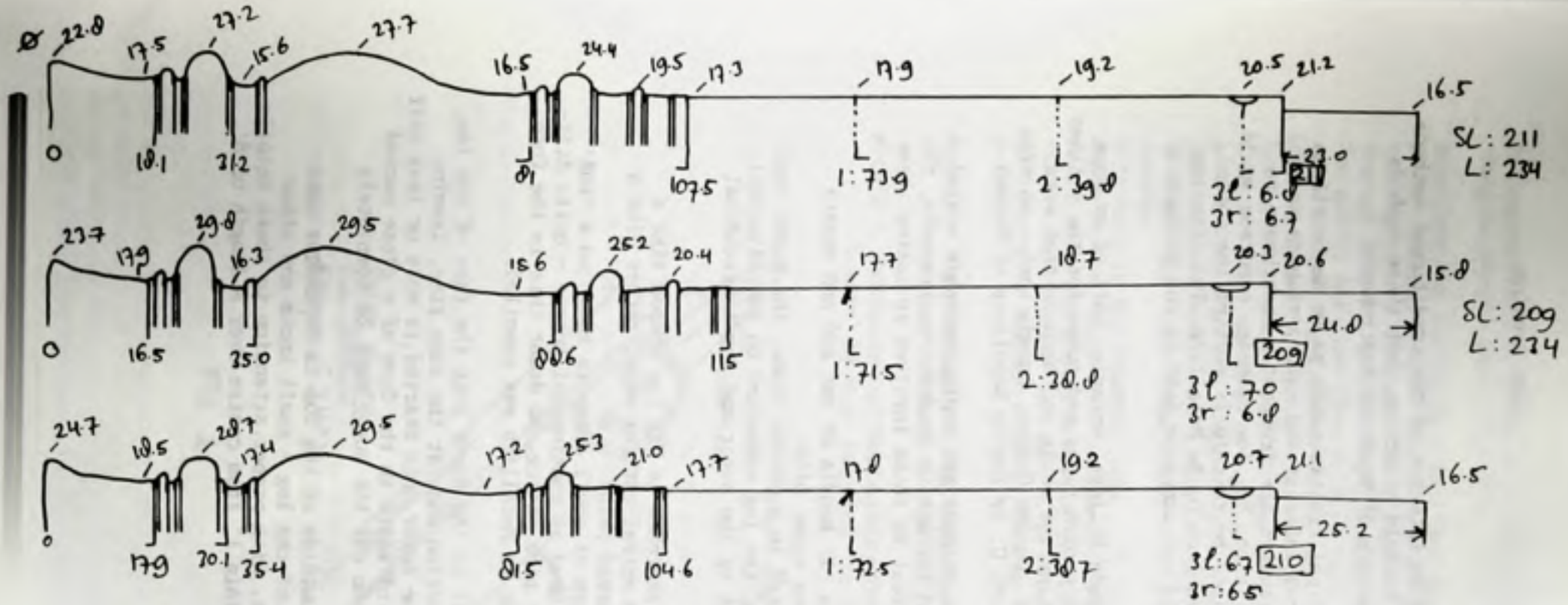
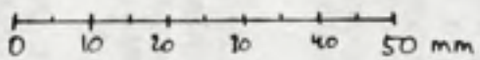
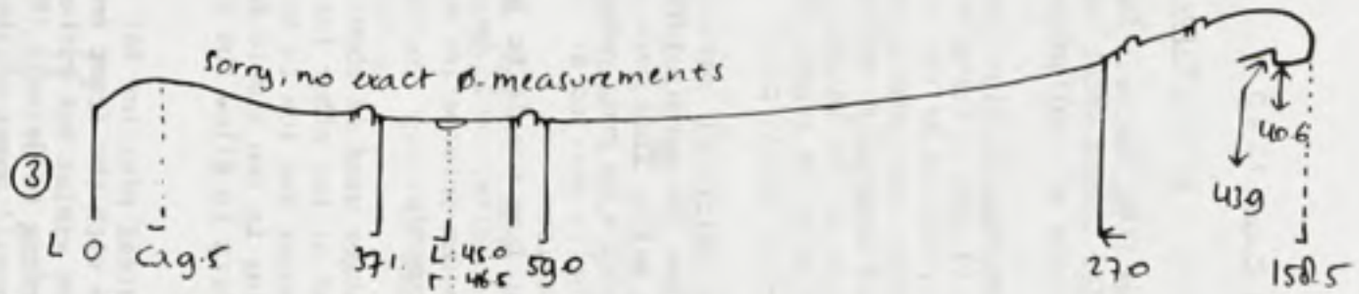
Netherlands

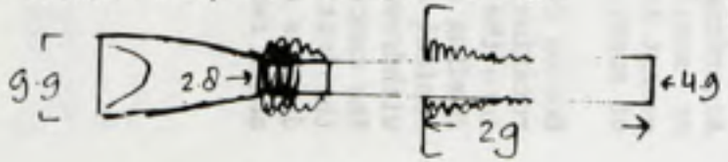


3 boxwood oboes by H. Richters upper joines





reed and staple, used for oboe ①



this bell is made by P. Borkens

FoMRHI Comm. 1260 John Downing

Woodwinds - Boring Pipes

In Comm 1199, Michael Ransley expressed an interest in the traditional methods used for boring water pipes and musket barrels believing that these methods might have an application in the manufacture of woodwind instruments.

The engravings illustrating early technical treatises such as De Re Metallica (Note 1), while being of great historical interest and value, require careful interpretation as the details in the drawings are frequently inaccurate to the point, sometimes, of being impossibilities. So, for example, a person would be hard pressed to make wooden water pipes by faithfully copying the tools depicted in the relevant engraving taken from De Re Metallica. The piercing auger as it is drawn, for example, would not function well in end grain with its screw thread point.

As an historical carpenter at Upper Canada Village, Ontario, part of my work involves the manufacture of replacement wooden pipes and pumps for the village water wells. This work is undertaken using the tools and methods that were applicable to pump making in mid 19th C. Dundas County, Canada West - an area originally settled at the end of the 18th C. by Empire Loyalists of German extraction.
Whilst I am unable to judge if the same methods and tools, suitably scaled down in size, could be effectively used for making woodwind instruments, the following information might be of interest to those involved in making these instruments.

The auger used is about 10' long with a 'T' handle at one end and square socket at the other for mounting various auger bits.
The auger and log to be bored are mounted in a wooden frame, the auger shaft resting in two simple half bearings and the log supported on two adjustable supports to allow the precise alignment of the auger and log longitudinal axes.

