

FOMRHI Quarterly

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FELLOWSHIP OF MAKERS AND RESEARCHERS OF HISTORICAL INSTRUMENTS

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FELLOWSHIP of MAKERS and RESEARCHERS of HISTORICAL INSTRUMENTS

Bulletin 45

October, 1986

It's again time to renew your subscription and, as I warned you in the last Bull, I'm afraid that it is going to cost you more than last year. We have held the rate for quite a while, in fact we have been running at a loss for a year or more, because we had built up a surplus that we did not need. Printing costs have been going up, year by year, and postal costs have escalated (every year the Post Office tells us with pride what a massive profit it has made in giving us a lousy service, and then says that it's going to put the postage rates up even higher; they've just done it again).

It would be nice if you would NOW take the renewal form out, fill it in, write a cheque or whatever and post it tomorrow morning to FoMRHI, c/o Maggie Lyndon-Jones, 20 Queen Street, St.Albans, Herts AL3 4PJ, England (it would make her life much easier if you did it now instead of waiting till after Christmas or even till this time next year), but in case you don't, and have lost the form by the time you get round to it, the new rates are:

UK & everywhere by snail-mail:	£6.50
Airmail to Europe supplement:	£1.50, total £8.00
Airmail everywhere else supplement:	£3.00, total £9.50

If you are not paying in sterling, or by sterling draft on a British bank, or by Eurocheque, or into our GIRO account (no.27 316 4406, and if you don't write your name and address on the counterfoil, we won't know that you've renewed, will we?), please add £1.00 for bank conversion charges. If your country allows you to send your own personal cheques abroad, that, with the £1 added for conversion, is probably the cheapest and simplest way to do it.

Maggie has two particular requests:

- a) Please make your cheques etc payable to FoMRHI and not to her;
- b) Please don't register your letters, nor send them by recorded delivery, unless you really have to do so. The Post Office in St.Albans doesn't deliver registered or recorded-delivery letters; she has to trek down town and collect them! And she really doesn't have time to keep on doing that.

If you can afford to add something to help pay for members who are not allowed to export currency, they and we will be very grateful. I'm always interested to hear of more such potential members. The more we can spread information, the better we fulfil our raison d'être.

I gather from Tjeerd Bosklopper that this rise in rates may be a problem for Dutch, and perhaps other, members, in that above a certain figure the banks and post offices increase their charges considerably. He suggested paying twice a year, to keep below the limit, but Maggie feels that it would be too

complicated for her to send bills twice a year. Eurocheques, or if necessary two Eurocheques in the same envelope, are probably the answer. The bank used to charge for clearing Eurocheques, but they don't charge us at all now.

BACK ISSUES: The rise in postage rates has forced the cost of these up, too. They now cost £1.25 each (surface) and £2 (air). Year sets from Q 26 (1982 onwards) are still available, and there are a few odd copies left of Qs 18, 20, 21 and 25. The Index of the first 500 Comms is still £1.00.

Uta Henning (in the List of Members) is photo-copying out-of-print Qs at a cost of DM -.20 (ie 20 Pfennig) per sheet which contains two pages. She can do them single or double sided, the size they are or enlarged or reduced (you could get 4 pages on a sheet that way, but I doubt whether you could read it). Tell her what you want. She doesn't mention postage, and you'll probably have to add for that.

OBITUARY: You will be sorry to hear that Herbert Werner, one of our German members, died recently.

LOST MEMBER: Gerardo Parrinello's July Q came back from Milan marked *Trasferito*, which I take to mean that he's moved; if any one can tell me where to, I'll send it to him again.

LIST OF MEMBERS: I've given a copy of the List to a firm called IBIS who say that they operate a *FREE information service about new specialist books and journals...and would like to include the members of your organisation.* It might be useful, and if it's not you can always file it in the obvious place. I seem to remember sending them a copy last year, and I don't think I got any more book lists than I normally do.

FURTHER TO: Comm. 699: Bob Barclay writes:

Cary Karp's Comm 699 says it all, although I agree with Maggie Lyndon-Jones that perhaps some of us are "not ready for him yet". That computer technology will expedite production of such materials as the CIMCIM Newsletter and the FOMRHIQ is beyond question, but obviously it will take time for the more conservative and less well-heeled to catch on and take advantage.

Most of the conservatives (sic) with whom I am in daily contact won't use a word processor because they don't want to be bothered learning how. I cannot understand this attitude from people who have taught themselves to type - a hundred times more difficult! Once you can type, the rest is easy and, of course, the yield is a hundredfold. And these word processors and memory typewriters are awfully addictive - having used one once, I never touched an ordinary typewriter again. Similarly, using word processing and formatting software literally cuts production time of newsletters and other similar material by a factor of ten while producing a very fine quality document. I firmly believe that the Q could and should be cleaned up using electronic data processing methods. Compare pages 52 and 131 of Q43 to get but a small idea of the difference in quality. Which do you prefer to

cast your eyes over? Frankly, I agree with Marc Champollion in finding much of the typed material in the Q, especially dot matrix printed, of intolerable quality (although his own typographical errors and corrections leave a lot to be desired). I know and respect the FOMRHI policy and I can understand the reasons for the "quick and dirty" approach, but I can see a time when the majority of subscribers will agree with me.

Bulletin Supplement in the last Q (p.7): JK writes: I would not say that any overlap with GSJ is *unfortunate*; undesirable, maybe. I think that the two journals have different functions, as well as different styles. GSJ is a 'journal of record', that is to say that it gets into a lot more libraries than we do (good; FOMRHIQ doesn't belong in libraries to my mind; the point of being a Fellowship is that our readers should all be members, swapping information), and it gets bound up in volumes and that it's likely still to be there in 50 years time, whereas I'd be very surprised if this Q will still be around then. I'd agree that we often cover the same ground (we're both mainly concerned with musical instruments, so how not?), but we do it differently. I still reckon that we could include preliminary versions of articles that would, and should, appear in GSJ in their finished form. That, incidentally, is one reason why I think that all our members should read GSJ as well as FOMRHIQ (and, for that matter, Early Music and AMISJ, both of which share some of the functions of GSJ).

Comm. 706: Luis Pereira says:

On Comm. 706 - I would like to point out that the system of an auxiliary rule to divide by 10 the divisions of the caliper is called nonio from the latin version of the name of its inventor, Pedro Nunes (Nunius, in latin), mathematician born 1500 in Alcaacer do Sal and dead in Coimbra 11/8/1578. Teacher of the princes Luis and Henrique of Portugal, was appointed "Magister Cosmographus" to the king. In his book "De Crepusculis", published 1542, described his invention of the NONIO. His written work is more devoted to mathematics than to medicin, science where he got, also, a doctorate degree by the Salamanca University.

Comm. 728: Margaret Neuhaus (who has just joined us) asks me to say that Tony Bingham is handling her excellent *Baroque Flute Fingering Book* in the UK and has "an ample stock". Tony's address is in the List of Members.

QUERIES: Geoffrey King (new address in Supplement herewith) asks about the development of the layout of the standard keyboard. "I have heard verbally, but never seen printed, that the earliest hurdy-gurdies were diatonic but that when the need for a chromatic scale arose there was no room for additional tangents between those for the diatonic scale. The solution was to have another level of tangents above but the keys had to be set back somewhat to prevent accidentally pressing them when a note of the diatonic scale was intended. The legend(?) concludes that this arrangement was adopted in subsequent keyboard design and explains why the accidental keys are

set up and set back from those of the scale of C. Does this hypothesis have a reasonable basis?"

Richard Collier has a couple of questions: Can anybody produce any information about the life of George Hurworth, serpent player to George III? He has read the usual entries in musical dictionaries, etc.

And has anyone produced working drawings of any of the bagpipes and symphonies, etc, in the carvings of Beverley Minster?

Geoffrey Burgess (new member, in the Supplement herewith) is researching into early oboe reeds. He knows Bruce Haynes's list, but if anyone knows of any early reeds that are not listed there, would they please let him know.

A FREEBY: A firm called Toolmail (GMC) Ltd, 170 High Street, Lewes, East Sussex BN7 1YE, says they "are now part of the Guild of Master Craftsmen...and are in the position to offer a limited quantity of copies of our fifth (mail-order tool) catalogue to your members COMPLETELY FREE OF CHARGE. All a member need do is send his name and address to Toolmail, state his or her membership of your organisation, and we will send the member our brand new 128 page full colour catalogue, together with a free coffee table plan and a £5 voucher redeemable against their first order". It looks quite a good catalogue of general tools, but there aren't any specialised instrument-making tools in it.

MUSIC, ETC, AVAILABLE: Clifford Bartlett asks me to say that King's Music has moved to: "Redcroft", Banks End, Wyton, Huntingdon, Cambs PE17 2AA, tel: 0480-52076. They've just issued a new catalogue of facsimiles and editions of baroque music at reasonable prices. He would be interested to hear "from owners of 18th century prints who would be prepared to make them available for reproduction" and thus expand their catalogue of contemporary editions.

The new Oxford Music Processor is a computer program for printing music to a very high standard (the sample looks like top-quality engraving). You would need an IBM compatible machine with 256K memory (and a fairly expensive printer, though you could contract that out), and it would then take you "under five minutes (!) to enter a full page of keyboard music". It really is quite something, and it should be ideal for anyone wanting to produce their own editions of music, and therefore especially for early music people. The program will cost £400 + £60 VAT. Orders to: Anne Yates, Oxford Electronic Music Publishing, FREEPOST, Oxford OX2 6BR. The inventor, Richard Vendome, who is a member of our Faculty, will be talking about it and showing what it can do at the forthcoming Music Calligraphy Conference (see under **MEMA** below).

PLANS: There's a new Bate List of Plans elsewhere here, partly because we have one new plan, a Miller C Clarinet drawn by Charlie Wells as a by-product of the excellent restoration job he did on it, but chiefly because we have had to revise the prices. For one thing, they have stayed the same, like the

FoMRHI sub. for some years, and our costs, like everyone else's go up all the time. For another, I think now that Ken was right when we first discussed the matter, and that I was underpricing them. They have been cheaper than anyone else's and since anyone that was making an instrument for sale is going to charge in three figures, they can afford to help the Bate buy some more instruments (this is where the money goes), and anyone who is making for themselves is saving most of those three figures, and could afford to help us, too. One remains the same, because when I asked Fred Morgan if we could sell his drawing of the Bressan treble, he specifically asked me to keep the price as low as possible.

There's also a new list of the Royal College of Music plans.

COURSES: You know about the Bate Collection Capped Reed Weekend already. To remind you, it's November 8th & 9th, with Bernard Thomas and Eric Moulder. Next term, it'll be an Early Bassoon Weekend on February 21st and 22nd, with Andrew Watts, one of the best of the young up-and-coming early bassoon players, and Paul White, who is now one of our graduate students and whose article on early bassoon reeds in AMISJ you may know (you should if you're a bassoonist); he makes bassoons and he has recently finished a copy of our Tauber contra for David Chatterton. By the way, these are *Bate Collection Weekends*, not FoMRHI weekends (though most of the participants, I'm glad to say, are FoMRHI members, by the end if not before), so that means that cheques (£15 for the weekend, £10 for either day and £10 for full-time students for the weekend) must be made out to the Bate Collection, *not to FoMRHI*; I had to send two back the other day for amendment.

Douglas Cook has sent me a notice of the recorder and Renaissance wind instrument course at Richmond House, 37/39 Eskin Street, Keswick-on-Derwentwater, Cumbria CA12 4DG from March 28th to April 4th. Carl Willetts will be running it. The course costs £135 full board (+ £5 if you want a private shower and WC), and they ask for bookings as soon as possible, so as to make sure that the course is viable (with a £40 non-returnable deposit, which will be refunded if they have to cancel it) to Mr. Cook at that address.

EXHIBITIONS: The Paris Musicora will be from 4th to 9th March next year. Last year they had 200 stands, 303 exhibitors, and 18,000 visitors. It's not cheap; a bare space costs 550 F per m², and an equipped space (they don't say what with) costs 950 F per m². They don't give a deadline date for bookings, but it's probably fairly soon. If you're interested the address is SODITEC, 62, rue de Miromesnil, 75008 Paris.

Rumour has it that there will be a Horticultural Hall Early Music Exhibition next year, but nothing has come round yet.

MUSEUMS: Elizabeth Wells has asked me to remind you of the new opening times at The Royal College of Music Museum, now Mondays as well as Wednesdays (in their termtime only), 11.00-4.30. Admission costs 60p (students and OAPs 40p), and if you want

any specialist attention you should make an appointment, as at any museum. Address and phone is under her name in the List of Members.

Our phone number at the Bate Collection should be changing on January 12th (if they're finished the rewiring in time). Unless they change the number (you can tell I don't trust this sort of thing!), it will be 0865-276139. If it all works, it should be quite a system; if I go off somewhere else within the University I should be able just to plug in my number, and calls will follow me around. Not to home, though, thank God.

NEMA: The National Early Music Association is arranging Calligraphy Conference next January. Madeau Stewart will be talking about medieval manuscripts, with examples of all the materials used; somebody, they hope, will be discussing classical manuscripts, and Richard Vendome will be showing off the Oxford Music Processor (for more on which see above). Venue has not yet been fixed, though it may be the Royal Academy of Music in Marylebone Road, nor the date confirmed, but it's likely either to be January 17th or 31st, probably the latter. It will be a morning and an afternoon and combined with their AGM. There will be a small charge, probably two or three pounds. More definite information from them (in the List of Members) nearer the time.

You may remember from the last Bull that they had a very successful Education Conference recently. One of the things that has come out of that is evidence of the need for inexpensive early instruments for schools, and for children to have as their own. NEMA would like to work with us and with the London College of Furniture (and anyone else interested) on this. If you might be willing to make a cheap line of instruments and would be interested in discussing this further, would you please either let me know or get in touch with them direct. This is important for us all. If we can catch them young and get them started on instruments that they can afford, we have the next generation built in. I did stress at the Council meeting that there wasn't a lot of point of doing it if the result is going to be instruments that neither feel nor sound like proper ones, and that we are committed to a reasonably authentic standard (shades of Comm.100!).

ICONOGRAPHY: I had a card the other day from Frederick Crane (re my review in Comm.691 of his jews harp journal) and the picture on the card was really rather fun. It is a painting in the National Gallery of Art, Washington, called *My Gems* by William Harnett (1848-1892). It includes one of those German 8-key flutes with which many of us are familiar, with an ivory head joint, cracked all the way along, with the crack running right through the embouchure. There is also what appears to be an Eulenburg miniature score (presumably one of the earlier yellow paper covered editions) and a sheet of music entitled *Hélas Quelle Douleur* and various other objects. Presumably a 19th century version of a Vanitas painting.

TRUMPET EMBOUCHURE: Kevin Mercer sent me a xerox of an article 'Science proves musical myths wrong' from *New Scientist*, 3rd April 1986, which he said that he had found helpful though there is nothing specific about early trumpets. It's interesting.

DEADLINE FOR NEXT Q: I think we'd better say 31st December (there are no posts on Jan.1st) even if it is likely to get caught up in the tag end of the Christmas postal crush. I've got this out pretty smartly and I'll try to do the same again.