The steel piercing bit is of the form sketched in Fig 1 - shaped like a gouge with the front end forged into a spiral cutting edge, rather like a common gimlet but without the screw thread point.
According to Salaman (Note 2), this form of shell auger is known as a 'pod' or 'snail' auger of the type that was used in continental Europe - quite diff--erent from those used in Britain for pipe making. No doubt this is the form of auger used in Germany at the time De Re Metallica was compiled.

Boring commences by centering the point of the auger into the face of the log, rotating the auger in a clockwise direction and, at the same time, leaning into the cut with full body weight. The auger, once started, is more or less self feeding and produces a curious ribbon of waste in the form of a close packed conical spiral. Every 12" or so into the cut the auger must be completely withdrawn to clear the waste.
The concentricity of the bore to the outside of the log is dependent upon the initial alignment and the quality of the log - small knots and other defects can cause the auger to deflect. With proper attention to these details auger run out can be maintained to within 1" from centre over a length of 8'.

Enlargement of the pilot hole when required, is accomplished with reamers - -conical shaped shell bits with either straight or spiral cutting edges.

Regarding the boring of musket barrels, as far as I am aware musket (and rifle) barrels used to be made from iron pipe - the pipe being made by forge welding strips of iron over a mandrel or by piercing a solid iron billet and drawing it down to the required diameter through a series of reducing rolls. The barrel bore was then enlarged and finished by reaming - multi spiral reamers being used for enlarging the bore and straight bladed reamers for finishing smooth. This process is, of course, much easier to do than that of boring out a solid chunk of iron.
I do not know the history behind the development of gun drills but would assume that they are a fairly recent development originally designed for drilling out high power rifle barrels from solid ordnance steel, presumably to avoid the flaws found sometimes in barrel blanks made by the traditional methods.
According to Rod Cameron (Comm 197, Bulletin 15), gun drills are very fast and accurate when used for making woodwind instruments but are expensive and really only suitable for mass production work in large workshops. He describ- -es the fabrication and use of an effective alternative based on a design used by early bagpipe makers. Perhaps a reprint of this Comm. would be of interest?

Note 1 - 'De Re Metallica' by Georgius Agricola, Trans. Herbert Clark and Lou Henry Hoover, Dover Publications Inc, New York.

Note 2 - 'Dictionary of Woodworking Tools c 1700 - 1970 and tools of allied trades' by R.A. Salaman, The Taunton Press, U.S.A.

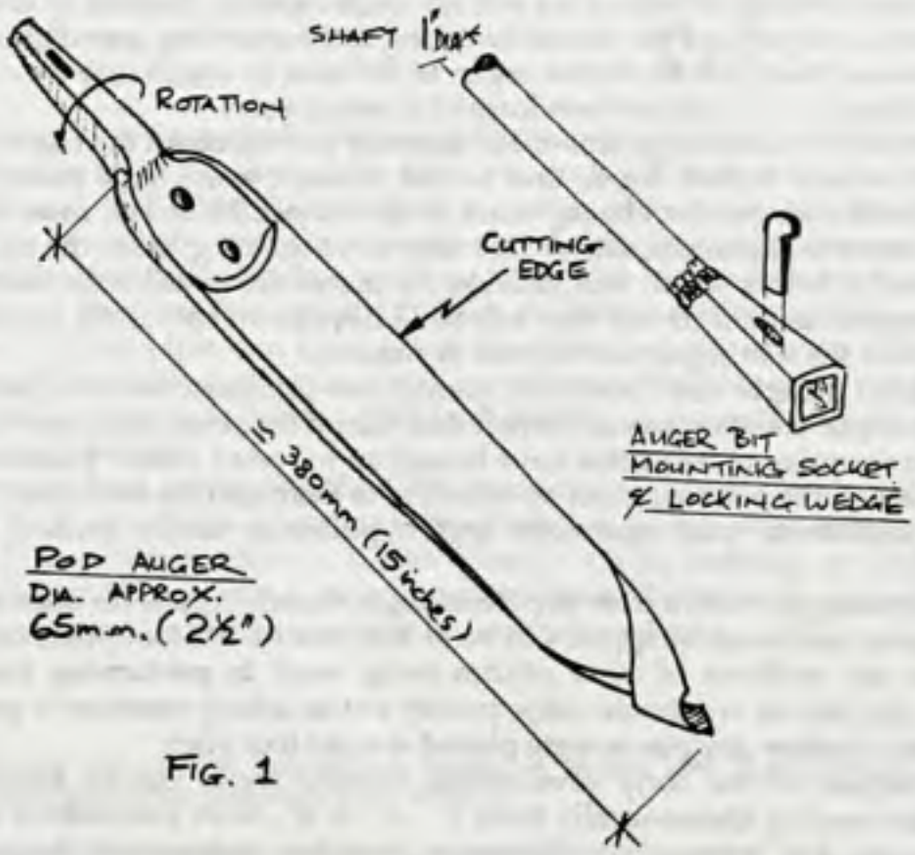


FIG. 1

The Transposing Organ and Choir Pitch in England: answers.

1. Pitch relationships:

Organ	10' c	10'g	5' c	5' g	$2^1/_2$' c
Choir	16' f	8' c	8' f	4' c	4' f

2. a) Reproducing 5ft pitch on an 8ft stop, transpose up by a fourth.

   b) Playing at Choir pitch (8ft) on a 10ft stop, transpose up a fifth.

3. If the organ has a meantone tuning with unusable keys of B, C#, F# and Ab, the choir can be accompanied in Ab, but not in E.

As may be obvious, the questions are directed particularly towards performers. It has been a concern of mine for some years that the early English organ is little understood, and it is easy to see why when reading through the literature of the past few years: despite abundant explanations, answers to the above questions will depend on which one was referred to. Peter le Huray correctly describes the relationships in 1967 and 1992[1], though he goes on to say that the top note of a 5 foot rank is 'just above the top note that a treble was ever required to sing', and even Stephen Bicknell has us transposing up a fourth on the 5' and down a fifth on the 10'[2]

The performance of British organ music of the period has been virtually non-exixtent until recently, and has been taken more seriously on the continent than in this country, not surprisingly since there are instruments there that are far better suited than anything here. British organists now seek out suitable instruments abroad for broadcasts, including Nicholas Danby at Basel, Paul Nicholson at Lanvellec and David Sanger at Amsterdam. Given something approaching the right sound on a well made or restored organ that has an appropriate tuning and where the building makes its contribution, the music comes alive (for me, at any rate) when well played.