DO PLEASE REMEMBER TO RENEW YOUR SUBSCRIPTION, if possible before then as it makes it so much easier for Maggie, Djilda and me if renewals are spread out (Maggie has to process you all, and Djilda and I have to sort out who is entitled to receive the January Q, and it gets very hard work when it's all left to the last minute). We all three have other work that we are paid to do, so please help us if you can.

Have a nice winter.

Jeremy Montagu
Hon. Sec. FoMRHI

Bulletin Supplement 45

E. Segerman

This has turned out to be a thicker Q than we can normally afford to produce, so I've held back 4 Comms for next time. All are mine. The Comm I did include (besides the obligato DOMI) just happened to fit the space best. It's on speed of playing and some would say it doesn't belong here. I believe it does because the players keep pestering us about quicker response on our strings and instruments. Historical information on this subject won't stop this pestering, but it could encourage those who can be musical at a slower tempo, and we might be able to offer them slightly more authentic equipment.

I have had no response to the proposed FoMRHI Conference on Medieval and Renaissance Instruments and how they were used. If there really is so little interest we won't have to hire a big room and we'll have it in someone's home. Perhaps, to make sure attendance stays small, we should restrict the conference to medieval instruments. Let's make it late February or early March to give the announcement in the next Q time to be acted on. Chris Page suggested Oxford as the place. Are there any invitations for a venue from there or elsewhere? Manchester at NRI is always possible but perhaps not central enough.

In Comm 727 under Flute, J.M. expressed revulsion for the term 'air reed', and suggested that 'serious organologists' avoided it. Physicists have defined a reed in a musical instrument as a valve which allows puffs of air into an air column. It cooperates with (and thus maintains) the oscillation of that column. The material of that valve could be the lips, a reed or air. The physicist has simply used the name of an example to name a whole class. This revolting practice is also indulged in by organologists who have done this with 'lute'. An air type of reed is no more disgusting than a violin type of lute. A reed type of reed is no more awkward than a lute type of lute. In modern terminology, the terms 'lip valve', 'reed valve' and 'air valve' are often used, so it is often possible to avoid the generic term 'reed'.

Continued on p. 22

BATE COLLECTION OF HISTORICAL INSTRUMENTS

St. Aldate's

Oxford, OX1 1DB

PLANS AVAILABLE

Telephone: Oxford 247069

RECORDERS:

	cat. no.	price
Peter Bressan, FOURTH FLUTE , boxwood, early 18th c. ex Edgar Hunt Coll. A now = c.424 Hz. Measured & drawn Heinz Amman, 2 sheets.	0109	£ 5.00
Peter Bressan, TREBLE , boxwood & ivory ex Edgar Hunt Coll. A=c.404 Hz. Measured & drawn Frederick Morgan, 1 sheet Measured & drawn Friedrich von Huene, 5 sheets	0112	£ 1.00 £ 10.00
Anonymous (Bressan style) BASS , maple & ivory ex Edgar Hunt Coll. A=c.404 Hz. Measured & drawn Ken Williams, 4 sheets	0114	£ 10.00
Renaissance BASSET marked !! !!, maple, 16th c. ex Michael Morrow Coll. A=c.462 Hz. Measured & drawn Tim Cranmore, 1 large sheet	0117	£ 5.00

TABOR PIPES:

Henry Potter, boxwood & ivory, c.1850 ex Galpin Coll. Lent A.C.Baines. in D at A=432 Hz	x 01	
Rudall, Carte & Co, boxwood, mid-19th c. ex Overy Coll. Lent A.C.Baines. in D at A=435 Hz Measured & drawn Ken Williams, together on 2 sheets	x 02	£ 10.00

TRAVERSI:

Charles Bizet, Paris, boxwood & ivory, early 18th c. 1 silver key. Morley-Pegge Memorial Gift. A=c.397 Hz. Measured & drawn Ken Williams, 2 sheets	106	£ 10.00
Thomas Cahusac, boxwood & ivory, 2nd half 18th c. 1 silver key. A=c.427 Hz. Measured & drawn Ken Williams, 2 sheets	11	£ 10.00
William Milhouse, boxwood & ivory, c.1800 5 silver keys (D foot). Lent Jeremy Montagu Measured & drawn Noel Sheehan, 1 sheet	x 1081	£ 5.00
Richard Potter, boxwood & ivory, dated 1782 6 silver keys (C foot), 3 upper-body joints, 4,5,6. A=c.418, 427 & 436 Hz. Measured & drawn Ken Williams, 2 sheets	1028	£ 15.00
Proser, boxwood & ivory, last quarter 18th c. 1 silver key. ex Edgar Hunt Coll. A=c.427 Hz. Measured & drawn Ken Williams, 2 sheets	1066	£ 10.00
Schuchart, boxwood & ivory, mid-18th c. 1 silver key. Lent A.C.Baines. A=c.420 Hz. Measured & drawn Ken Williams, 2 sheets	x 11	£ 10.00
Thomas Stanesby jr, ivory & silver, c.1735 1 silver key. Lent Jeremy Montagu. A now = c.437 Hz. Measured Andreas Glatt, drawn David Cox, with a trace by Rod Cameron, 2 sheets	x 1050	£ 5.00
Stanesby jr FLUTE D'ANDUR , boxwood & ivory, c.1720 1 silver key. In B flat at A=415 Hz. Measured & drawn Ken Williams, 2 sheets	1015	£ 10.00

OBOES:		cat. no.	price
Anonymous, 'THE GALPIN' , boxwood & ivory, c.1680-90	200		
3 silver keys. ex Galpin & Halfpenny Colls.			
A=c.392 or 403 Hz. Measured Mary Kirkpatrick, drawn Ken Williams, 2 sheets			
			£ 10.00
Anonymous German transitional , boxwood, c.1760	292		
3 brass keys. ex Edgar Hunt Coll.			
Measured Mary Kirkpatrick & Gail Hennessy, drawn Ken Williams, 2 sheets			
			£ 10.00
Charles Bizey , maple, 1st half 18th c.	201		
2 silver keys. Morley-Pegge Memorial Gift. A=c.407 Hz.			
Measured & drawn Ken Williams, 2 sheets			
			£ 10.00
Thomas Cahusac sr , boxwood & ivory, 2nd half 18th c.	2013		
2 silver keys. ex MacGillivray Coll.			
Measured & drawn Ken Williams, 2 sheets			
			£ 10.00
Christophe Delusse , Paris, cedar & silver, c.1785	20		
3 brass keys (3rd key F#).			
Measured & drawn Ken Williams, 2 sheets			
			£ 10.00
Richard Milhouse , Newark, boxwood, straight-top	293		
2 brass keys. ex Edgar Hunt Coll.			
Measured & drawn Ken Williams, 2 sheets			
			£ 10.00
Jean-Hyacinth Rottenburgh , Brussels, TENOR OBOE	248		
boxwood & brass, bulb bell, 1st half 18th c.			
3 brass keys. ex Morley-Pegge Coll.			
Measured & drawn Ken Williams, 2 sheets			
			£ 10.00
Thomas Stanesby jr , maple & silver, c.1735	29		
2 silver keys, plain model. A=c.421 Hz.			
Measured Mary Kirkpatrick, drawn Ken Williams, 2 sheets			
			£ 10.00
Anonymous, OBOE MUTE , wood, c.1800	x 2012		
Lent A.C.Baines			
Measured & drawn Ken Williams, 1 sheet			
			£ 5.00
CLARINETS:			
Baumann , Paris, boxwood & horn, 1st third 19th c.	40		
6 brass keys (6th cross C#), in C.			
Dossier of measurements & drawings, Alan Mills			
			£ 5.00
George Miller , boxwood & ivory pair, c.1760	4008/9		
5 brass keys & added shake, in B flat.			
Portrayed by Zoffany in 'The Sharp Family'.			
Lent The Executors of Miss O.K.L.Lloyd-Baker.			
Dossier of measurements & drawings, Alan Mills			
			£ 5.00
George Miller , boxwood & ivory, c.1770	422		
5 brass keys, in C.			
Restored, measured & drawn Charles Wells, 3 sheets			
			£ 10.00
William Milhouse , boxwood & ivory, c.1800	111 170		
5 brass keys, in B flat. Jeremy Montagu Coll.			
Dossier of measurements & drawings, Alan Mills			
			£ 5.00
Moussetter , Paris, boxwood, c.1780	406		
5 brass keys, in B flat.			
Measured & drawn Ken Williams, 2 sheets			
			£ 10.00

BASSOONS:	cat.no.	price
Thomas Cahusac sr, maple (wing boxwood), dated 1769	x 35	
4 brass keys. ex Brailles Church, ex Langwill Coll, Lent Philip Bate. A=c.407 Hz.		
Measured & drawn Ken Williams, 2 sheets	fullsize	£ 15.00
	the drawing	halfsize £ 10.00
Dominique Porthaux, Paris, maple, c.1800	x 30	
5 brass keys. Lent A.C.Baines. A=c.415 Hz.		
Measured & drawn Ken Williams, 2 sheets	fullsize	£ 15.00
	the drawing	halfsize £ 10.00
CATALOGUE OF THE BATE COLLECTION, Anthony Baines, 1976		£ 2.50
Supplement: The Edgar Hunt Accession		£ 0.20
Supplement: The Retford Gift		£ 0.20
BASSOON REED-MAKING (Special Exhibition Catalogue)		£ 0.20
INSTRUMENTS OF THE BIBLE (Special Exhib.Catalogue)		£ 0.20
BATE GUIDES, Jeremy Montagu: Flutes		£ 1.00
Reed Instruments		£ 1.00
Brass Instruments		£ 1.00
Percussion		£ 1.00
String Instruments & Keyboards		£ 1.00
Catalogue, The Javanese Gamelan <i>Kyai Madu Laras</i>		£ 0.50
POSTCARDS, including MINIPLANS (postcard size miniatures of the drawings of the plans)		£ 0.20

All plans are on paper, most of them photocopies on A3 sheets. The three exceptions (the full-size bassoons and the renaissance recorder) are dye-line copies on A1 sheets. All are full size, with the two exceptions listed above.

The plans by Ken Williams were made with the aid of a grant from the Music Board of the Australia Council. Copies are available in Australia from the Music Librarian, State Library of Victoria.

Orders from all other parts of the world should be addressed to: The Curator, Bate Collection of Historical Instruments, Faculty of Music, St.Aldate's, Oxford OX1 1DB, UK. Cheques should be made payable to The Bate Collection, Oxford, and **MUST** be in pounds sterling. The University has no GIRO account.

Prices include postage (by surface abroad), folded flat to A4 size; if rolled copies are required, please send a tube or other container, and add enough postage to cover its weight.

Jeremy Montagu
Curator, Bate Collection
of Historical Instruments

MUSEUM OF INSTRUMENTS
 THE ROYAL COLLEGE OF MUSIC
 PRINCE CONSORT ROAD
 SOUTH KENSINGTON
 LONDON SW7 2BS

PLANS OF INSTRUMENTS

Technical drawings of the following instruments are now available. These dyeline prints are detailed full-scale plans on stout paper for the benefit of those wishing to carry out organological research or build copies.

The prices shown below do not include packing (in cardboard mailing tubes) and postage. VAT at 15% has to be added for UK orders. Please do not send money with your order, but wait until you receive our notification. On receipt of your remittance, we will send you the drawings.

For orders from abroad, please send a cheque or bank draft in sterling, payable by a bank in London. If, however, you wish to pay in your own currency, please add the equivalent of £3.00p. to your remittance to cover the bank costs which will be payable by us. Please do not send a Post Office money order.

RCM No.

- | | | |
|-----|---|----------|
| 48 | Cittern by Gieronimo Campi, Italian, late 16th century. Lacks rose and bridge. Overall length 728 mm. Original string length 433 mm. approx. (1 sheet, 850 mm. x 600 mm.) Drawn by Ian Harwood, 1974. | £6.00p. |
| 26 | Chitarrone by Magnus Tieffenbrucker, Venice, 1608. Stringing 6 x 2, 8 x 1. Body length 679.5 mm. String lengths 933 mm. approx. and 1700 mm. approx. (3 sheets, 850 mm. x 600 mm.) Drawn by Ian Harwood, 1974; revised, 1977. | £9.00p. |
| 171 | Guitar by Belchior Dias, Lisbon, 1581. Vaulted back, body length 365 mm., belly not original. (2 sheets, 1120 mm. x 770 mm., with additional notes.) Drawn by Stephen Barber, 1976. | £13.00p. |
| 32 | Guitar, attributed to Jean Voboam, Paris, c. 1680. Length of back 456 mm. Bridge not original. (2 sheets, 1280 mm. x 950 mm. and 950 mm. x 810 mm., with additional notes.) Drawn by Stephen Barber, 1979. | £13.00p. |
| 46 | Division viol by Barak Norman, London, 1692. Length of belly 634 mm. Present string length 658 mm. (2 sheets, 1370 mm. x 1040 mm.) Drawn by Stephen Barber, 1976. | £14.00p. |
| 63 | Recorder (treble), I. Denner, Nuremberg, early 18th century. Carved ivory. Pitch: A = 415 approx. (1 sheet, 585 mm. x 470 mm., with additional notes.) Drawn by Friedrich von Huene, 1968; revised, 1978. | £4.00p. |

- 1 Clavicytherium, ? German, c. 1480. £22.00p.
 1 x 8. Present compass E-g²; original compass thought to
 have been E 'E#' P G-g². Overall height 1415 mm.
 (1 sheet, 2360 mm. x 1030 mm., with additional notes.)
 This new drawing replaces the less detailed one made by
 Derek Adlam and William Debenham in 1976.
 Measured and drawn by William Debenham, 1983.
- 2 Harpsichord by Alessandro Trasuntino, Venice, 1531. £22.00p.
 Formerly 1 x 8, 1 x 4, now 2 x 8. Present compass
 BB/GG-c³; original compass thought to have been C/E-f³.
 Overall length 2250 mm. Outer case not drawn.
 (1 sheet, 3480 mm. x 1030 mm., with additional notes.)
 Drawn by William Debenham, 1977.
- 175 Harpsichord, ? Italian, c. 1575. £18.00p.
 Originally 1 x 8, now 2 x 8. Original compass C/E-c³;
 present compass C-d³ without C#. Overall length 1860 mm.
 Lacks original outer case.
 (1 sheet, 2130 mm. x 1030 mm., with additional notes.)
 Drawn by Grant O'Brien, 1974.
- 3 Bentside spinet, English, 1708. £15.00p.
 Compass BB/GG-d³, the lowest two sharps being divided to
 give both the short octave and the sharps. Overall
 length 1680 mm.
 (1 sheet, 1930 mm. x 1030 mm., with additional notes.)
 Drawn by William Bright, 1975.
- 209 Regal, German, 1629. £15.00p.
 Compass C/E-c³. Metal resonators. Overall length 1165 mm.
 (1 sheet, 1875 mm. x 1025 mm.) Drawn by Christopher Clarke,
 1979.

A series of photographs of each of the above instruments is also obtainable. Details will be sent on request. (There is a large number for some of the keyboard instruments, so it is unlikely that a complete series would be desired.) Prices: 4" x 6" prints £2.20p. each, 6" x 8" prints £3.40p. 8" x 10" prints £4.00p. plus postage, and VAT for UK orders.

Review of: Malou Haine & Nicolas Meeùs, *Dictionnaire des facteurs d'instruments de musique en Vallonie et à Bruxelles du 9^e siècle à nos jours*, S.A. Cogédi, Pierre Mardaga, 2/4 Galerie des Princes, 1000 Bruxelles, 1986. 768 pp, 267 illus. 3,250 Fr. Belg.; 515 Fr. French.