That these continental organs are still not quite right for Redford et al may have occurred to some, and perhaps we should be asking more searching questions about the differences between them and the British organ of the time, in which case we could make an assessment about how much has been learned in recent years.

There is now a fairly large amount of material written about the sixteenth and early seventeenth century British organ, and a read through some back issues of the BIOS Journal[3] provides an excellent background to the subject. However, most of this is concerned with records and music, and we are only just beginning to see the technical aspect examined, and it is this which will provide the means for possible reconstructions that will be attempted (as I am certain they will be - I have had a bet for the last ten years that the first modern ten foot organ will be built in America).

It has been thought that there is not enough pre-Commonwealth organ material left on which an organ could be based: Clutton and Niland list seven cases surviving, but it is surprising the number of items that have turned up in recent years. Technical details are not the subject of this pot boiler, but by referring to them and the secondary source material it is possible to pose questions and hypothesise about matters pertinent to performance.

The surviving pipework from pre-Restoration church organs (as opposed to the few extant chamber instruments) appears to be at five foot or ten foot pitch, and I have not come across any evidence of other pitches being used. In performing liturgical organ music from this period, we should consequently not be asking whether to perform at five foot pitch, but whether any pieces were played at eight foot pitch.

The compass of the early seventeenth century organ can be fairly confidently proposed[4] as running chromatically from C - c^3 or d^3, from contracts or from Butler[5] who also gives this information. However, chamber instruments frequently, if not invariably, have a low AA played from the C# key. I suggest that those pieces which include that note must have been performed at eight foot pitch (the surviving chamber organs of the period appear to be at eight foot pitch, with the possible exception of the Dean

Bargrave instrument). The compasses given in the early sixteenth century are for twenty-seven naturals and (at Holy Trinity, Coventry) nineteen sharps, with C as the lowest note. This gives a chromatic compass of C - a^2.

Now as a practical consideration, I would like to suggest that all church organs were tuned in some form of meantone temperament until the eighteenth century (and most still were well into the nineteenth century), and that there was consistency in the position of the unusable keys. This means that the usual unusable keys mentioned in the third question are related to either the organ pitch or the choir pitch, but not both. From very limited experimentation, I suggest that the organ had the usual tonality: pieces that sounded fine as written had some sticky moments when transposed. It should also be noted that by playing on the twelfth (if available) an octave down, one is 'unison to the voice' *and* it is possible to accompany in e. Whether the choral music fits in with the theory is a subject more ably pursued by a musicologist.

It is useful to concentrate on the relationships between organ and choir pitch in order to get a clear understanding of the implications of temperaments, etc., so the question of absolute pitch has been left until now. Estimates of the pitch level of sixteenth and seventeenth century choral music have been the subject of continued interest for many years, and a minor third higher than todays level is widely accepted. The front pipes at Stanford on Avon had their pitches measured by Dr Charles Padgham in 1982. Recent research by John Harper[6] has established that this organ was the chair to the Tewkesbury case when it was at Magdalen College, Oxford, and internal evidence supports this view. By examining the documentation and relating it to the organ, we find that when Renatus Harris rebuilt it in 1690 three pipes in the bass were made redundant through conversion from a chromatic five foot stop to a short octave four foot stop. These pipes have no eight foot pitch markings, the mouth heights are noticeably lower than their neighbours, and the lengths look unaltered. The following table lists some particulars:

Organ pitch	Choir pitch	Actual pitch (where a = 440Hz)
D	G	G# + 25 cents
E	A	A# + 38
F	A#	B + 33

Establishing a precise pitch level from these pipes is unfortunately not possible: slight deformation and corrosion of the metal preclude 100% accuracy, the values above confirming this, D to E being 213 cents where we might expect it to be less than 200. However, there is enough consistency to say that the pitch level in a musically very important establishment was between a semitone and a tone higher than modern pitch[7].

The tone of these organs is more difficult to define, and beyond the scope of this article. Robert Dallam pipes can be heard at Lanvellec, but it is smaller than a five foot organ, and the 80mm wind pressure seems surprisingly high for (relatively) low cut-up voicing. I would suggest that Italian or Iberian[8] organs are closer in sound to the Dallams than the Teutonic varieties.

We have just been celebrating the 450th anniversary of Byrd's birth, and the 70th anniversary of Byrd recordings. In recent years there has been a blossoming of interest in sixteenth and seventeenth century British Church music keeping up with the latest recordings is beyond the pocket of most organ builders. The ten foot organ is an integral part of this music, and I hope that one will be heard some day.

Notes.

1. Peter le Huray: *Music and the Reformation in England*, H. Jenkins, 1967; *Organ pitch and organ accompaniments in Elizabethan and Jacobean church music*, BIOS 16

2. Stephen Bicknell: *The Transposing Organ*, BIOS Journal 9, p.80

3. See also J. Bunker-Clarke: *Transposition in Seventeenth Century English Organ Accompaniments and the Transposing Organ*, Detroit, 1974; *Ephraim Segerman: English Organs and Transposition Skills*, FoMRHI

4. But don't take my word for it. There may have been ten foot organs with an AA on at least one manual: this note is occasionally found in accompaniments transposed down a fourth (Bunker Clark, p. 46), and there is ambiguity in the 1665 Agreement at Winchester, 'whose pitch is to be Gam ut in D sol re...' 'the biggest pipe conteyning thirteen foot in length..'

5. Charles Butler: *The Principles of Musik*, London, 1636 (Da Capo, 1970)

6. John Harper: *The Origin of the Historic Organ at Stanford-on-Avon: Connections with Magdalen College, Oxford, and the surviving Dallam case at Tewkesbury Abbey*. Organ Yearbook Vol. XXIII, 1992.

7. How widespread this pitch was I am not in a position to say. Contributions to the FoMRHI Quarterly present a bewildering variety of pitches in England in the seventeenth and eighteenth centuries.

8. There appear to be many connections between England and Spain/Portugal waiting to be researched, e.g. recommendations that one of the Escorial organs be tuned a 4th below the others, in 1587 (*Early Music*, February, 1994, p.180).