This massive tome, more than twice the size of Langwill's *Index* which covers the wind instrument makers of all countries, is an inventory of instrument makers (admittedly of all instruments) of less than half of one country, only of the Francophone part of Belgium and of Brussels which, while traditionally francophone is not part of the province of Wallonia. It is quite a tour de force. The general text arrangement is much more like the New Grove DOMI (or Boalch, the string-keyboard makers' index) than like either Langwill or Vannes (the string instrument dictionary). Each maker, and I must confess that I haven't found the 9th century one, has a brief but well-written account of his life. His surviving instruments are, with rare exceptions save for organ builders and bell-founders, omitted in the main text, but are listed in an index at the back.

Other indexes (a plural which is apparently preferred by indexers) contain:

- a list of makers arranged by their town, including expatriate Walloons, so that this list is not confined to Belgium, and arranged within each town by their speciality among instruments and by their century;

- a list of the work of Walloon organ-builders at home and abroad;

- a similar list for bell-founders,
- and a very detailed bibliography.

The list of instruments is arranged by museums and collections; which means that if you are chasing the work of any one maker, you have to go right through the whole list. I have not checked this list for accuracy, but I warn you that the Oxford collections are confused, and we have to hope that this is not typical. There is one entry for *Oxford, University of Oxford*, which lists indiscriminately my instruments (by no means completely) and those in the Bate Collection and has no entries for either the Pitt Rivers or the Ashmolean museums, nor any other private collections in this city (maybe there are no other instruments from Walloon sources in Oxford, but since I have several others, it leaves me wondering).

Thus I have some reservations about this Dictionary, but they are confined to the less important sections of the book. For its main purpose, giving us full information about the makers of this area, including many photos of trade cards, makers' marks, instruments, and makers' portraits, it is and will be for many years an invaluable compilation, as well as a model of how such a work could be laid out. I have, though, a hankering for lists of surviving instruments in the text for all makers and not just for the organ and bell makers, but perhaps this is asking for too much.

Review of: Peter & Ann Mactaggart, eds: *Musical Instruments in the 1851 Exhibition*. Mac & Me Ltd, 19 Mill Lane, Welwyn, Herts AL6 9EU. 109 pp. 16 plates. £15.00 postfree in UK; plus something for currency conversion and postage abroad.

The Great Exhibition at the Crystal Palace was one of the most successful international exhibitions that there have ever been. More than six million visitors were recorded, and the profit was such that it paid for all the land on which stand today the Imperial College, the Royal College of Music, The Science Museum, the Geological Museum, the Natural History Museum, and the Victoria & Albert Museum; for all I know it paid for the building of all these institutions, too, and it still finances research, scholarships, and post-graduate study. These facts, and much other interesting material, are to be found in the editors' introduction to this volume. They have done a great deal of editorial work, for they have collated the various different catalogues of the Exhibition, in addition to other reports and accounts, and have then rearranged the material so that, for example, all the pianos, and the materials used in piano manufacture such as soundboard wood and wire, can be found in the same section, instead of being scattered through different classes and in different national entries.

The largest single section is that for the pianos which, while they may not have been in the majority in the Exhibition, were described in more individual detail in the catalogues and other contemporary accounts. More pianos, too, appear in the illustrations here than any other instruments, perhaps reflecting the known interests of the editors (for myself, I think it a great pity that there are not more than 16 plates, and more illustrations of other types of instruments; it would both add to the interest of this publication and also help to identify some of the more curiously named instruments, to which we shall return in due course). Looking at the pictures of the pianos here, one's immediate reaction is *Gaw*. The amount of exuberant decoration is overwhelming. I know that Victoriana is becoming fashionable again, but I hope that it never gets this far!

The descriptions of the pianos range from the fantastic to the interesting. The piano-éolien of Henry Herz of Paris had bellows which directed a current of air on to any string after it had been struck and thus sustained the sound. Wm. Jenkins of London exhibited an *expanding and collapsing pianoforte for gentlemen's yachts*, and John Champion Jones, also a London maker, a *double or twin semi-cottage piano, having two fronts and sets of keys, one on either side, suitable for any number of performers, from one to six*. Pirsson of New York had a double, too, a grand with a keyboard at each end and the additional feature of tuning by machine pegs like those of a guitar or a doublebass. But on the other hand, Chickering of Boston exhibited an iron-framed instrument, as did Hornung of Copenhagen and Meyer of Philadelphia. The most interesting is Jean Henri Pape's down-striking action, which receives and merits the longest description. It is noteworthy that many of the exhi-

bitors included square pianos in their lists; as late as 1851 this was still an important pattern of piano.

Some of the organs sound quite extraordinary. One, the Amisone produced by the Florentine brothers, A. & M. Ducci, produced all the notes of its lowest, 16 foot, octave from one pipe only four feet long. Another was Robson's enharmonic organ with 42 pitches to the octave, to play in tune from eight sharps to six flats. Dawson's autophone was an early example of a mechanical organ playing from punched cards. And there were, of course, the great conventional organs of Willis, Hill, Gray & Davison and the other well-known makers. Also in this section are the reed organs, concertinas and like instruments.

The Wind Instrument section is, in some ways, the most frustrating. Many instruments are listed under patent names, names now totally forgotten, and one wonders what on earth some of these were. I am divided between gratitude to the Mactaggarts for producing this very useful compendium of what was exhibited at the Crystal Palace, and fury because it looks as though I shall have to try to find the time to investigate in more detail and try to discover just what Courtois' *curvilinear pistons* were, what were a Hell's horn (I could guess!), an Alt-vono, a Sommerophone and a Zevuhoroh. More seriously, I'd like to know why Rudall, Rose & Co, who were awarded a Prize Medal for their *Carte's Boehm patent flute* stamped *Council & Prize Medals* on the Carte model flute that was not Boehm system; the only Council Medals for wind instruments listed here went to Boehm himself and to Sax. Incidentally, it is clear from this book that saxhorn was already in common usage by 1851 for brass instruments of that type by any maker.

String instruments are mostly fairly conventional, and Vuillaume was another Council Medal winner for his method of instantaneous ageing, thus avoiding the necessity of keeping instruments for many years to mature. There were, too, some funnies such as Vuillaume's famous giant double bass, Panormo's enharmonic guitar and the Ventura instruments, but these are outnumbered by the normal bowed and plucked string instruments, including Bassett Jones's *grand triple-string Welsh harp*, which a contemporary annotator recognised as described by Mersenne in 1636.

Drums and other percussion instruments are lumped in with the Sundry Instruments & Miscellanea, some of which are very miscellaneous indeed (I won't spoil your fun by enumerating here).

Finally, we have the reports of the Jury for the musical instrument class. It must be pointed out that the notes here of medals awarded do not always correspond with the list at the end of the book, from which I have quoted above; Vuillaume here received a medal *for the excellence of his violins and other bow instruments and for his invention of the Octo-Basse*; one would like to know the source of the summary list at the end.

Taking the book as a whole, I suspect that the piano and the wind instrument sections are going to be the most useful. The first because it reveals how old-fashioned, on the whole, the

piano trade still was by the middle of the last century, and because there is more detail here for more makers and their instruments. The latter because this is just when the modern winds were coming into existence, with Boehm (who exhibited a Boehm system oboe, by the way) and Sax (not yet Distin, interestingly, although according to Langwill, they were already Sax's agents here), as well as many makers of older models.

There is a bibliography, but no index; an index of names of exhibitors would have been very useful, for often one does not know in which section to look for someone who produced more than one type of instrument. And, as I've said above, I wish there were more pictures.

FoMRHI Comm. 747

Jeremy Montagu

Review of: Stephen J. Weston, *Samuel Hughes Ophicleidist*, Edinburgh University Collection, Reid Concert Hall, Bristo Square, Edinburgh EH8 9AG. 15 pp.

This is a catalogue and history combined: the catalogue of an exhibition this summer, first at Leicester University and then in Edinburgh, of four ophicleides known, in three cases and assumed in the other, to have been associated with Hughes, who was the most famous of the later ophicleide players in London, playing for Jullien and for the Royal Italian Opera at Covent Garden and elsewhere, and of whose life and work it is a history. The instruments, all of which are Hughes's model with the keywork modifications that he designed, are all excellent instruments and the Bate example, at least, (and I think the others too) is in excellent working order.

While today the ophicleide may seem as dead as the mastodon (though there is a fairly new ensemble now devoted to its revival in England), it was an important instrument in its day, and this excellent little booklet reminds us just how famous the best players, such as Hughes, were. If you have been inclined to dismiss the ophicleide as a freak, or as just a not very interesting precursor of the tuba, read this booklet; it'll open your eyes.

FoMRHI Comm. 748

Jeremy Montagu

Review of: *Chanter: The Journal of the Bagpipe Society*, vol.1, part 1, Spring/Summer '86.

A somewhat muted welcome to a new contemporary which is quite interesting, especially Julian Goodacre's article on the Leicestershire small pipes. Muted because there is no indication of the subscription costs, nor of their address. All that I can tell you, if you want to subscribe, is that the editor is Peter Stacey and that his address was then 63 Lonsdale Road, Oxford OX2 7ES, but since he told me last time I saw him that he would be moving soon, even that may not help you (it's worth a try though).

New Grove DOMI: JK 6; Further Detailed Comments: The Gs.

(See Comms 604, 646, 671, 697 & 727 for previous comments).

Gabamboli: *He strikes the string with a stick in his right hand, modulating it with the fingers of his left.* There is no author's name, so this entry was presumably compiled by the editors, who one had assumed were both literate and musicologically educated. What do you suppose they think *modulate* means?

Gabakan: (perhaps I should say that both this and the previous instrument are Senegalese mouth bows; this entry also is anonymous). *The player . . . amplifies the sound using the oral cavity.* Certainly this is one function of the mouth with the mouth bow, but it's not the main function, which is to select different overtones of the pitch of the string as is done in our culture with the jews harp. If the editors don't know how instruments work, they should read their own Dictionary; David Rycroft describes precisely how the mouth bow functions in the entry on that instrument.

Galoubet: This, the Provençal tabor pipe, is said here to be *held in the right hand . . . while the left hand played a string drum such as the Tambourin de Béarn.* The Tambourin de Béarn is, as the name states, the Béarnais drum substitute (the Béarn is right the other end of the Pyrenees, next to the Basque country where the string drum is also used); the Provençal instrument is the tambourin, an unusually tall drum, but a true drum, not a substitute, and the one which Bizet asks for in the 'Farandole' of his *L'Arlésienne* incidental music. It's a long time since I've seen a Provençal folk music group, but my memory, and my wife's too, is that, like all other pipe and tabor players, they held the pipe in their left hands and played the drum with their right hands.

Gamelan: It is not true, today anyway, that in the Central Javanese complete gamelan the kenong, kempyang and ketuk are only used in the pelog tuning; they are all used also in slendro. Nor is it true that the kempyang is a pair of gongs; one kempyang is used with the ketuk in irregular alternation, and there is one of each instrument for each tuning. While it is true that there should be two gong ageng, the great gongs, this is the instrument most often economised on, being the most expensive, and frequently one is used for both tunings.

Gangu (ii): *The hand is not placed over the bell of this side-blown antelope horn to modify the tone but to alter the pitch.* Most African side-blown horns are played in this way to obtain more than one pitch and thus to reproduce the speech-tones of a tonal language and so communicate with their hearers.

Gardon: It may be captious to mention omissions, especially in a work of this size; nevertheless, for Western readers who are interested in music, it might have been worth pointing out that Bartók's frequent indication of a pizzicato which rebounds on

the fingerboard is a direct imitation of the playing technique of the gordon.

Gavioli: According to this article, Anselme Gavioli invented the system by which perforated cards were used for mechanical organs, as on the Jacquard loom. However, in the review I wrote yesterday of the *Instruments in the 1851 Exhibition* (for which, see elsewhere in this Q) I noted an organ exhibited there by Charles Dawson which also worked on this principle. Dawson patented his system in 1848 (no. 12,307; see pp. 162-3 in Tony Bingham's reprint of the *Abridgements of Specifications of Musical Instrument Patents* which I reviewed here a year or so ago). So Gavioli's patent was not the first, though it may well have differed from Dawson's. Incidentally, we have just had the pleasure here of hearing an organ that works in this way; one appears each year at the St. Giles Fair in Oxford, and I always go to hear it.

Gbelee: I said I wouldn't, but I can't resist it; read this: *Seven metal tongues are fastened These keys*

Gebunden: The only meaning given here is that it is German for legato. It would have been sensible also to refer to fretted clavichords.

Gedumbak: It is said of this and of other drums that their heads are braced with zigzag lacing. This of course is true, but it would be more informative if the terms that Curt Sachs used in his Madagascar Catalogue (most of which were reprinted as an appendix in his Norton/Dent *The History of Musical Instruments*) such as N-bracing, V-bracing and so on were used instead. The Sumatran version of this drum is said to have a leather head. If this is true, it is very unusual for a drum head to be tanned as leather; most are prepared in other ways.

Gemshorn: The gemshorn was NOT a medieval folk recorder. There is little evidence that it was a folk instrument and very certainly it was not a recorder (ie a flûte à neuf trous). Acoustically it is akin to an ocarina. The instruments in the photograph bear little resemblance to the surviving iconography and less to the one instrument which did survive into modern times. There is no evidence whatever that the gemshorn had a metal tuning band; we know from surviving instruments that the early 16th century recorder did not, despite what is alleged here. The whole article, a farrago of statements without any evidence to back them up, reads like an advertisement for the somewhat bogus instruments illustrated, which were made by the man who wrote it.

Genggo and Genggong: Few if any bamboo jews harps are made by splitting the bamboo; they are made by cutting it, a different technological process.

German flute: An older name for the transverse flute. . . . It depends on what you mean by older: it was in fact the last name before just *flute* was used, and the last of the adjectivally qualified names for that instrument. They were still German flutes at the 1851 exhibition, for instance.

Gestopft: Like gebunden (above) only one definition is given for a word which is used in connexion with several instruments, with a different meaning in each use.

Ghichak: A pity that the picture does not resemble any of the types described in the text; presumably the authors were not shown the plates (I use the plural because this is not the only example of this problem) and thus were not allowed the opportunity either to say yea or nay or to rewrite their text to include the particular variant shown.

Giorgi flute: I have never seen an example made of thin-walled ebony; all the Giorgi flutes that I know are made of ebonite, which is not ebony but a form of vulcanised rubber; certainly they are thin-walled, thinner than a wooden flute would normally be.

Gitar bas: I said I wouldn't, but to write *its single keyboard* in connexion with a xylophone really is going too far. Apart from the gross misuse of the English language (anonymous, ie editorial), I do not know any examples of Indonesian xylophones (nor African for that matter, nor any outside our culture except the Central American) which are not a single row.

Glasschord: This is described as a three-octave instrument with glass bars played from a keyboard (it was invented in Paris in 1785; could it have been what Mozart intended to be used in the pit for Papageno's bells? It would have sounded very like a glockenspiel and none of the descriptions, eg by Berlioz, of any instrument alleged to have been used in *The Magic Flute* have ever sounded convincing to me when I look at the score). However the article goes on *The musical uses of the glasschord . . . probably involved giving the pitch to choirs and perhaps assisting amateurs in tuning pianos . . .* Surely nobody invents and builds a three-octave instrument for such purposes? Why not for playing music on?