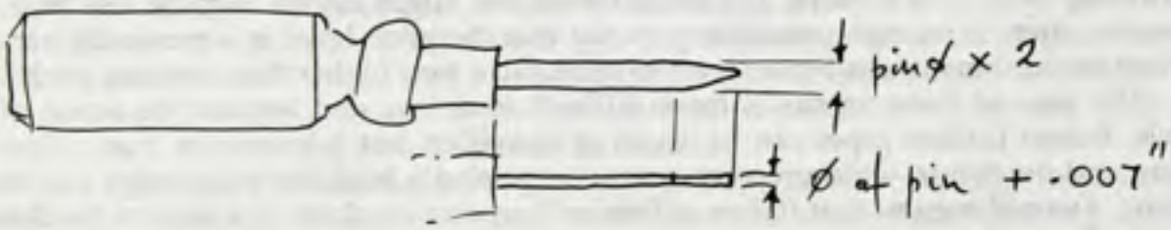
FoMRHI Comm. 1262 **Selway Robson**

Key Lever Fulcrum Pin Mortices

Just in case anyone out there in the first world still makes these with a chisel, here is the easy way to do it:

Use an old chisel as a punch, with the tip ground as shown below. The cutting edges should be square and sharp, but the tip is rounded so as to follow the pre-drilled hole in the key.

I have just made a copy of an 18th century organ pedal board, using piano-size fulcrum pins; the levers 3/4" thick, the holes close to the ends, and the punch works perfectly.



FoMRHI Comm. 1263 Rémy GUG

UN THE WINGS OF THE MUSE

or

Songs of Historical Feathers

Michael Cole's communication (Comm.1230) on Harpsichord Voicing is written by someone who has a great experience in this field. That gives me the opportunity to publish here a little series of old documents dealing with the theme of quills, or more generally, feathers in early times. We shall soon discover in the quotations from the following sources that the Ancients were very familiar with this natural product - and in consequence had much experience with it - a situation which has drastically changed since. Feathers, from the small to the great ones, from the soft to the hard ones, were often used in everyday life of that time, hence a great amount of experience could have been gathered over the centuries in this area.

In 18th-century France - to take one example among others in Europe - feathers were widespread consumer goods : "Les Plumes de certains oiseaux sont en France, particulièrement à Paris, un très grand objet de commerce", writes Jacques Savary des Brulons in his "Dictionnaire Universel du Commerce..., Copenhague, 1762, <vol.IV, col.237>. He continues mentioning seven different specialized crafts using this product. As usual in the economic organization of the "Ancien Régime", each craft had to follow precise regulations and was thus restricted to make only use of the kind of feathers it was allowed to work with and sell. Among them, the "Marchands Merciers-Papetiers vendent les Plumes d'oye, de cygne & de corbeau" <ibid.>. The French harpsichord makers, at least in Paris during the 18th century, had to go to the haberdasher-stationer's shop to get their raven quills. This is, for us, an interesting hint for further archivial researches. In passing, it will be noted that in this same shop they could get their music wire.

Raven in early printed sources

The use of raven quills on plucked keyboard instruments is attested to by many writers as early as the end of the 15th century. Julius Caesar Scaliger, born in Italy in 1484, published many works in the humanistic tradition of his time. Together with translations of important writings of some Antique Greek authors, he elaborated the work for which he is still wellknown in Renaissance literature history : "Poetices libri septem", published posthumously in 1561. His Chapter XLVIII, "Lyricorum Harmoniae & Instrumenta" <p.125> deals with what we would call today a history of musical instruments; as befits for a Renaissance humanist, only antique or mythological intruments are mentioned. Excepted a small digression where he is referring to what he saw in his youth in Italy : "Addite deinde plectris coruinarum pennarum cuspides : ex aereis filis expressiorem eliciunt harmoniam, me puero Clauicymbalum & Harpichordum nunc ab illis mucronibus Spinetam nominàt." <p.127>. By the way, we learn that, according to Scaliger, plucked keyboard instruments, voiced with raven quill, could be at first -in "his youth"- designated by two different terms ("clavicymbalum" and "harpichordum") before that, in the first half of the 16th century, they

appeared under the unique term "spineta"; the origin of that designation, always according to Scaliger, is explained by the "pointed" form of that kind of instruments.

Two years before Scaliger died, i.e. in 1556, the duchess of Ferrara bought different items for her musical entertainment. In the "Dépenses de la Duchesse de Ferrare" published - unfortunately without further references - by Victor Gay in his Glossaire archéologique du Moyen age et de la Renaissance, Paris, 1887, we read : "Pour plumes pour acoustrer les espinettes de Madame 3s. - Par le commandement de Madame, pour une petite espinette, 13l. 12s. - Pour cordes pour garnir lad. espinette, 4s. f°42." <vol.1, p.653>. As no quantity, either for the quills nor for the wire is mentioned, we cannot get a precise idea of the prices of these items in relation to each other. (Following Scaliger, the terms "espinettes" employed here by the author of these accounts refer probably to what we call "harspichords" today).

After the poets and the accountants, another humanist, whose name we met in an earlier communication (F-Q.67, p.39), Pierre Belon Du Mans, following the aristotelian tradition of decribing the world around him, published his "Histoire de la Nature des Oyseaux, avec leurs descriptions & naifs portraicts retirez du Naturel", at Paris in 1555. The "Sixième Livre" begins with the chapter on the "type Corbin", the first of which is the "Corbeau", also called in 16th century France by the "common people, Colas, [since] the early Greeks called it Corax, owing to its cry" <p.279>. After different literature references in Antiquity, our humanist gives a precise description of the raven, ending with an engraving which I reproduce here :

Corax, en Grec, Coruus en Latin, Corbeau en François.

Κόραξ ὁ μὲν ἀλκυὼν ἀλλ' ἀλκυὼν εἰκόν πλανᾶται δὲ τῷ ἀλκυόνῃ κόραξ. διὸ βοᾶται τὸν τοιοῦτον ἀυτῷ. τὰς δὲ κόραξ ἡ τέτραξ ἡ πέρν. Arist. lib. 9. cap. 1. & 31.

Finally, enumerating the different "uses" of the raven in commerce, Pierre Belon Du Mans does not forget that "les pennes seruent à faire des touches pour frapper les cordes d'espinettes, & aux artilleurs pour empéner les traicts". For music and...war...! To the type "corbin" classified in his "6th Book" belong also five other birds: "la Grole ou Freux, puis la Corneille noire, la Corneille emmantelée, & la Chouquette rouge, & puis la noire." From Pierre Belon it seems that quills from the other members were not used in Music.

This knowledge can also be gained from a work on the same subject published two centuries after Pierre Belon : Johann Leonhard Frisch, Vorstellung der Vögel Deutschlandes, Berlin, bey Fr. Willh. Birnstiel, 1763. His "sixth Class" is also devoted to the "Corvus" family, at first place again our "Corvus maior, der Rabe, le Corbeau". Frisch specifies that raven, at least in 18th-century Germany, were eagerly hunted by the country people, not only because they were harmful to other animals but because their feathers were requested for the musical instrument trade : "Der Rabe wird geschossen, nicht nur um des Schadens willen, den er den Hasen, Rebhünern, Fasanen, u.d.g. thut, sondern auch wegen seinen Schwung-Federn, deren Kiele man zu denen musikalischen Instrumenten, als Flügel, u.d.g. braucht" <s.p.>. It would be interesting to know more about the organisation of this specialized trade : the whole route of the raven quills from the peasant's hand to that of the harpsichord builder.

In 18th-century Germany, ravens were shooten down. In 17th-century England another process was in use to catch this kind of animals. In his "Mystery of Art and Nature", London, 1635, John Bate mentions "A Way to catch Crowes : Take the liver of a beast, and cut it in divers peeces, put then into each peece, some of the powder of nux vomica; and lay these peeces of liver in places where Crows and Ravens haunt. Anon after they have eaten them, you may take them with your hands, for they cannot fly away" <p.257>. If Bate indicates this technique, we may assume that people in his time needed to know how to diminish the number of crows and ravens in his country.

In some regions in Europe, the number of these latter was so high, during the 18th century, that a special law had to be instituted. In the "Berlinische Sammlungen zu Beförderung der Arzneywissenschaft, der Naturgeschichte...", Berlin, 1776, we learn that on the Danish Islands, each inhabitant had to deliver a given number of raven heads each year : "ein Gesetz, vermöge dessen die Einwohner verpflichtet sind, alle Jahre bey Strafe eine gewiße Zahl Rabenköpfe zu liefern" <vol.VIII, p.360>.

The Ancients had great imagination (also) in this field. Another trapping process is described in the "Nützliche Sammlungen vom Jahre 1757", Hannover, <III, p.527>. The peasants had the idea to put small rusted nails or needles into beans, that were thrown onto the fields where the undesirable raven or crows were living. The author of the article explains that, as the throats of these birds are very large, though their intestines rather narrow, it is easy to see what will happen when the hungry animals have eaten lots of these baited beans.

In France, at the same epoch, three other processes to catch ravens and crows were in use, but it would, first be to long to give a full description here, and secondly, as the two engravings in Noël Chomel's "Dictionnaire Oeconomique..." Commercy, 1741 <vol.I, p.215> show clearly, this kind of bird trapping would be forbidden today. (Using such a process would trigger off stronger reactions in F-Qs than those in the ivory-question. No need for us to "copy" the Ancients in this case ! Authenticity has its limit.)

To come back to Frisch's classification, the other members of that 6th. family are : "II) Cornix nigra, Schwarze Krähe, Petit Corbeau - III) Cornix s. Corvus Cinereus, Graue od. Nebel-Krähe, Corneille - IV) Cornix varia, Bunte od. Scheckige Krähe - V) Monedula, Graue Dohle, Choucas - VI) Monedula nigra, Schwarze Dohle, Spermologus s. Fragilega." As was the case with Pierre Belon, Frisch also does not mention that quills of these other members could be used on musical instruments.

Shall we conclude from these sources of early "natural history" that only raven quills were put into the harpsichord tongues ?

Were other kinds of quill in use ? With the puzzling remark made by the English Encyclopedist E. Chambers we are left unsatisfied : "Raven, Corvus Corax - The quills of Ravens are used in tuning the lower notes of a harpsichord, when the wires are set at a considerable distance from the sticks" <Cyclopedia, or an Universel Dictionary of Arts and Sciences, London, 1786, vol.IV, s.p., "Raven">. When raven was used in the bass, what was used in the treble ? This remark looks like that of Talbot quoted by Michael Cole.

Another source, published in the year 1600, speaks of goose-quill. Olivier de Serres was a French protestant Deacon who in his domain "du Pradel" in south of France experimented much in agriculture. During the reign of Henri IVth he wrote three great works where he explained his revolutionary ideas in that field. In his "Theatre d'agriculture et mesnage des champs" (1600), Paris, 1804, speaking about the geese (book V., ch. 5) he writes : "L'on assortit les plumes d'oyes selon ce à quoy on les destine, pour les licts, pour escrire, pour les espinettes, pour empenner les flesches, et pour autres usages" <p.338> [my italics]. The art of sleeping, writing, music, war and others...!

We may assume that early harpsichord makers had to rely sometime or in some regions upon goose quills when raven quills were hard to obtain (or for any other reason).

Writing pens

Goose quill was an universal means for writing at that time. But the great talent for observation in early times had shown that each kind of feathers available among the whole population of birds could have its specific use - as was the case for example with the different species of wood or with the different sorts of metals and so on. Johann Georg Krünitz makes a clear distinction in the uses of quills for writing. Some are well suited for writing on parchment and thick paper, others (raven) for artistic drawing and so on, the goose quill is best for common writing : "Mit den Straußen- und Schwanenfedern pflegt man insonderheit auf Pergament oder grobes Papier zu schreiben, gleichwie die Rabenfedern zum Feinschreiben und Reißen oder Zeichnen, die Gänsefedern aber zum ordentlichen Schreiben gebraucht werden" <Oeconomische Encyclopädie, oder allgemeines System der Staats- Stadt- Haus- u. Landwirtschaft, Berlin, 1777, vol.12, p.400>.

As usual in early society, the people had choosen from nature the product that could best fulfill their needs. If this was not naturally the case, they tried to attain their goal using an "artifice", as we shall see soon. Secondly, contrary to what happens in our civilisation, at that time no product was thrown away in the dustbin if it could be used elsewhere. This leads me to the following hypothesis : would a recycling of worn writing-pens (goose, raven or other ones) be considered in our case ? This was technically not a problem since the harpsichord quills are made from the part that is of no use for the

writing-pen. Let us consider this hypothesis seriously. If writing quills were recycled into harpsichord plectra, then it would be interesting to have a closer look to the treatment the writing pens underwent.

"Dutch pens"

Chambers informs us : "Dutch pens are those made of quills which have been passed through hot ashes, to take off the grosser fat and moisture thereof" <vol.III, s.p., "pens">. As writing quills have practically disappeared from our daily life, will shall probably encounter some difficulty in fully grasping all what the following quotations will try to teach us.