Glissando: The slur, referred to in the text, is missing from Ex. 1.

Goka: A side blown . . . trumpet . . . with one stop . . . in the tip.

Gong: The article doesn't really make clear the wholly artificial but important distinction in orchestral parlance in our culture, where the word gong implies an instrument of definite pitch and the word tam-tam the orchestral gong(!), the instrument without a definite pitch.

Gong ageng: The ombak, the rate of vibration or pulsation, is just as important as the pitch of this, the largest gong in the Javanese Gamelan, but I don't think that *musical beats* is a proper description for it. To say *produce a low-pitched sound (35 to 45 cycles per second (presumably Hz. is meant here) which may consist of 13 or more musical beats* does not (I am referring to the last section, after my (interjection)) either make sense (what do they mean by musical beats? The ombak is a throop! nor convey any information.

Gong-chime: The gongs are not usually *placed upright* but laid horizontally. OK, what's upright or horizontal for a small gong? I think it's in relation to the striking point, usually a protruding boss on these instruments; if the boss points up, the gong is horizontal; if it points to one side, it's upright. Still not helpful, is it. Should we agree to say placed with their bosses upwards (or hung with their bosses sideways, as the case may be; it's the former here)? I think that this would be clearer. It would also be more appropriate with the last type shown in the figures, that with the gongs on a horse-shoe shape frame, the ends of the frame rising into the air.

Gong kemodong: This is an example where the use of the word *keys* is positively misleading. The gong kemodong is a gong substitute and the point is that metal bars (or slabs) are used instead of a gong. What is not stated is that the soundbox, over which the bar or bars (they come single or double) is/are suspended, contains a large earthenware pot as a resonator.

Goong lu: This is the archaic Vietnam lithophone, which is apparently dated to c.1500 BC. I would love to know how they know its name. Perhaps I'm unfair; it's got to be called something, and calling it *goong lu* is no different from calling the Danish Bronze Age trumpets by the contemporary (when they were first discovered) Scandinavian name for an alphorn. The past participle of *hew*, by the way, is *hewn*, not *hewed*.

Goulding & Co: Were they, I wonder, *instrument makers*, or were they dealers who had instruments made for them? Many of the instruments with Goulding's name on them vary in pattern, as though they were by different makers, and I have wondered about them for some time. D'Almaine & Co, their successors, were not discontinued with D'Almaine's death; a firm of that name was in existence in Honor Oak, in South London, in the 1970s. I found them while driving past one day, and asked whether they still had all the records of the firm, but only got an evasive answer unfortunately. After a while the shop, which was an ordinary small music shop, selling general stuff, vanished, and whether they moved or were discontinued, I don't know.

Grainger, Percy: I'm surprised that there is no mention of his habit, which never caught on with other composers despite his efforts, to eliminate pretentiously foreign names for instruments in his scores. When one looks at one of his orchestral works, one realises that we have practically no English names for orchestral instruments; they all come from other languages. It's a minor point, but there's no harm in a little entertainment in so major a Dictionary!

Gruzavewonigi: This lamellaphone is described as having *nine raffia-splinted keys*. What does *raffia-splinted* mean? A splint, for example when you have a broken bone, is normally a piece of wood or whatever tied alongside the broken limb to support it and hold it firm, but surely one cannot usefully tie raffia along the lamellae; for one thing it's too soft to support a lamella in that way if it were broken, and for another I would expect it to deaden the sound. (I have a vague memory that a horse can be said to have thrown a splint, but I don't

know what that means; perhaps the word is used here in that sense, rather than in the humanly medical).

Guadagnini: A rather odd pair of statements here relating to Lorenzo Guadagnini: *The original labels ... show that his instruments were made in Piacenza. ... He may himself have lived and worked in Piacenza.* If his instruments were made there, it does seem probable that he worked there.

Guarneri ... (2) Pietro Giovanni Guarneri: In line 4 of this entry, for *his nephew (3) Pietro Guarneri*, read *his nephew (4)*...

Gugucu: This is described as a small aerophone whose narrow end is covered with a spider's web and the instrument was blown through an opening in the opposite end. I wonder, was it blown or was it sung into? The description is suspiciously like that of a mirliton (kazoo, flûte eunuque, etc), in addition to which if the web covers the only orifice apart from the blowing (singing?) hole, I'm not sure it would work if it were blown.

Guichard: Why *Even his cornets & pistons ... had ... a number of crooks ...* . Everybody's cornets at that period (in the mid-1840s) had a number of crooks. Did his clavicor have valves two horizontally mounted for the right hand and the third vertically for the left hand? Every clavicor I've seen had all three mounted horizontally (separated, yes, for the two hands but all three running the same way). Certainly the one in the plate in vol. I (illustrating Clavicor) has all three horizontal.

Guiro: Surely one cannot (or should not) refer to the serrations of this scraper as *frets*. It is, in fact, inaccurate to refer to them as *raised marks or frets* because they are not raised; they are the original surface and the gourd is cut away in between them or grooved.

That's it for this quarter; I'll leave Guitar for those better qualified than me to comment. Again I'd encourage more of you to join in this enterprise. The Dictionary is so valuable that any comments and corrections, however minor, are worth making.

Continuation of Bulletin Supplement 45 from p. 8

Incidentally, most organologists learned their acoustics from some famous textbooks that strongly imply that vortex shedding associated with the edge tone plays a significant role in maintaining the air-column oscillation in flutes and organ flue pipes. This is false. Helmholtz's original explanation has been shown to be correct. The air stream is directed alternately in and out of the column purely by the movement of air in and out of the hole (that the air stream is directed across) due to the oscillation of the air in the column itself. So air valves are controlled by the flow of air in and out of the column while lip valves and reed valves are controlled by the air pressure oscillations at their ends of the column.

Division (by F. Traficante)

This entry unfortunately covers only 17th century English viol practice, focussing primarily on Simpson's "The Division Viol". It would have been instructive to summarize Simpson's four "divers ways of expression ... (in) Breaking or Dividing a Note". These are remarkably similar to the rules of Ortiz. The extensive Continental literature on this subject is only treated in the "Improvisation" entry in this Dictionary, and there quite summarily.

Traficante seems to think that division was only a "technique of variation ... of a cantus firmus or ground ...", but the continental sources clearly state that it was applied to all melodic lines, including those in polyphony. The English keyboard and lute repertoires show that this was the case in England as well.

I can't agree with Traficante's contrast between Simpson-style dividing of a ground as an extrovert show-off activity when compared to the playing of viols in parts during the first half of the 17th century as an introspective activity. There is introspective enjoyment in exercising a skill while tackling new challenges that does not need an audience and can apply to both. Similarly the viol part music could have been (and probably was at times) heavily divided in just as showy a manner as on the division viol. Not dividing the part-music repertoire is a modern tradition with no historical basis that I am aware of.

Division Viol (by F. Traficante)

The 'viola bastarda' was not the Italian equivalent of the division viol, as stated, because the 'viola bastarda' name disappeared in the 1630s well before the division viol name appeared. A developmental relationship is clear though since they were both types of bass viol and the bastarda repertoire has strong similarities to that of the division viol. The 'violincino' was a name used in Italy from the 1630's on to the beginning of the 18th century, and so it was contemporary with the division viol. There is also a strong resemblance between the surviving repertoires. 'Violoncino' means 'small violone'. So does 'violoncello', but this name first occurred three decades later and applied to any instrument that was smaller and more agile than the violone and yet could play (with the help of an overspun lowest string) the bowed continuo part in a string band with power comparable to the violone. The 'violoncino' name first occurred well before overspun strings became available and could well have been just what the name implies, a type of bass viol. The simultaneity of the disappearance of the 'viola bastarda' name and the appearance of the 'violincino' name could well be other than a coincidence, with the instruments being essentially the same in form and musical function. Then why the change of name? If the violoncino was the Italian equivalent to the division viol, the only difference would be in tuning, and thus in training for reading music and improvising. The violoncino would be tuned in fourths with a third in the middle, like a standard viol, while the viola bastarda used various tunings, most of which involved combinations of fourths and fifths between neighbouring strings. Viols were tuned mainly in fourths and used chromatic fingering (one finger per semitone), while all members of the violin family were tuned in fifths and used diatonic fingering (one finger per diatonic note). The 'bastarda' part of the name seems to reflect the fact that the viola bastarda was functionally a cross between a viol and a violin. In inventories it was listed under either category. So the change of name could well have resulted from the abandonment of tunings including fifths and the associated mixed techniques of playing. My hypothesis then is that the division viol was an English adoption of the violoncino after the latter had developed from the viola bastarda.

Traficante courteously omits characteristics of the division viol that are distasteful to the modern viol-playing community. This includes its size, which with a 30-inch (76cm) string stop is larger than what is nowadays considered appropriate for a consort bass

viol, though contemporary sources said that the division viol was smaller than a consort bass. Also, Simpson preferred a division viol which had an Italian bass violin type of body and the division viol measured by Talbot seems also to have had such a body. This could well have been characteristic of the violoncello.

Double Bass (by R. Slatford)

The entry starts with defining the instrument as the "largest and lowest-pitched instrument of the violin family". I can't imagine any criterion that would make it a member of that family. By tuning, the most common shape, and historical development, it is a viol.

Slatford states that since "aluminium-covered steel or nylon core strings have replaced their thick gut predecessors it is arguable whether the practice of scordatura tuning (a tone higher than normal, used originally for the solo repertoire) is still necessary". The implication here is that some aspect of performing with gut strings was more appropriate for solo playing when tuned up a tone, and that this aspect does not need improvement when using modern strings. What could this aspect be? Tuning up a tone increases the power of the sound, but one can get the same increase in power at the old pitch by using heavier strings. The only way that power could be the reason for the scordatura tuning would be if less power was preferred for non-solo playing and more for solo playing. There would then be no differences here between thick gut strings and modern strings. The other candidate for this aspect is brightness of sound. Here again, one can increase the brightness of sound by the use of metal windings on gut without raising the pitch. So brightness could only be the reason for the raising of the pitch if the old players preferred a less bright sound for non-solo playing and a brighter sound for solo playing. In each of these cases, modern strings are not fundamentally any better than old gut strings, i.e. the type of string is irrelevant. Essentially, Slatford's point should be that modern players don't feel the need for contrast in power and/or brightness of sound between non-solo and solo playing that the early players felt.

The origins of the instrument are correctly traced to the appearance of large viols very early in the 16th century. An earlier candidate than the one presented as the earliest illustration is in Plate 42 in Remnant's "Musical Instruments of the West".

I wonder why Slatford chooses to divide historical tunings into two types, all 4ths and those with 3rds and 4ths. This distinction does not lead to any historical insights.

There is some confusion about the violone in the entry. Slatford does not seem to realize that the name applied to all sizes of viols in the 16th century and that when the sizes changed, it stuck to the only one of the original sizes - the bass - that was still used in mainstream music in Italy afterwards. He mistakenly includes the G to g' tuning that Praetorius gave for the 'klein bass' or bass viol as a Praetorius tuning for the violone. Praetorius only used the name 'violone' for instruments considerably larger than the bass viol. Slatford's mistake is understandable since Banchieri gave the GG to g tuning for the violone. With gut strings (without overspun basses) one can still tune the same instrument (of the size of the modern double bass) from G to g as well as from DD to d. Slatford does not mention that the DD EE A D G tuning with which he is so fascinated (because it is "only one step removed from the modern ... tuning") given by Praetorius was for a "Gar Gross Bass" (called a contrabasso in Italy), an instrument much larger than a modern double bass.

There are 9 surviving viol pieces by Gibbons including the 'great dooble base', not 2. Another quibble is that it is very unlikely that the Gasparo da Salo owned by Dragonetti now in St Marks, Venice was originally built with three strings. Three-stringed double basses only came into fashion late in the 17th century.

Surviving information on the tension on each string points to about 25 Kg in the 18th century, 50 Kg in the middle of the 19th century, 40 Kg around 1900 and 25 - 30 Kg today.

Continued on p. 35

More on Longman, Lukey & Broderip -- *Further to their Catalogue of 1775 on p.9 of the last FoRRHIQ*

There are a number of interesting details in this *Catalogue* in addition to those which Eph picked up last time.

The first is the line *Tenoroons or Vauxhumanes*. This suggests, to me at least, that there was some confusion between the tenoroon, as a small size bassoon, and the vox humana, that peculiarly English version of the tenor oboe, so much plainer in construction than any of the continental F oboes. Were the two terms ever used for the same instrument, and if so, which of the two is the one meant?

It is interesting that already there were only two bagpipes worth mentioning, the Scotch (presumably the great pipes) and the Irish (presumably the union pipes); no lowland pipes, no small pipes, and no English pipes.

Does anyone know what the *Sticcado Pastorales* were? It's in New Grove
DoMI : Ed.

And what do you suppose a *Glove Horn* was?

I must confess that I read the lines about strings differently from Eph. It looks to me as though the wired strings are also imported from Italy, and it may be that they are *silver'd in the completest Manner*, rather than wired in the completest manner; in other words, they might still be open-wound but with wire which was thoroughly silver-plated rather than perhaps less well silvered wire which may have been on the market from other firms who left part of their wire copper. Certainly piano strings at that date were still more often open wound than close, and pianos are one of the instruments listed there.

What interests me the most is the penultimate line, the one with the pointing hand, which says that among the instruments bought from the stock of Messrs Lewer and Tyther are *Instruments made and Books printed upwards of three Hundred Year since*. That's 1475 and before. If only we had a list of that material! Just think of the sort of instruments that were being used in the late fifteenth century, and for the next two centuries, all of which were way out of fashion by 1775, and for that matter think what early music prints there may have been in that stock. How much interest was it, do you suppose, to Longman, Lukey & Broderip's customers, and what happened to it all?

And to add to Eph's list of what isn't mentioned, there are hardly any percussion instruments, except for the tabor, which comes with the pipe; no triangles or tambourines, which usually appear on lists of this period (the tambourine was quite a popular lady's instrument, and I've often wondered what they played on it), only the kettle drums to go with the trumpets.

Made for Music -- The Galpin Society's 40th Anniversary

I was invited, as press (ie as FoMRHI), to the opening of the Exhibition at Sotheby's, and presented with a copy of the catalogue, which I assume meant that a review was expected; I hope so, anyway. The Catalogue, which was generously sponsored by Schott's, is still available, presumably at the cover price of £4, and presumably from the Hon. Secretary of the Society, Pauline Holden, whose address you'll find in our List of Members.

The Exhibition was very well set out, chiefly by Dave Law who paid me the compliment of coming to Oxford to see how I suspended all our instruments in the Bate Collection. I hasten to say that I got most of my ideas of how to do it from Bob Barclay and from his excellent critiques of what we saw on the CIM-CIM Scandinavian tour (the papers of that tour still have not been published, but, as the computer dealers say, they should be available real soon now (CIMCIM always takes an unconscionable time to publish anything); they will be important reading for anyone setting up an exhibition since they covered all aspects of exhibitions: aesthetics (does it look nice?), pedagogics (does it teach or show anything?), and security (is any of it going to fall down and can it be nicked?).