A great problem the Ancients had with writing quills was the appearance after a short time of "teeth" on the "split" of the writing pen, hindering thus the free flow of the ink. This seems to have been a great inconvenience, for which remedies were searched after. So I cannot give all details here, it seems that the Dutch artisans had been the first to find out a solution, kept secret as usual. "Dutch pens" were well known and very much in demand until the mid-18th century when the remedy became better known. The Berlin patriotic society willing to solve the practical problems of the inhabitants of its country, found it unacceptable to import great amounts of expensive "Dutch pens" while a lot of quills were available everywhere in the country itself. In 1772 the editor of the weekly journal "Mannigfaltigkeiten - Eine gemeinnützige Wochenschrift", <Berlin, 1772, p.367> asked for a solution to the "teeth" problem of writing pens. A anonymous writer who signed himself J. Ch. C. explains in his answer how these teeth can be avoided. The feather is first warmed over burning coals. Then the very thin skin on the upper part of the quill is scraped away under pressure with a knife. Finally the round form is reconstituted and the quill is polished :

> Man nehme die Federn ehe sie geschnitten werden, halte sie mit der linken Hand über glüende Kohlen, daß sie auf allen Seiten warm werden, lege sie auf ein Knie, oder auf einen mit einem Tuche bedeckten Tisch, drücke mit einem Messer in der rechten Hand den Bauch der Feder scharf nieder, und ziehe dieselbe alsdann nach sich durch. Hiemit gehet die Haut ganz los, und wenn man sie dann noch einigemal durch ein Tuch anhaltend durchziehet, so werden sie wieder ganz rund, und sind wie poliret.

The question of the Society recieved a second answer. After J. Ch. C., Johann Samuel Schröter replied with a long letter on the same subject. The process he uses is the same as the anonymous author. His description gives more details. The quills can be heaten up over the coals or, as Chambers says, in hot ash. Schröter however explains that attention must be paid to the right degree of heat : if too hot, the quill becomes limp; if not hot enough, then the quill cannot attain the required malleability and no hardening will follow :

> Selten wird die Asche die gehörige Wärme haben, sie wird entweder zu heiß, oder zu kalt seyn. Im erstem Falle, erweicht die Spuhle zu bald, und wird, statt daß sie hart werden sollte, zähe, und nun muß sie Zähne bekommen, da der Spalt keinen freyen Aufsprung haben kann. Im andern Falle erweicht die Spuhle entweder nicht genug, oder wenigstens durchdringt die Wärme nicht alle Theilchen der Schreibefeder, sie bekömmt daher nothwendig wieder Zähne.

As usual in early processes, the sensitiveness of the "fingers" are of prime importance : "und fühle mit meinen Fingern, ob sie durchaus erweicht, und zwar in einem gleichen Grade erweicht ist". With experience, it is possible, according to Schröter, to give a precise degree of hardness. For considerable hardness, scrape twice after having heaten up and cooled down the quill :

> Wer seine Lust an harten Spuhlen hat, der kann dieselbe gar zweymal ziehen, und sie das erstemal auf dem Rücken, das zweytemal aber auf der Seite überstreichen; nur muß dieses nicht gleich hintereinander geschehen, sondern die Feder muß zuvor erkaltet seyn.

We learn here an easy and simple method to master this natural heterogeneous product with which the Ancients seem to have been very well acquainted.

I took all this time with these writing-pen questions since my hypothesis leads me to the following suggestion : given, as I proposed above, that writing pens were recycled in harpsichord plectra, what would be the effect of such kind of treatment onto the behaviour of the quill in the jack ? I do not maintain that this actually was the case; no early source is known to me mentioning a recycling of this sort. I simply think that it would be worth experimenting in this direction, the more that such experiments are easy to make. Who knows what could be the results ? The Ancients are sometimes surprising...!

A historical method

After a hypothesis, we return to an early document published in the "Dictionnaire de l'Industrie ou Collection de procédés utiles dans les Sciences et dans les Arts..., Paris, chez Lacombe, 1786 <vol.I, p.[illegible]>. In this case, I tried over years the method given there, with the best results. In his article, Michael Cole mentions "lightly oiling" the plectra. From the following text - and my own experience - we hear that quills can be left in the olive oil over weeks and months :

Les plumes de corbeau employées aux ſautereaux des clavecins ont l'inconvénient de ſe caſſer en très peu de temps, ſoit par la ſécherelle qu'elles acquierent, ou lorſqu'elles ſont rongées des mites qui s'y engendrent, d'où naît une ſujétion gênante à repaſſer les inégalités des ſons. On a éprouvé que pour y remédier, il ne s'agit que de laiſſer tremper dans de l'huile d'olive les plumes que l'on veut employer. On leur ôte les barbes : on en coupe le plus petit bout, qui eſt ordinairement inutile, & on les met en paquets, la pointe en bas, dans un petit pot d'huile d'olive, avec une feuille de laurier au fond, ou gros comme le bout du doigt d'aloës, qui ſert toute la vie, même en changeant d'huile tous les ans. Quand on veut ſe ſervir de ces plumes, on les retire de l'huile, on les eſſuie bien ; par ce moyen elles ne ſont plus caſſantes, elles ont plus de reſſorts, & ſont exemptes de mittes ; elles dureront des années ſans être renouvellées : on en peut mettre une grande quantité à la fois dans l'huile : les dernieres qui y ſeront reſtées plus long-temps n'en ſeront que plus propres à l'uſage deſiré.

The translation of the paragraph in question:

The crow feathers used in the harpsichord jacks suffer from their tendency to break in a very short time, either by drying out or by being attacked by the mites who breed therein, thus leading to an untoward inequality of sound. It has been shown that this situation can be remedied by placing the feathers that one wishes to use in a bath of olive oil. The barbs are removed : the smallest end , normally unused, is cut off and they are placed in packets, the point facing downwards, in a small pot of olive oil, with a bay leaf at the bottom, or a finger of aloes and which will last for life, even when the oil is changed every year. When one wishes to use the feathers, they are taken out of the oil and wiped clean ; they will thus no longer be liable to break nor will they be attacked by mites but will be more resilient ; they will last for years without being replaced : a large number can be placed in the oil at the same time : those that stay in longer will be even better suited to the usage desired.

First we see that the Ancients were faced with a problem of which I never heard in our modern times : the mites attacking harpsichord plectra. Not only were the early people very different in many respect from ours, but obviously the houses where they were living seem to have had another degree of cleanliness than is the case today ! Was the early environment more friendly for all kinds of life opening out ?

Another point : what was the reason of the presence of the bay leaf or the aloes in the oil pot ? Could we see here perhaps an effective mean for preventing the oil from becoming rancid ?