Some of the choices of exhibits were, shall we say, curious, and these we will discuss as we go through the catalogue. One emphasis was on the collections of the Founder Members and this was a worthwhile approach for an exhibition whose space did not allow for the quantity of instruments that we had in Edinburgh for the 21st Anniversary and whose occasion could not compete for importance with the 1951 Exhibition in conjunction with the Festival of Britain. Nevertheless, there was a certain feeling of randomness and lack of focus despite the individual importance of a number of the instruments on display.

The Catalogue itself, perhaps not too surprisingly when one considers where the exhibition was held, resembled in appearance one of Sotheby's sale catalogues, to such an extent that more than one guest at the opening remarked that all that was missing was the estimate of sale price at the end of each entry. A major lack, to my mind, is any identification of lender. Yes, I know that there are more burglars around than in 1968, but I wonder how many such people look at catalogues of musical instrument exhibitions; they aren't like exhibitions of jewelry or silver or other immediately saleable items. It means that there is comparatively little value in the catalogue as a reference work, and it would be little more than a souvenir were it not that each instrument (with a very few exceptions) is illustrated. There is a list at the end of the Catalogue of the catalogue numbers of those instruments which were lent by two major museums, the Edinburgh Collection and the Bate Collection, and very curiously many of the entries for brass instruments end with the note that they are *Loaned from the Padbrook Collection* although this does not appear as a museum at the end and no other instruments are listed in their entries as loaned from any other collection, save for a few (by no means all)

from the two museums noted above. Who, what, or where is the Padbrook Collection? And why was it singled out in this way?

As in 1968 at Edinburgh, each section of the Catalogue is prefaced by a note from an acknowledged authority on the type of instrument in question, though whether these persons were also responsible for the selection of the instruments that follow is not clear. The first group is the bowed strings, introduced by Charles Beare. The first instrument, a Francesco Linarola lira da braccio shows the problems of mounting such an exhibition: the importance of showing such an instrument must outweigh the fact that parts, here the pegbox and tail-piece, are not original. Fair enough on an instrument of this rarity, but more questionable on a Henry Jaye treble viol; surely an equivalent instrument could have been found that did not have a pegbox surmounted by a carved lion's head of 19th century German origin? Whether Mr. Beare was also responsible for the catalogue entries, I do not know; I doubt it, and it was they as much as the physical appearance of the catalogue that led to the unkind remarks quoted above; they do read very much like those of a sale catalogue. Two violins, a Mariani and the ex-Halfpenny Liessem, and the ornate Forster cello, were in original state and there were some very pretty early bows.

An important point comes out in James Tyler's introduction to the plucked instrument section, and that is the use of the spelling *guitar* for the English guitar. This is well-authenticated for its period and has more justification for use to distinguish it from the Spanish-type instrument than has the equally doubled *t* for the renaissance cornett, which we all use today to distinguish that instrument from the brass bandsman's horn. If we could all adopt it, it might mean the end of the use of *cittern* or other less accurate terms for that instrument. There was a theorbo (by Hieber and Pfanzelt) and a theorboed lute by Wendelin Venere (theorboed by Eberle), but no ordinary lutes at all. A small instrument was described as a *Choral Pandorino*; one can accept that such instruments may have been carried by the choir master and used rather in the manner of a *pochette* to give indications and details of ornamentation not written in the music, but one very much doubts if all the surviving instruments of this type, usually called either *pandurina* or Milanese mandoline, were used in this way, and one wonders what the evidence was for that use with this particular example?

The woodwind section opened with a quartet of Bressan recorders, the ex-Edgar Hunt Bate fourth and treble flutes, the tenor (which I first saw when the purchasers brought it to ask if it was valuable; they had paid £4.10s for it on the market!) with a split key so that either of the two little-finger holes could be opened individually, and the Dublin bass which also turned up fairly recently (like all the Bressan basses except perhaps for that in Prague [see my notes in *GSJ* 2]) the crook is not original). A Grenser traverso with six corps de rechange was noteworthy as were two Scherer instruments, an ivory traverso and a treble bassoon. There was a very pretty quintet of sarrusophones, unfortunately not a complete set (soprano, baritone, bass and two contrabasses) as well as some imposing

saxophones, again including a contrabass, but why not one by Sax? There are plenty around. One of the most beautiful clarinets I've ever seen was the 4-key in A by Godefroid-Adrien Rottenburgh, slim and elegant to a degree. Despite the prohibition of folk instruments, stressed in Anthony Baines's introduction to the Catalogue, there were several bagpipes.

The presence of two funnies (if I may use that term) in the brass section was my fault. I was told that the Anaconda (the name that Morley-Pegge jokingly gave the double-serpent in GSJ 12, but one which has now been taken up in all seriousness) was going to be included, so I suggested that they should also have the Basso Hibernicon; neither instrument is really important enough to justify their space in such an exhibition, even though both are unique. The double-serpent was, of course, the only instrument that interested the general press and the television and radio. Others of greater importance among the brass included the two Anthony Baines cornetts, an interesting Sax valve horn, a Distin cornet with an unusual design of rotary valves, the Shaw natural trumpet with key-changing holes from the Royal collection, described by Eric Halfpenny in GSJ 13, and Thomas Harper junior's own slide trumpet, which was sold fairly recently in that same room. It was nice, too, to see King Kong again, the double-slide contrabass trombone.

The keyboards were, on the whole, the best single section of the exhibition, with a Trasuntino single-manual harpsichord of 1574, a double-manual spinet, a Hitchcock spinet, double-manual harpsichords by Tisseran and by Wilbrook, virginals by Guarra-cino and, a motherless child, by Thomas White, and clavichords by J.A.Hass and perhaps by Horn (no fretted clavichord though), as well as a Broadwood and a Kirckmann grand and a Beck square. Finally, there was the Canon's bible regal, still in good working order as his grandson Brian, for many years the Society's chairman, proved to the assembled company.

Even after skimming through the 1951 and the 1968 catalogues, it's a little difficult to pin down just why one was left a bit unsatisfied. Perhaps it was lack of instruments by more of the great makers (only one by each Stanesby, only one Triëbert, only recorders by Bressan, no Sax among the woodwind; no Bull, no Raoux, no Hofmaster and none of the great Nuremberg makers among the brass; none of the great Flemish or French makers among the keyboards; not one lute, not even the ex-Halfpenny Hans Frei, and so many others that one could name). What was there, and of course I have only mentioned a very small proportion, was nice enough in its way; perhaps in ten years time, when we celebrate the half-century, we shall be able to speak differently.

Mersenne, Mace and Speed of Playing

In the Third Book of String Instruments, Prop. XIV (p. 190,1 in the Chapman translation and p. 137,8 in the French original), Mersenne (1636) stated that the fastest anyone can play passage work and graces on any instrument was 16 notes a second. Notation varied from a measure to a 64th of a measure, and people varied as to whether their measures lasted for 1, 2 or 4 seconds. Mersenne was (probably deliberately) ambiguous as to whether the measure was a breve or a semibreve. So any note value from a crotchet to a breve could have 1 second duration. In the discussion of fastest speed of playing, Mersenne assumed that the measure was 1 second, the time of a heartbeat pulse. Sachs (Rhythm and Tempo (1953), Norton) estimated that the pulse varies from 60 to 80 per minute. It is possible that Mersenne was comparing fastest speed with the pulse, and the second was only an estimate of the pulse time. Then the fastest speed more accurately would be 16-21 notes per second. Mersenne did not consider a tempo not related to the pulse, so neither will I. This separates all possible tempi into bands (e.g. 60-80 and 120-160 beats per minute) appropriate for binary music (what Mersenne was concerned with at the time), alternating with bands (e.g. 90-120 beats per minute) appropriate for ternary music.

Of course, it is likely that most musicians did not play their fastest notes as fast as is humanly possible. Mersenne made the above observation of a maximum speed by listening to "those who are esteemed to have a very fast and light hand when they use all of the speed possible for them." Reports of such musicians who were esteemed for speed are rare for the Renaissance or Baroque. More typical are reports of musicians being esteemed for inventiveness. So it is likely that the majority of musicians, who were not esteemed for speed, played no faster than rather less than 16-21 per second. If their fastest notes were semiquavers, their pulse was probably the minim, and if their shortest notes were demisemiquavers, their pulse was probably the crotchet.

Let us illustrate this by looking at Mace's "Musick's Monument". The fastest notes Mace notated were demisemiquavers. On p.79-81, Mace described a pendulum for time keeping made of a string attached on one end to a "Hook or Nail (fixed) to the Top of the Seiling" and at the other end to a "weight of half a Pound or a Pound" so that it "may well-nigh touch the bottom of the Floor." One starts the pendulum off by holding the weight to one side "so high as you can reach". I am a little under 6ft tall and my highest reach is 2.3m. A short man 5ft 2in tall would reach about 2.0m. The length of the pendulum must be longer than this and I estimate it to be 2.5 to 4.0m.

The frequency of a pendulum is $\sqrt{g/L} / 2\pi$ where $g = 9.8\text{m/sec}^2$ and L is the length in meters. This frequency is in full swings per second, and needs to be multiplied by 60 to give swings per minute or metronome marking. It also needs to be multiplied by 4 for the beat, since Mace stated that one counts 4 beats for each full swing. The result is that the beat is from 60 to 76 per minute (for $L=4.0$ and 2.5m respectively), appropriate values for the pulse. Mace stated that the full swing is the semibreve, so each beat is a crotchet. The discussion just previous to this section indicated that a semibreve = 2 minims, a minim = crotchets, etc. The fastest time value mentioned was a semiquaver. The demisemiquavers that appear in the music were truly exceptional and not considered worth mentioning in a general discussion of musical notation. They were as fast as Mace ever wanted to play. The pendulum information indicates that Mace's demisemiquavers were 8 to 10 per second. This is just what one would expect from a musician who was not a speed specialist.

Mace mentioned that the pendulum string should be particularly long to practice with at first, implying that a shorter string (and faster tempo) would sometimes be appropriate later. It is unlikely that the faster beat exceeded 80 per minute, in which case the string length would be no shorter than 2.2 meters. Concerning playing particularly fast divisions, Mace criticized most performers, including Masters, for breaking time and playing too fast. Playing as fast as possible was clearly not of musical interest to him, nor probably to most musicians in those times.

In the Renaissance and Baroque the pulse was beaten as alternating down and up motions of the hand, and the tactus included 2 pulses, a complete cycle of down and up. The standard tactus was alla semibreve with 2 minim pulses in the tactus. Proportio dupla or diminutio had 2 semibreve pulses (the same heart pulse) in the alla breve tactus. Proportio subdupla or augmentatio had 2 crotchet pulses in the alla minima tactus. These three notation conventions, with the semibreve, minim and crotchet versions of the pulse, correspond with the above-mentioned writings of Mersenne if his measure was the semibreve. Sachs (from whom this discussion is taken) indicates that there is no consistent relationship between the notations C and ♩ and which tactus is intended.

There were two kinds of ternary tactus, the tripius where there were 3 minim beats in one pulse, and the sesquialter where there were 3 minim beats in the full tactus (or two pulses). Ternary tactus was also used in alla breve and alla minima notation. When Mace wrote in ternary time, his smallest time value was the semiquaver. This music has 3 crotchets to the bar, so there are 12 semiquavers in the bar. If it was in tripius there would be 12 notes to the pulse, and if it was in sesquialter there would be 6 notes per pulse. Since his fastest notes in duple time were 8 notes per pulse, this music was most probably in sesquialter. When Mace wrote down a galliard, he had 6 crotchets in a bar. If he was consistent with his tempo and properly observed the expected sesquialter relationship, each crotchet corresponded with one step of the dance and it moved at 90 to 114 per minute.

When we have music in duple time, the speed can be doubled or halved with different time values corresponding to the pulse. The situation can be more restricted with music in ternary time where there is no doubt as to the identity of the three beats. Let us consider the galliard in England c. 1600. There usually were 8 or 16 groups of 3 minims in each strain. The steps of the dance cover the time for 6 steps. The only ambiguity here is whether each step corresponded to a minim or a crotchet of music. The fastest notes in galliards were usually 8 to the minim and very occasionally 16. With 8 to the minim the speed could just have been in sesquialter with respect to the pulse, with the minim at 90 to 120 to the minute and the fastest notes 12 to 16 per second. With 16 to the minim, the minim could be no faster than the pulse.

But galliards were very often closely associated with pavans, which leads to the expectation of a sesquialter relationship. A strain of the pavan usually had 8 or 16 groups of four minims each. The fastest notes were quite often 16 to the minim. If we assume a minim pulse, we can have 60 to 80 minims per minute and the fastest notes at 16-21 per second. But for most musicians, it seems more realistic to assume that the pulse was a crotchet, which gives the fastest notes at 8 to 11 per second, in line with Mace's fastest speed. In sesquialter relationship with this pavan speed, the galliard fastest notes would be ordinarily at 6-8 per second and exceptionally at 12-16 per second. This relates to Mersenne's maximum speed very satisfactorily.

Dancers I've worked with have taken the galliard at from 50 to 150 steps per minute. With the above conclusion that the galliard's crotchets were at 90-120 per minute (and minims at 45-60 per minute), it seems that the slow-stepping dancers could be accompanied by a minim per step, and the faster-stepping dancers by a crotchet per step (I wonder about what dance those who step at over 120 per minute are doing).

It thus seems that the speed limit mentioned by Mersenne leads to tempi for the galliard and pavan which are often at variance with modern practice. Is there any historical information supporting the modern aesthetic judgement that the pulse corresponds to the minim in the pavan and usually elsewhere in the English c.1600 instrumental repertoire? Above is evidence supporting the crotchet. Modern early musicians will find this result musically tolerable only when they learn to put life into the music by adding the proper unwritten gracing, uneven rhythms, etc. that were normal at the time.

A Bibliography of 18th-Century Sources Relating
To Crafts, Manufacturing, and Technology

Correspondents to this Quarterly have frequently stressed the utility of using documentary materials as a means of recapturing and duplicating instrument-making technologies appropriate to the production of historically accurate instruments. As a by-product of research editing an 18th-century clavichord-building treatise, I offer this bibliography as--at least--a starting point for researchers attempting to locate such historical sources relevant to the techniques and materials of instrument building. Due to the nature of the initial project, the list is focussed primarily on 18th century sources.

Académie royale des sciences, Paris. Descriptions des arts et métiers, faites ou approuvées par messieurs de l'Académie royale des sciences. 84 parts (1761-89). Reissued in 1771-83.

----- . Schauplatz der Künste und Handwerke. 20 vols. (1762-95). Translation of the above by von Justi, Schreiber, et al.

Barrow, John. Dictionarium Polygraphium. 2 vols. (1735). Second edition in 1758.

Beckmann, Johann. Anleitung zur Technologie (1777). At least five later editions.

----- . "Beiträge zur genauern Bestimmung einiger ausländischen Holzarten." Der Naturforscher 9 (1776):225-40.

----- . Beiträge zur Geschichte der Erfindungen. 5 vols. (1786-1805). Numerous later editions and translations.

"Beiträge zur Kenntniss fremder Holzarten." Forst- und Jagd-bibliothek. 2 Stück, No. 4 (1788).

Bischof, Carl August L. Physisch-technologisches Handbuch. 2 parts (1791).

Cancrinus, Franz Ludwig. Beschreibung der vorzüglichsten Bergwerken (1767).