As regard aloes, another reason could be evoqued in this context. Aloes, a juice from a specific tree growing in East Asia, was

well known in Europe since Antiquity. It was found in every early medecine chest (as can be the case today, specially in homeopathic medicine). Its greatest efficiency was its worm-killing action hindering the hatching of all kinds of larvas. The naval commmander and diplomatist Sir Kenelm Digby (1603-1665) mentions this effect in his "Experimented Receipts in Physick and Chirurgery...and others curiosities..., London, 1668 (posthumously publ. by George Hartman). The quotation from the German version <Frankfurt, 1676, II, p.290> : "Aloès tödtet, wegen des Überflusses seines bitteren flüchtigen Saltzes, allerhand Würme...". Did early mites so detest the bitter taste of Aloes ?

The mixture of aloes and oil was used as a treatment against the worms in the wood of ships. The "Recueil des Secrets à l'usage des Artistes" published mid-18th century in Paris gives a good account of the process : "mêler des feuilles de la plante d'où l'on tire l'aloès avec de l'huile et du suif [...] après avoir fait bouillir le tout ensemble, (c'est) un nouveau remède contre les vers à tuyaux. On sçait que l'amertume particulière de cette plante est un vrai poison contre toute sorte de vers" <p.33>. From these early texts it could seem that aloès was used in our "plectra-oil" to avoid the outbreak of mites. May another good effect on the plectra be added to this one ?

Beside all questions of high authenticity and great honnesty, I think it would be interesting, nay amazing, to take the above given quotations from early sources as a spring-board for experimenting with quills. Given our raven, our oil, our coals and our finger-sensitiveness... do not differ to much from their respective ancestors ! Cut, try and use... on the wings of the Muse !

(continuation from p. 75 Comm 1264 b)

3. The modern style of pedal keyboard with its concave radiating arrange--ment of keys did not come into general use until after 1881 when it was specified by the Royal College of Organists.
   The adoption of the new style of pedal keyboard by some reed organ manu--facturers did not take place until a much later date.

FoMRHI Comm. 1264a John Downing

The Canadian Vocalion - Part 1

The free reed organ has very early roots,going back to the Sheng in China, from at least the 11th Century B.C. The more familiar forms of reed organ - the harmonicas, concertinas, accordions, seraphines, harmoniums, melodeons etc -however, were a phenomenon of the 19th C being produced by the million at the peak of their popularity during the second half of the century.
The manufacture of these instruments was big business and early mass product--ion techniques were developed to a high degree within the industry.

The small parlour organs, popular for home music making were of two basic types. The earlier harmonium utilised a so called pressure bellows system, the reeds being housed within the wind chest and the air being expelled through the reeds to the exterior of the instrument. The melodeon, on the other hand, used exhausting bellows which drew air through the reeds into the wind chest producing a softer less harsh sound than that of the harmonium. Reed organs built using exhausting bellows were generally adopted by the North American makers and were later known as American organs eventually to be exported world wide.
The quality of these instruments ranged from well built, precision products of the finest workmanship to cheap junk.
Despite their popularity, reed organs never did gain the respectability affor--ded the piano in the status conscious society of the Victorian era being regarded as a poor man's instrument unworthy of 'serious' musicians and those of refined musical sensibilities. Nevertheless, a reed organ cost a third of the price of a piano and was more robust than a piano, the reeds not requiring tuning after leaving the factory and these instruments saw service across the globe finding their way into some of the more remote corners of the world. Music composed specifically for the reed organ was written by some of the more prominent composers of the time such as Berlioz, Strauss, Schoenberg and others.

The disadvantage of the American reed organ was that its subdued tones were easily lost in large halls and auditoriums and was , therefore, not really suitable for use in church. Many inventors of the era were engaged with the problem of increased and refined sound production using modified reeds and acoustic amplifying devices.
John Farmer (1836 - 1901), organist at Harrow,invented a stringed keyboard instrument the strings of which were set in vibration by free reeds. Farmer did not develop this musical curiosity further but a John Buchanan Baillie--Hamilton, recognising some potential in the beautiful sound made by this instrument, set out to develop it to a commercial reality.
The Vocalion as it was then called, did not live up to its promise tonally and was, furthermore, expensive to build. Baillie- Hamilton found that similar acoustic results could be achieved using broad reeds operating under high wind pressure combined with wind ways acting as amplifying chambers, principles invented earlier by a Hermann Smith of London. The use of reed actuated strings was then abandoned by Baillie-Hamilton and the first Vocalions were built by the firm of William Hill and Son, London between the years 1880 and 1886. Fewer than a dozen Vocalions were made by this company.

Baillie-Hamilton, seeking partnership with a North American manufacturer to build and market the Vocalion, probably in the early 1880's, worked for about two years with Charles S. Warren,(head of the Canadian company 'S.R.Warren & Son', Toronto since the death of his father, the company founder, in 1882). An agreement was entered into with the Mason & Risch company(of later piano fame but then primarily musical instrument distributors with outlets across Canada), to sell the Vocalion on the North American market.

It is not, at present, known for how long this arrangement lasted or for what period of time the Warren company continued to make the Vocalion or how many Vocalions were actually made by this firm.
In 1883/4, Baillie-Hamilton registered patents for a new design of broad reed presumably with applications to the Vocalion in mind. His address at that time was given as Boston Mass. and it is possible that his association with Warren had already ended by this date.

In 1885/1886, Baillie-Hamilton established a new company - the'Hamilton Vocalion Organ Manufacturing Co.' - in Worcester, Mass. to manufacture the Vocalion. This venture soon ran into financial difficulties and the operation was eventually taken over by Mason & Risch who continued to manufacture the Vocalion in Worcester under the new company name of the 'Vocalion Organ Co.' The manufacture of Vocalions continued until about 1903 when the company was absorbed into the Aeolion empire. Aeolion continued to make what was basically a Vocalion in its 'Orchestrelle', a costly player - organ.

The design of the Vocalion is characterised by a casework that is considerably wider than the keyboard, necessary to accomodate the wider reed design and the two large wind conductors located on each side of the organ casing. The wide spacing of the reeds also necessitates use of an indirect mechanical linkage between keyboard and pallet valves i.e. a tracker system.
Vocalions were expensive to manufacture and were well made, top of the line, instruments. In the 1890's, a small Vocalion cost about $275 and a large version for church use in excess of $2000 - a considerable sum of money in those days.
The American made Vocalions are not particularly rare today. The position regarding the Canadian made Vocalions, however, is not at present clear.We do know , nevertheless, that the first Vocalions to be sold in North America were of Canadian manufacture, a product of 'S.R. Warren & Son'.