Chambers, Ephraim. Cyclopaedia; Or, an Universal Dictionary of Arts and Sciences. 2 vols. (1728); supplement in 1753. Several later editions.

- Chomel, Noël. Dictionnaire oeconomique. 2 vols. (1709). Many later editions. Best edition: 4th edition with supplement. 4 vols. (1741-43). English translation in 2 vols. (1725).
- Crocker, Temple Henry, Thomas Williams, and Samuel Clark. The Complete Dictionary of Arts and Sciences. In which . . . the Difficulties attending the Acquisition of Every Art, whether Liberal or Mechanical, are removed. 3 vols. (1765-66).
- Dictionnaire portatif de commerce, contenant la connoissance des marchandises de tout les pays . . . les arts, les manufactures, les fabriques. 7 vols. (1761-62). Later edition in 4 vols. (1770).
- Diderot, Denis, ed. Encyclopédie ou dictionnaire raisonné des sciences, des arts, et des métiers. 35 vols. (1751-80). Several later editions.
- Donndorf, Johann August. "Wie wird der Drath gemacht?" Natur und Kunst (1793):488.
- Dossie, Robert. The Handmaid to the Arts (1758). New, enlarged edition in 2 vols. (1796).
- Encyclopedia Britannica (1768-71). Many later editions.
- Encyclopédie méthodique. Arts et métiers mécaniques. 8 vols. (1782-91).
- Encyclopédie méthodique. Commerce. 3 vols. (1783-84).
- Encyclopédie oeconomique. 16 vols. (1770-71).
- Evelyn, John. Silva, Or a Discourse of Forest Trees (1664). Many later editions in 18th century.
- Felibien, André. Des principes de l'architecture, de la sculpture, de la peinture, et des autres arts qui en dépendent (1676). Many later editions.
- Funke, Karl Phillipp. Naturgeschichte und Technologie für Lehrer in Schulen und für Liebhaber dieser Wissenschaften. 2nd improved ed. (1794). Several later editions.
- Geissler, J. G. Allgemeines Repertorium zur praktischen Beförderung der Künste und Manufakturen aus den vorzüglichsten Schriften. 2 vols. (1797-98).
- A General Dictionary of Arts and Sciences. Ed. by James Scott, Charles Green, William Falconer, and James Mender. 2 vols. (1765-66).

- [Guélard, J. B.] Description abrégée des principaux arts et métiers et des instrumens qui leurs sont propres, le tout détaillée par figures [?1743]. Later edition in 1774.
- Halle, Johann Samuel. Werkstätte der heutigen Künste. 4 vols. (1761-65).
- Harris, John. Lexicon Technicum: Or, An Universal English Dictionary of Arts and Sciences. 2 vols. (1704); supplement in 1744. Several later editions.
- Heinsius, Johann Samuel. Allgemeine Schatz-Kammer der Kauffmannschaft oder vollständiges Lexicon aller Handlungen und Gewerbe. 5 vols. (1741-43).
- Hildt, Johann Adolph. Beschreibung in- und ausländischer Holzarten. 2 parts. (1798-99).
- Sammlung in- und ausländischer Holzarten [?1797].
- Jacobsson, Johann Karl Gottfried. Technologisches Wörterbuch. 8 vols. (1781-95).
- Jung, Johann Heinrich. Versuch eines Lehrbuchs der Fabrikwissenschaft (1785).
- Justi, Johann Heinrich Gottlob von. Vollständige Abhandlung von den Manufacturen und Fabriken. 2 vols. (1758-61). Several later editions.
- Karmarsch, Karl. (See Precht1, Technologische Encyclopädie, to which he contributed.)
- Krünitz, Johann Georg. Oeconomische Encyclopädie. 242 vols. (1773-1858). Several later editions.
- Lewis, William. Commercium Philosophico-Technicum; Or, the Philosophical Commerce of Arts (1763). Another edition in 1765.
- Ludovici, Carl Günther. Eröffnete Akademie der Kaufleute, oder vollständiges Kaufmanns-Lexicon. 5 vols. (1752-56). Second edition (1767-68).
- Macquer, Pierre J. Dictionnaire portatif des arts et métiers. 3 vols. (1766-67).
- The Modern Dictionary of Arts and Sciences. Ed. by Percival Proctor and William Castieau. 4 vols. (1774).
- Moxon, Joseph. Mechanick Exercises, or the Doctrine of Handy-Works. 2 vols. (1677-83). Several later editions.

- Nagel, Michael Theodor. Tabellarisch Uebersicht der vorzüglichsten Künste (1792).
- A New and Complete Dictionary of Arts and Sciences. 4 vols. (1754-55). [Better known as Owen's Dictionary--after its publisher William Owen.] Second, enlarged edition (1763-64).
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Continuation of Comm 750 from p.24

Drone (by A.C. Baines)

The entry ends by the statement "The drone probably became established during the early growth of musical systems in Western Asia, though there is no strong evidence for it before Hellenistic times, when it had a place in at least some kinds of popular music (see BAGPIPE)." In the entry under BAGPIPE, contributed to by Baines, is the statement "The independent drone is mentioned in sources from the second half of the 13th century ...". Which shall we believe? What is the strong evidence for the drone in some kinds of popular music in Hellenistic times? This issue is a very important one in understanding the evolution of music. Was the drone used from ancient times (as heterophony seems to have been) or was it an early type of polyphony (on a par with organum) developed in the middle ages and perhaps related to the emergence of the bow and the fiddle? Perhaps Tony can give us a Comin on the evidence.

What has gone wrong with the Early Music movement?

In common with a great many others who were early music buffs in the 60s and 70s I am rather fed up with the state of early music today. Poorly attended concerts are evidence for this state of affairs, as are the decreasing memberships of a number of societies, such as the Lute Society.

On the face of it, people like me should be delighted - all the things we dreamt of, and more, have come to fruition:

- Musicians are playing with authentic technique and a fine sense of musicianship.
- Historically accurate instrumentation is now the norm - even for late 18th century music.
- General purpose early instruments are not much used now.
- Proper strings are available.

So why are we so pissed off? The reasons are hard to identify; but I suspect there is more to it than just an outbreak of apathy. Factors which have affected me, personally, are listed below. These may be familiar to some of you (?):

- Amateur enthusiasts of my generation were attracted primarily by instrumental music. Most performances, nowadays, are dominated by vocal music; often performed with little attempt at authentic vocal technique or pronunciation.
- Amateurs and semi-professionals now have less opportunity to contribute by way of public performance and research; these activities are now dominated by professionals.
- The excellent summer schools which flourished in the late 60s and 70s (- I am thinking particularly of the Lute Society summer school -) have died the death because of -
 - little enthusiasm on the part of the organisers,
 - the reluctance of professionals to donate their services at attractive rates,
 - and the proliferation of less good summer schools, sapping the strength of the good ones.
- Research results in the 70s led to startling changes in the sounds of instruments and performance practice. Current research results are more likely to result in yawns than in gasps of amazement.
- Attention in the glossy mag has moved, increasingly, away from small scale performances to large scale ones, which are much less easy for amateurs to emulate.

It is my firmly held belief that unless amateurs can become more actively involved, in a satisfying way, in early music then public interest will continue to wane. Amateurs form the hard core of audiences and of a customer base for luthiers. It is therefore in all our interests to rekindle the spark.

How can it be done? I remember Eph Segerman saying, some years ago, that it was a pity that early music had such a 'concert hall' image. If only a 'folk club' paradigm could have been adopted the numbers involved and audience participation would be much greater. After all, the folk scene rose to prominence before the early music revival, but unlike early music it has retained a strong, loyal following as it has evolved.

Have we missed our opportunity?

Do we really want to do something about it?

Would we rather remain exclusive, obscure and rather dull?

FoMRHI Comm 756

Bill Samson

What is a 'Simple' lute?

Reading Ian Harwood's plea for quickly made, inexpensive, but musically fine instruments (in the catalogue of the Crafts Council's Musical Instruments exhibition) I was reminded of FoMRHI Comms 216 and 217 with their strongly expressed arguments for and against simplified designs.

Harwood's article helps to clarify the difference between a 'simple' instrument and a 'simplified' one. The Old Ones undoubtedly earned a living primarily by making instruments quickly, and in high volumes. In what sense were these instruments simple? If, as I believe, we should emulate the Old Ones as closely as possible, how should we approach the design and construction of simple instruments?

Modern makers who have made student lutes have, with a few exceptions, worked to a very plain design which has a simplified rose and peg heads. On the other hand, these instruments are usually beautifully finished with flawless surfaces and perfect symmetry. I call this the G-Plan paradigm. (No cracks, please, about F-Plan wind instruments.)

The Old Ones, on the other hand, made instruments with complex roses, quickly cut and lacking finish, and fancy pegs - again lacking finish. In addition, they often applied fake inlay, in the form of scribed or inked lines - violins often had fake purfling. Cheap wood was stained black to look like ebony. Little care was taken over symmetry. The insides of lute bodies are often unbelievably crude. Nevertheless, it is likely that these instruments were perfectly playable and used by a wide variety of musicians at the time.

Such faking and lack of attention to finish seems to be anathema to today's makers. Nevertheless it is quite difficult to tell an old cheap instrument from an expensive one at even a moderate distance. On the other hand, a modern cheap lute can be spotted at 1000 paces.

In summary, and (I hope) to provoke discussion, I suggest the following guidelines for the production of cheap, authentic lutes:

1. Cut complex roses, but don't worry about their finish.
2. Make fancy pegs, but don't be too fussy about getting them identical.
3. Leave the inside rough - speed is of the essence.
4. Forget about inlaid edging around the soundboard.
5. Use cheap wood, staining it to look like the real thing.
6. Fake inlay with ink, paint or scored lines.
7. Make several instruments at the same time.
8. On the other hand, put in the effort where it counts - in the action and playing qualities of the instrument.

In this way, makers might overcome the 20th century prejudices that make lutes the province of professionals and well-off amateurs - their prices being sufficiently off-putting to discourage a wider customer base.

Makers might do well to study the working practices of traditional instrument makers in non-Western countries to achieve higher rates of production. There would then remain only the task of finding and educating potential customers, but that's another story . . .

Continuation of Comm 757 from p. 41

Rembouts, 'Le Due', Kansas University Museum
 Ryckaert, 'Hausmusik' 1650, Vaduz.
 Boullegne, 'Gypsy guitarist', Uffizi.
 Netscher (?), 'Lady guitarist', 1680, Boston.
 Jan 1 van Kessel, 'Allegory', Louviers.
 Baschensis, 'Nature morte', Wadworth Athenaeum, Hartford.
 Daret, 'Guitar player', Musée Granet, Aix-en-Provence.
 Caravaggio (?), 'Due', location unknown.
 Coques, 'Family group by a fountain' c.1660, Wallace Collection.
 Vermeer, 'Guitar player', Kenwood House.

Instruments include the guitar by Stradivari in Oxford; and that by Choce in the Paris Conservatoire, where the stings are extended to join the belly decoration.

A reply to Comm 742

Having over the years learnt a great deal from Eph it is with some trepidation that I venture to cross swords with him. The differences between us would seem to be of approach. As a musicologist, Eph's research and communications can be open-ended. As an instrument maker, asked to make a particular instrument, mine have to reach definite conclusions. Some of these conclusions may be proven wrong, and I expect that the citterns, banderas, erpharions, vihuelas, vicles and guitars made in ten or twenty years time may be different from those that I and others are making now, just as today's lutes are different from those of ten or twenty years ago. However it is necessary to make decisions in order to produce an instrument and those decisions have to be based upon current knowledge. Eph might prefer that reconstructions should not be made, but unless present-day musicians' demands are answered by the making of instruments, the concomitant research and Eph's *raison d'être* will vanish.

As Eph has raised some questions concerning my articles it seems best to deal with them under his headings.

Cut-away necks and reversal on wood-blocks

It is perhaps not generally realised how few representations of English citterns exist. I would be very grateful for information about others. All that I know -

Gilling castle, Yorks, c. 1585. Wall painting. Includes two citterns painted in a fairly naive style. Balusters are clearly shown on one. Both are viewed from the treble side so no evidence on cut-away.

Henry Unton portrait, c. 1596, National Portrait Gallery. Almost certainly a small cittern. Details are obscured by the small size of the area of picture occupied by the consort - rather less than a post-card, however the cittern appears to have sagittal pegs. Viewed from treble side.

Crathes Castle, near Aberdeen (so really Scottish) dated 1599. Jester's head. Viewed frontally.

Eglantine table, Hardwick Hall, 1568. Marquetry. Full size, three strings on third course, no balusters, colour ceded frets. Viewed from treble side.

Robinson's instruction book, 1609. Wood-block print. Viewed from the bass side with no cut-away shown, but as evidence it is tempered by the partially reversed block of the fourteen course cittern, where the treble side of the fingerboard is adjacent to the bass courses implying unreliability on the part of the draughtsman/engraver. Three strings on the second course. This could be the small cittern or intended as either. (More sales). The long-stretch chords in both this book and Helberne's could easily be adapted by a player sufficient of a musician to have reached the stage of needing to play them. (Suggestion from Enzo Puzzovio).

Fludd, 'De Naturae Simia..', 1618. Wood-block print. Viewed from bass side but over-inked in the copy illustrated by Joscelyn Godwin in G.S.J. 1973, so that no detail can be seen. Both it and other instruments seem, in any case, to be rather naively drawn.

Praetorius, 1620. Wood-block print. 'klein Englisch zitterlein'. The fingerboard is reversed, suggesting that the whole instrument may be.

Francis Barlow. Ink and wash drawing for Playford. Unclear.

Playford, 1666. Fingerboard reversed. (Engraving).

Randle Holmes' notes, c. 1688. A naive drawing showing insufficient detail.

Grinling Gibbons (?) Wood-carving. Obscured by other instruments.

Eph states (Comm 698) that there is no evidence for the use of a cut-away in England (or France). Similarly I would contend that there is no contrary evidence either, so that Eph's statement is without foundation. Certainly cut-away necks were known, as Eph himself says, because of the tradition of Italian musicians at the English Court, and also because Francis Palmer could put one on an orpharion, even if for a Metro Goldwyn Mayer travelling musician. My personal feeling is that there is no reason for citterns used in England to have been different in this way from the rest of Europe - many were, in any case, imported. The use of colour coded frets in England also implies connections with Continental practice.

Obviously citterns, orpharions and bandoras are all wire-strung. However they do fulfil different functions and work in different ways, so that it is dangerous to carry over evidence from the orpharion and bandora to the cittern. The orpharion and bandora work like lutes, (Barley - 'a more gentle and drawing stroke') and were the invention of a particular maker. Citterns, like most instruments, developed slowly, and have an entirely different function and technique. It would seem logical that the bandora and orpharion should have necks like a lute (or viol) - as the Helmingham instrument - and the Palmer orpharion could well have been exceptional in this respect.

About France-flemish citterns there can however surely be no doubt. Cut-away necks ARE shown in Le Roy 1565, Phalèse 1570, 1582, Mersenne 1636, 1648 (twice), Kargel 1578. They can also be seen clearly in paintings of the period as a glance through Buchner, etc, should show. For example Jan Molenær's 'Family making music', Frans Hals Museum, Haarlem, and Jan Massys' 'Joyeuse Réunion', Stockholm. Also on the instrument in Brussels already cited, and on V. & A. 10/2, where the original diatonic wedges beneath the later re-fretting seem to indicate France-flemish origin. I hope that the balance of evidence is now clearer.

Connection between the long-necked lute (saz, tanbur, etc.) & cittern.

I have not particularly studied the origin of the long-necked lute. Others have. I merely pointed out some similarities. Eph has pointed out others.

Fret blocks

I believe that there is no disagreement between us.

Chitarra battente

I thought that my article clearly stated the difference between a converted guitar and a scratch-built chitarra battente. Chitarra battentes are deeper, often made of walnut. Conversions are shallower and evidence of conversion can usually be seen :

- A. on the side decoration at the point where the belly is angled.
- B. on the fingerboard where decorative plaques no longer fit, and sometimes :
- C. where a neck shortened at the peg-head has become too thick to fit the peg-head properly.
- D. by inappropriate placement of end-fastenings, relative to decoration and/or strength.

Most conversions were not done with the intention to deceive, but in order to save the price of a new instrument or retain the decorative or other qualities of an old one. It is not 'fantastically optimistic' to suggest that most present-day craftsmen, having looked at a few instruments, should be able to separate one from the other.

Raimondi engraving

As the arm appearing to go through the instrument is so obvious to myself and others to whom I have shown the engraving, I am only surprised that Eph cannot see it. Looking again at a largish reproduction (Barry Mason, Purcell Room poster) it even seems that the plate itself has been altered (to make the musician into a mere sculptural form) at the point that I suggested - immediately above the bridge - where a faint white line is suggested by breaks in the hatching possibly caused by the hardening occurring in a plate when it is scraped and raised. This line also connects with the treble side of the belly of the instrument, beyond the player's sleeve, rather better than the present outline which is disjunct at this point.

Campi drawing

No disagreement but see Donald Gill's article in Early Music, October 1981.

Number of frets on the viola

Whilst agreeing that some musicians have always done different, I would refer to the articles by Donald Gill quoted above, and by Antonio Corona Alcalde quoted previously. On the one occasion on which I have been privileged to attempt a reconstruction I placed ten frets on the neck to accord with the following evidence:

paintings by	Girolamo dai Libri, National Gallery, London.
	Mazzoline or Coltellini, Ferrara.
	Retable attrib. Maestro Perea, Valencia. (vihuela?)
	Signorelli, Orvieto.
	Cariani, Musee di Palazzo Venezia, Rome.
	Pinturricchio, Vatican.
intarsia	Ducal Palace, Mantua.
engraving	Raimondi.

Obviously I mentioned only the ten frets of the Spanish 4-course guitar because of the Bermude context and because of the eight on the French (Phalese and Mersenne) instrument. I knew of no evidence either way for the four course guitar in Italy.

Conversion of vihuela to guitar

The Spanish heel design of the early Italian guitar precludes conversion, on the instruments that I have seen, because it would necessitate the addition of wood, which has not occurred. This is not to say that it could never have taken place, merely that it would necessitate replacing the neck and sides and refitting these to the back and front - a difficult task and probably more expensive than the purchase of a new instrument designed for its purpose. Most conversions involve merely the removal of wood (except perhaps lute necks), and certainly are as simple as the craftsman can make them. The addition of wood, particularly where it is disguised, begins to suggest possible falsification.

'Lute' stings

I never disliked Eph's suggestion; merely added a further one. Whilst they are usual on lutes, they also occur on some paintings of guitars. Frets are often tied past the fingerboard on guitars and unless, as in fact is usual, inlay surrounds the edge of the belly and neck, some protection for the edge of the neck is necessary, and stings are, with the lutes' example, a suitable termination for this protection. Some of the following examples do, and some do not, have belly edge inlay as well.

Continued on p. 38

FoMRHI Comm. 758

Donald Gill

A Follow-on to Comm.739

These tracings seem to speak for themselves and don't need a commentary; any modifications to the outlines are noted.

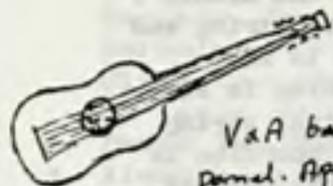
I have included nothing related to the Campi drawing as I made my views known on it and the close relative in the Ducal Palace at Mantua in Early Music Oct 1981.

The Raimondi
viola with neck/
body proportions
corrected

Viola from C. dei
Libri Madonna &
Child & St. Anne
(Nat. Gallery)



Achillini with his viola outline corrected (Raimondi after Francia)



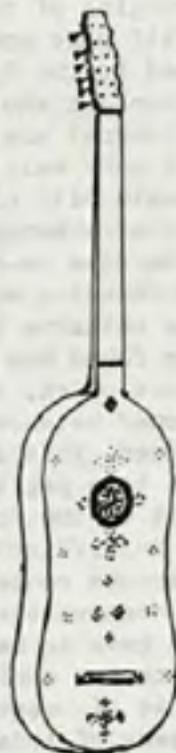
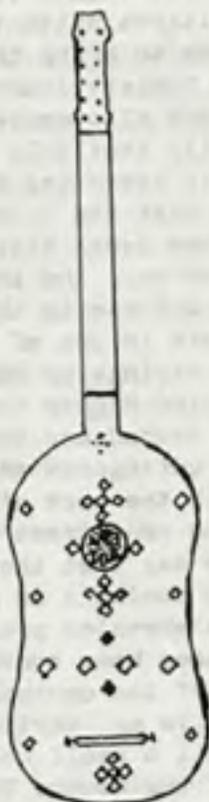
(13)
V&A bar celij
pannel. Apollo & the Muses.
c. 1570.



Fresco, Orvieto
Cathedral.
(Lucasignorelli)

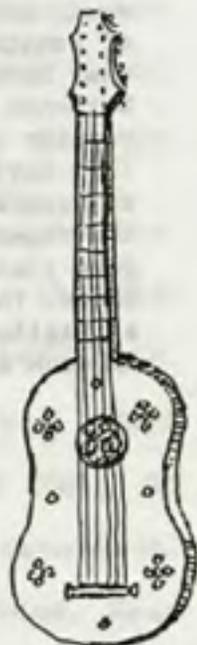


Fresco, Church of St. Maria della
Carotaggione, Ferrara.



The Paris lute has a
10 foot length neck.
(Musée Jacquemart-André)

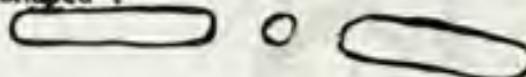
Luís de Tolosa
El Maestro



neck restored to
centre line.

In his comm 741 Donald Gill thinks ...'it is a pity' that I did not discuss the stringing of the Chitarra Battente in my Comm 709. The main purpose of my half page comm. was to bring the 31 pages of detailed finding published in the Galpin Society Journal XXXVIII to the attention of FoMRHI members who are not also members of the Galpin Society. Copies of the Journal are readily available from the Society and can also be found in many main public libraries. However, some comment is required when Donald Gill claims that the Tuccu/Ricci research "reveals that the folk chitarra battente has equal sized strings throughout and is tuned in the baroque re-entrant way, the lowest course being in the middle". My understanding of the article is that present day players string and tune the chitarra battente in one of two ways. That which is most commonly found has four strings or courses. The fourth string is at the lowest pitch; the third higher than the second. A central string (positioned between the second and third course) called a scordino is often added. This is an unfingered string and is the highest pitched, fastened to a peg through the neck at the seventh fret. This is very different to the 'baroque re-entrant way' to which Donald Gill presumably refers. Tucci/Ricci also say that the 'five-course chitarra battente (with baroque re-entrant tuning)' is no longer much in demand, and is rather uncommon among Calabresian peasants. Older instruments that have survived have in many cases been converted to the four string type, often with the addition of the centrally placed high pitched scordino.

As I mentioned in my earlier Comm., the report states that the players of today drill a small hole in each side of the chitarra battente at the point of the bouts. These holes called 'orecchie' (ears) are drilled when "...the sonority of the instrument is not considered 'open' enough; the players say the ears 'give vent to the sound'". Peter Forrester (Comm.739) suggests that these tiny holes are probably due to a particular mode of construction. This may well have been the case in the past. If so, the question arises whether the practice of the present day player who continues to drill a hole in each side of the chitarra battente has any determinable acoustic function, or is merely a continuation of a tradition. It would be interesting if Peter Forrester would enlarge upon the part these holes might have played in the process of construction. Certainly when I have seen these holes in early instruments they have been filled in. In my own collection both an early chitarra battente and a chitariglia have these filled-in holes. I have also seen similar holes in early Spanish guitars. Guitars by Francisco Sarguino 1770 Seville and Juan Pages 1790 Cadiz in my collection have them, as do several other guitars I have examined which were built by members of the Pages family. On the other hand, it is also interesting to note that some Italian mandolins built around 1900 also have 'soundholes' in the sides. The most prominent being in instruments built by Giovanni de Meglio e figlio of Naples. These have holes shaped :



FoMRHI Comm. 760

Bob Barclay

I was very interested to read Jeremy Montagu's observations in Comm 722, "On the Skill of Nürnberg Brass Instrument Makers", regarding a pair of very fine Leichamschneider horns which he was fortunate to examine. I would like to add a few observations to his if I may:

Firstly, one should be careful not to confuse the work of the Leichamschneiders with that of the Nürnberg craftsmen; although their instruments do have superficial similarities, there are many differences in detail which characterise the Viennese instruments. Enough to regard them as, indeed, a separate school. Thus the final statement of the Comm "...the Nürnberg makers seem to show skills undreamed of by their contemporaries in other horn making centres" is clearly contradictory.

Secondly, in light of these superficial similarities, it can be stated that the two and only two-joint construction is normal for Nürnberg horns. I don't see that this type of construction, using continuously tapered tubing as opposed to an assembly of short cylindrical pieces, requires any more skill and, in fact, is to be preferred as being much less labour-intensive. Personally, I prefer to make tubing on tapered mandrels as they are much easier to insert and remove. Making a mandrel for the first joint would present no problems with the equipment then available and would perhaps take half a day. One would begin with a reasonably ductile, cylindrical rod of the required larger diameter and draw this down through a plate in stepped increments ending with the final drawing at the smaller diameter. This "stepped cone" would then have its steps draw filed off thus becoming completely conical. A case hardening in a bone carbon flux would complete the job. As no hammering is done on this, or any other mandrel, with anything but a wood mallet, it would last for literally years. Although I know of no supporting evidence, I would not be surprised if making mandrels, like other patterns, was the apprentice's first job before even touching a piece of brass.

Finally, yes, I agree wholeheartedly that the skill of the brass instrument makers leaves us in awe of their craft. When one considers the intractability of the material, they certainly made it jump through hoops!

Comm. 761

Bore Gauging - Some Ideas and Suggestions.

Ken Williams.

Jeremy's Comm 733 raises again the problems involved in selecting tools. In my opinion consensus on this subject is not likely to be achieved by keeping on debate about tool materials and hardness, in fact the only relevant hardness is that of the material between the ears of the measurer.

The criteria should surely be those of bearing load on the instrument wall and the prevention of damage such as abrasion during the measurement procedure.

As Jeremy noted, if the tool is softer than the bore structure it's useless, hence the tool is always harder, the actual degree becoming unimportant.

Surface finish and profile are however critical, and combine with bearing load and the TLC of the measurer to define the parameters.

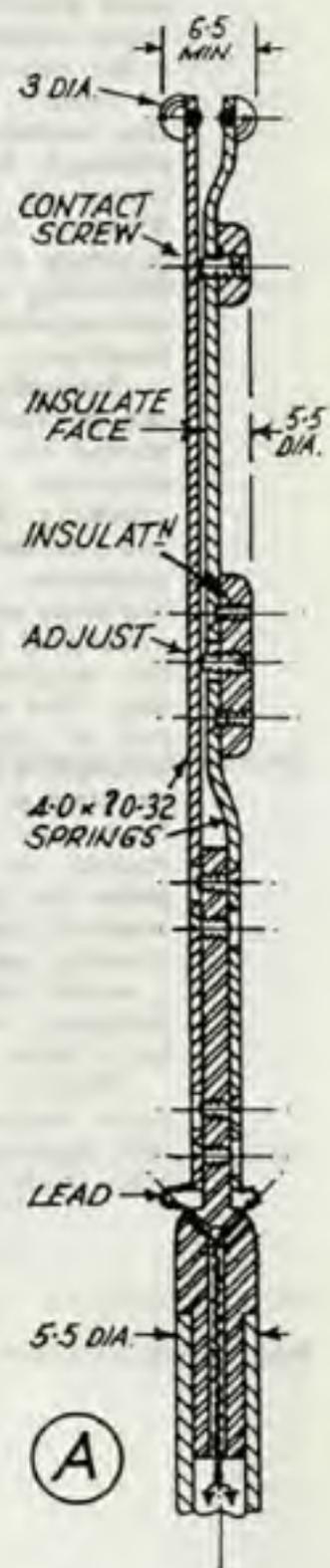
Tool material choice should be based mainly on the ease of providing and maintaining an acceptable surface finish, the frequently proposed plastics are in some cases difficult to polish to an accurate shape and are prone to scratches during handling.

The shape of the tool must preclude damaging contact with bore irregularities such as junction steps at reamer changes, and most important is minimising the bearing load on the instrument wall at contact.

An included angle of $1^{\circ}10'$ will commonly be found in an oboe top joint and the insertion of a fixed gauge with spherical ends will result in a radial pressure on the wall of about 50 times the force with which the gauge is inserted axially. As the contact area is initially extremely small the pressure/area loading is proportionally extreme. Incidentally the radial loading of a typical Mitutoyo gauge sprung into a bore is around 120 grams.

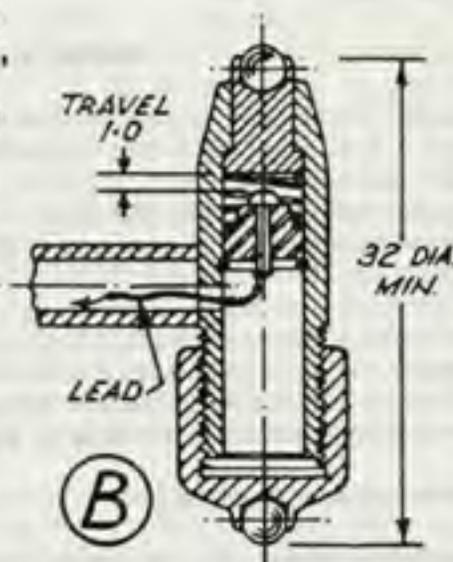
These sketches illustrate an approach which I think could be worth developing.

Contact surfaces are standard ball bearing balls, spring mounted to limit contact pressure to around 5 grams, closing an electrical contact to signal the exact moment of touch. To obtain maximum sensitivity, with minimal erosion of the contact area the contacts switch the base current of a transistor with the collector output circuit operating an LED indicator or a relay to whatever alternative signal may be required. (Surface roughness limit for balls is 0.5 - 1.0 microinches.)



These designs aren't meant to be in any way definitive but as shown are quite practical, the method of use would be to set the adjustments and operate the contacts by the use of a caliper. The gauge would then be inserted slowly until bore contact was made, further insertion (involving a wall pressure of 5 gm maximum) would proceed until the signal indicated the target dia. had been reached. As drawn deflection from first touch to contact is 1 mm.

There'd still be the possibility that a distracted or insensitive measurer could press on after contact was established, if this be considered a problem both parts of the gauge could be sprung, as occurs in Type A.