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FoMRHI Comm. 1264 b

John Downing

The Canadian Vocalion - Part 2

In the Zion United church, Apple Hill, Ontario, Canada, there is an old reed organ that has been in regular use for church services since 1925. According to church records, this instrument was originally built by the Warren Company (one of the most prominent pipe organ builders in Canada) for St Mungo's church in Québec and is dated 17th July 1884 (Note 1).

The organ was inspected by the author on 23 July 1993. The extent of the inspection was primarily external but with front and rear panelling removed to allow the organ works to be viewed in greater detail. This Comm. summarises the results of this inspection.

Inspection Report

The organ is a large two manual instrument with pedal keyboard standing 127 inches high, 81 inches wide and 54 inches overall depth including the pedal keyboard. The casework is of oak with an array of gold painted metal show pipes above the console (see Fig 1).
The organ has been built into an alcove at the South end of the church with matching oak panelling.

Nameplate: Traces of gold lettering above the manual keyboards were examined under strong oblique lighting to reveal the following legend:
'VOCALION, WARREN PATENT', 'MANUFACTURED FOR MASON & RISCH BY S.R.WARREN & SON'

Pitch: Measured as 440Hz plus 48 Cents or nominal A452.5 Old Philharmonic pitch (Note 2).

The Console

The upper (Swell) and lower (Great) manual keyboards each cover a range of over 4 octaves, C - A.
The pedal keyboard covers a range of over 2 octaves, C - F and is of the old style configuration i.e. with the keys arranged parallel to each other in a flat horizontal plane (Note 3).
Pull stops grouped to the left side of the manual keyboards are named as follows:

Diapason
8ft Oboe Swell
4ft Flute Swell
Vox Humana
16ft Bourdon
Pedal Forte

Pull stops grouped to the left of of the manual keyboards are named as follows

Swell to Great (coupler)
Great to Pedal (coupler)
Swell to Great (coupler)
Principal
8ft Clarionet Great
8ft Clarabella Great
16ft Tuba Great

An additional pedal, located just above the pedal keyboard, controls a swell shutter on the reed banks comprising the Swell organ giving a forte feature to this group of stops.

Diapason, 8ft Oboe Swell, 4ft Flute Swell: The reed banks associated with these stops are located within a windbox situated directly above the console at organist head height. The pallet valves are operated by the upper keyboard directly through pitman rods. The windbox is provided with a front facing shutter operated by the forte pedal above the pedal keyboard.
The sound from this group of reeds is further modified by the fallboard which effectively covers the front sound grills above the console when raised to the normal playing position.

16ft Bourdon: The reed bank for this stop is located within a windchest at the back of the organ and is operated by the pedal keyboard through a mechanical tracker system.
The reeds are accessible through spring loaded, air tight doors and are mounted horizontally in individual cells in an inverted position. The cell walls are grooved to receive the reeds which are slid into position.
A swell shutter located above the reed bank is operated by the Pedal Forte draw stop.
The lowest C reed was withdrawn for examination. This reed is exceptionally large and broad, the reed tongue itself measuring 4.5inches long by 1.875 inches wide, the tongue being voiced with the usual curve and twist to the free end. Reed material is brass.

8ft Principal, 8ft Clarionet Great, 16ft Tuba Great: The reed banks associated with these stops are located at the top of the organ accessible by removal of the show pipes, the pallet valves being operated by the lower manual keyboard through a tracker system.
The reed banks are provided with a system of 30 conical metal resonators and an open wooden soundbox containing 16 windway outlets.
The reeds are accessible through spring loaded doors but were not examined.
The 16ft Tuba Great stop covers a range of 46 notes the lowest octave on the keyboard being mute.

8ft Clarabella Great: Due to problems with reed breakage, the reeds associated with this stop were removed during the 1960's and replaced with a rank of 58 open metal organ pipes of 4ft pitch. The smallest pipes have been mounted directly into the reed bank windways and the largest pipes have been mounted as a group on a solid pine windchest fed by plastic tube wind conductors.
The pipes are fitted with tuning collars and have been voiced by nicking the upper lips.

Wind Supply: The large bellows are located in the bottom of the organ casing and were originally operated by hand by means of a metal lever located on the right hand side of the casing at the rear.
The organ has now been converted to electric blower operation feeding the right side of the bellows which remain intact. The metal arm has been removed and kept in store.
Wind supply to the reed banks is by means of two wooden conductors located on the left and right side of the organ casing.

The organ operates on a pressure system,like a harmonium,the wind exhausting to the exterior to provide a louder sound volume.

Performance Characteristics

The sound of the organ is smooth and powerful, easily filling the church auditorium. Its tone is similar to that of a pipe organ but a little 'reedy' in character - not an unattractive sound, however.
The contrast between the stops is less pronounced than would normally be found on a pipe organ.
The current hybrid arrangement of pipes and reeds presents a physical problem of relative tuning - small variations in ambient temperature causing the pipes to be out of tune with the reeds. Attempting to play the organ after the church heating system had been shut down for maintenance produced some painful dischord when the pipes were employed.
Careful temperature control of the building is, therefore, essential and the pipes sound well in combination with the reeds when this is achieved. Never--theless under normal circumstances when conditions are not ideal employment of the pipes introduces a slight fairground organ character to the sound - not unpleasant but definitely an acquired taste!
According to the organists who have played the instrument, the mechanical tracker and coupler systems combined with the flat pedal keyboard make the organ somewhat heavy and awkward to play compared to a modern pipe organ resulting in a somewhat slower response.

Conclusion

The reed organ at Apple Hill although not in original condition, has been well maintained over the years and is in good playing condition. The church council have now established a fund to ensure that the organ is conserved in its current state as part of the history of the church. Some consideration is also being given to restoring the 8ft Clarabella stop to its original state,the bank of reeds having been kept in store.

Although more research needs to be undertaken concerning this organ, the nameplate and date suggest that this may have been one of the first reed organs of the Vocalion type to be built in North America. The fact that it was also made by a Canadian organ builder make it historically significant as most Vocalions produced in later years were manufactured in America. The uniqueness or otherwise of the organ may be established later as more infor--mation is brought to light concerning the manufacture of Vocalions by the company of S.R. Warren and Son.

Notes

1. Information about the date was provided by John Munro, an organ builder based in North Bay, Ontario. The date is apparently hand written on the front of the upper wind chest only visible on removal of the show pipes. While he is convinced that the date reads 1884 Munro says that it is possible to interpret the date as 1889. With the current state of know--ledge concerning the Warren Vocalion, the earlier date would seem to be the most likely date of manufacture.

2. This may be the Warren standard pitch as an earlier melodeon by S.R.Warren inspected by the writer recently, had the same pitch.

(continued on p. 70)

FIG. 1