A pertinent criticism of these and other gauges is that insertion usually involves traction contact with the bore, and particularly in the case of dust filled instruments continuous contact should be minimized. Vertical upward insertion would probably be ideal but the hazards of securing the instrument without any possibility of accidental or clamping damage are worth considering.

Type A would be somewhat fragile and fiddly to use, the setting grub screws must be in matched pairs and to cover the range from 6.5 - 15 mm. would required 4 sets. In no circumstance should screw heads protrude above the saddle piece, thus limiting the range of adjustment. The next range from 15 - 32mm. could be similar in principle but more robust.

Type B is extendable almost indefinitely with additional threaded fixed anvil pieces.

If thinking of constructing along these lines it's well worth using half balls, they're easy to grind in half using much patience and water, and will adhere to copper alloys quite well with epoxy, the surface finish as noted above is superb. Springs for Type A should preferably be beryllium copper but phosphor bronze would suffice. The balls for Type B are swaged in.

Regarding small diameter bores of brass instruments it might be worth while considering the medical endoscopic probes used to retrieve random hardware from body cavities. A flexible probe terminates with a pair of jaws operable with a Bowden type of cable. Something along these lines could be developed with a calibration of the operating trigger movement. If the casing were insulated sprung jaws similar to those suggested in Type A above could be extruded with the instrument wall making the switching contact. The limiting radius for the probe pathway could be quite small using fish-bead construction.

With regard to narrow bores Mitutoyo gauges go down to 3mm., no longer Tee shaped in the 3 - 10 range but just as adjustable and of similar surface finish to those of the larger capacity.

A final point concerning electrical contacts, they should be slightly domed and although brass would be suitable for a prototype pure silver is preferable for permanent use.

Woodwind Bore Measuring Tools

In Comm. 733 Jeremy makes reference to things which I said at a CIMCIM meeting in Oxford a few years ago. The upshot of that meeting was a text which I drafted for CIMCIM use which, however, they will not be publishing. (It will be packaged together with other material on various aspects of wind instrument measurement, and released by the Stockholm museum, hopefully before the year is out.) Jeremy received a copy of this text, and I wonder if it had at least a subliminal influence on Comm. 733. Relevant portions are "reprinted" below. (Although not discussed here, measuring the wall thickness of brass tubing is a fairly easy matter using industrial ultrasonic measuring probes. Given this information and the outside diameter of the tubing, it is quite easy to calculate the inside diameter. I'll be writing this up shortly for publication in the conservation literature; a summary should appear in the FQ an issue or two from now.)

1. General considerations.

The article assumes that the reader is familiar with the tools commonly used for measuring woodwind bores. A more detailed discussion of these devices will be given here. Although the specialist technician is likely to possess all requisite knowledge of this subject, there is at least one situation where the non-specialist will require a sound understanding of the matter, as well.

Museum curators are often put in a position where they must judge the suitability of a proposed measuring procedure in terms of the mechanical risk which it poses to an older instrument. The following material will be presented both from a general interest viewpoint, and as an aid to the curator who must decide whether to permit the use of a particular tool in connection with the examination of an object in his or her care.

Although it should be possible to construct a bore measuring device which would not require any physical contact between the measuring tool and the instrument, no such apparatus is currently available, and it is unlikely that anything of this type will be available in a museum situation in the foreseeable future. With the exception of x-radiographic techniques, which rarely provide the accuracy of detail required for most woodwind bore measurement applications, all tools used for this purpose require direct physical contact with the instrument being measured. For this reason it is not possible to measure the bore of a woodwind instrument without any risk of mechanical damage to its surface. If any such operation is to be undertaken, the risk can at best be minimized. This can be done in two ways, which ideally will be combined. First, the pressure exerted by the contact surface of the tool should be kept as low as possible, and the material of this surface should be as "soft" as possible. Second, the device should provide results of such high accuracy as to obviate any need for the arbitrary repetition of measurements by all workers examining any given instrument.

Since the accuracy of a bore measuring device depends on the firmness of its contact with the bore surface, it will be obvious that low measuring pressure and high accuracy cannot easily be combined. Indeed, any tool or procedure can provide no more than a compromise between these two factors. As may be seen below, simple devices which permit a high degree of tactile contact between the operator and musical instrument, may in skilled hands prove more satisfactory than might be the case with considerably more sophisticated apparatus. It also follows that the skill of the operator is as important a consideration as is the nature of the measuring tool being used.

2. Types of measuring devices.

The point at which a bore has a given diameter can be determined rather easily by inserting a suitably formed gauge of the sought diameter into the instrument and noting the point at which it firmly contacts the walls of the bore. A round disc attached to the end of a rod is the most obvious configuration for this type of device (1). If the rod is calibrated with a measuring scale it will be easy to see how far into the instrument the disc has been inserted when it comes into contact with the bore.

A disc will provide reliable measurements only when the cross-section of the bore is perfectly round. It will therefore be generally more useful to use an elongated gauge with its ends rounded to a smaller radius than that of the gauge itself. Commercial devices are available which are based on this principle, and are widely used by woodwind instrument makers. Two such gauges will be described below.

First, however, it will be useful to discuss an important situation where fixed measuring gauges cannot be used. Consider an instrument with a basically conical bore. Obviously, the gauge must be inserted from instrument's wider end. As long as the bore becomes continuously narrower from point to point along its length, no problems should be encountered.

If, however, there is any local expansion in the bore the gauge will lose contact with the bore surface in this "chamber". A similar problem is presented by an instrument with a slightly deformed cylindrical bore. Here again a fixed gauge will lose contact with the bore at many points and will not be able to provide measurements taken at any desired location.

Flexible gauges can be designed which can cope with highly irregular bore profiles. This type of device will generally incorporate some type of spring mechanism which keeps its measuring surfaces in constant contact with the bore. The measurement of a fixed gauge is determined before it enters the instrument. That of a flexible gauge varies as it is moved along the bore, and some mechanism for allowing this to be read outside the instrument is also necessary. An obvious disadvantage of this type of device is that its measuring surfaces will be dragged through the instrument in constant contact with the bore and will therefore leave continuous tracks. Even the gentlest spring pressure is adequate to leave a visible trace of the path taken by the tool. Commercial bore gauges, designed for measuring metal objects, may create a groove of measurable depth. This problem will be discussed in greater detail below.

Two important problems are shared by gauges with both types of measuring heads. Any device mounted on a straight rod will not be suitable for use with curved or warped instruments. If the curvature of an instrument were of constant radius, the rod could also be bent to this radius. However instruments do not warp to any such convenient shape, nor are cornetti, oboi da caccia, and other deliberately curved instruments built as segments of a circle. A useful means for surmounting this difficulty has yet to be suggested.

The second problem common to all measuring devices is that of the material of which their measuring surfaces are made. The surface of a bore is least likely to be damaged by a tool with a soft surface. In this case, however, the elasticity of the tool will prohibit exact measurements from being determined. A metal tool can easily be brought into firm contact with a bore and provides potentially reliable measurements. However, metal is much harder than are most bore surfaces and incautious use, or excessive measuring pressure can easily damage the bore surface. It is in fact quite possible for the accuracy of the measurement to be degraded by this type of tool actually deforming the instrument at the point of measurement.

Commercial measuring tools are usually made of metal because of the superior reliability of this material in most situations. Woodwind instrument makers often use such devices in their workshops and may see no reason to use anything else when measuring museum objects. It is possible for a skilled worker to measure such objects in a reasonably risk-free fashion using metal tools. The accuracy of the measurements taken in this manner would, however, not be reduced if the contact surfaces of the tools were covered with suitably formed pieces of plastic or wood. Safer still would be the use of carefully designed tools made entirely of plastic. Except for linear measuring scales and vernier calipers, such devices are not commercially available. It is however possible for the interested individual to make, or have made, plastic tools of the same basic design as those usually made of metal. Note, however, that it is quite easy to damage an instrument with a poorly made plastic tool. The use of plastic, in itself, provides no guarantee of safety. A simple precautionary measure is to use no commercial plastic tools without first smoothing their often rather sharp edges.

The genuinely concerned museum curator would be well advised to obtain a set of suitable plastic measuring tools and permit the use of no others when museum instruments are to be measured. The specialist curator may be able to judge when the use of

metal tools is necessary and/or permissible. In absence of the ability to make such a judgement, what may appear to be excessive caution is entirely justified.

3. Fixed-head measuring devices.

In the following discussion the term gauge will refer to the measuring head of the bore measuring device. The term shaft will refer to the rod to which the gauge is attached. Gauge length is the distance between the measuring surfaces of the gauge, and corresponds to a diameter of the bore. Shaft length refers to the distance between the position at which the gauge is placed inside the instrument, and the end of the bore from which the tool was inserted. Shaft length corresponds to the depth at which the bore has a given diameter. Shaft length and gauge length therefore correspond to the x and y axes on which bore measurements are commonly plotted.

Considering the restrictions in the use of disc gauges, the simplest gauge likely to be encountered in practice is the t-gauge (2). As suggested by its name this consists of a rod of a specified length which is mounted perpendicularly to its shaft. Since a bore is often described in 0.1 mm diameter increments, a large number of individual gauges will be needed to deal with woodwind instruments of various sizes. One shaft will therefore be used with several different gauges. The repeated changing of the gauges is quite tedious and t-gauges are therefore not very popular. In any case, t-gauges suitable for bore measurement are not commercially available, although they are not difficult to make.

A type of adjustable t-gauge can be made from two hollow tubes which are fitted together like two tubes of a telescope. The gauge length can be varied by adjusting the degree to which the inner tube projects from the outer tube. There are commercially available telescoping gauges which are built on this principle. The outer ends of the two tubes are sealed, thus forming the measuring surfaces. A spring is placed inside the tubes and pushes outward against their closed ends, thereby acting to extend the gauge to its maximum length. The shaft of the device is hollow and contains a threaded rod which is used to lock the two halves of the gauge at whatever length is desired. A set of four or five telescoping gauges is adequate to cover a range of bore diameters from about 5 mm to the largest diameters which are likely to be encountered. The shafts of the commercially available devices are much shorter than those needed for use with woodwind instruments. Suitable extensions are required, but can usually be devised with little difficulty.

Telescoping gauges are probably the most widely used of all bore measuring devices. They are inexpensive, highly transportable, and capable of providing highly accurate measurements. They can however be used in different ways, several of which may present a threat to the material safety of an older instrument (in addition to the general safety considerations discussed above). Normally, the gauge length of a telescoping gauge will be set using a micrometer or a vernier caliper prior to its being put into the instrument. The shaft length for the preset gauge length is then measured. After measuring, the gauge length can be rechecked with the micrometer. This technique is the safest and most accurate, although in some cases it may be inconvenient. It is also possible to lock the telescoping gauge at its shortest length and to insert it into the instrument to the desired shaft length. The gauge is then unlocked, whereupon the measuring surfaces are forced apart by the spring. This motion will be stopped when the ends of the gauge strike the wall of the bore. The gauge is then relocked, removed from the instrument, and the gauge length measured with a micrometer. The hammer effect of this technique is clearly undesirable. An unlocked gauge may also be slid along a bore thereby forcing the gauge to close, where it may be locked at the desired shaft length. The dangers of this technique are similar to those inherent in the use of flexible gauges. However, telescoping gauges are not designed to be used in this manner, and they may cause more severe damage than will a purpose-designed flexible gauge. Again, as a general museum rule only the safest of these three techniques should be permitted when dealing with sensitive material.

There is another type of adjustable fixed gauge which is suitable for measuring very small diameters. The "hole", or "ball" gauge consists of a small sphere attached to the end of a shaft. A hole is drilled through the length of the shaft and sphere. The

ball end of the device is split through the ball and a short distance into the shaft so that a wedge can be inserted into it, thus forcing the halves of the sphere to move away from each other. A threaded rod passing through the shaft is attached to this wedge. When the thread is tightened the wedge is pulled into the ball causing it expand. When the thread is loosened the wedge is forced out of the ball and the elasticity of the split shaft causes the two halves of the ball to come back towards each other. The ends of some ball gauges are ground flat to allow the device to be used for measuring the diameter of the end of a blind hole. Such tools are often called "end gauges". Ball gauges are preset and used in exactly the same manner as are telescoping gauges. A generally useful set of adjustable fixed gauges will therefore consist of both telescoping and ball gauges.

4. Flexible-head measuring devices.

There is one type of commercially available flexible gauge, referred to quite simply as a "bore gauge". Here a complicated system of springs and levers transfers motion between the measuring head, which otherwise resembles a telescoping gauge, and a dial indicator on the opposite end of the shaft. These devices are extremely accurate and convenient in use. However, they are designed for measuring metal objects and exert a measuring pressure which is far greater than that which safely can be tolerated on a delicate wooden object. For this reason such devices must never be used in any museum situation.

There would otherwise be a number of advantages in using this type of gauge, including the ability to measure every expansion and contraction of a bore. Consequently, several workers have spent a good deal of time trying to develop purpose-oriented alternatives. One of the more interesting of these is the "woodwind bore measurer" developed by Roderick Cameron (3). The v-shaped measuring head of this device consists of a flat piece of spring steel, one end of which is attached to a point a short distance from the end of the shaft. The free end of this spring is bent away from the end of the shaft, but can be pushed towards it with relatively gentle pressure. The measuring points are established by two small wooden knobs mounted on the outsides of the opposing ends of the shaft and spring.

As the gauge is drawn through the bore of an instrument the spring is forced towards the shaft causing the mechanical strain in the spring to change. This is monitored with a resistive wire strain gauge (4). The gauge length is thereby transformed into an electrical quantity which can easily be transferred to the outside of the instrument for processing and recording.

Cameron's means for doing this are quite ingenious. The end of the measuring device on the outside of the instrument is attached to the paper in a strip chart recorder (5). As the measuring head moves through the instrument the paper is pulled past the pen. The signal from the strain gauge is fed to the amplifier controlling the pen's motion. Since the motion of the pen is proportional to the gauge length of the measuring head, a strip chart with the profile of the bore can easily be drawn.

There is a problem with the non-linearity and drift of the calibration of this device in its present stage of development. Also, measuring heads of several sizes share the same electronics causing some further difficulty. As a consequence of this, conventional measuring techniques must be used to verify and rectify the data which it produces. There is also the disadvantage of the constant contact between the measuring head and the instrument. Although the measuring pressure may appear to be acceptably low, it is applied to the bore on very small measuring surfaces and cannot a priori be accepted as harmless. Despite its extreme promise, this type of device must be used with due care both to its mechanical effect on delicate instruments, and to the lack of accuracy in what otherwise give the appearance of being very reliable metric records of a bore.

5. Additional comments.

Other types of devices have been developed which allow a gauge to be adjusted and read from the outside of an instrument without the measuring head being in constant

contact with the bore. These may take the form of specialized calipers, or other more or less complex mechanical contrivances. As yet no such device has come into common use, and there is none which can be particularly recommended for museum use. It is unlikely that any breakthrough will occur until contact free techniques have been developed to the point where they are easily accessible in this situation. It would seem reasonable to expect that current electronic and opto-electronic technologies will someday permit this to happen. Until such time as a reliable contact free device is available, however, there is much to recommend the continued use of conventional fixed-head measuring gauges.

6. Notes and references.

1. A set of flute measuring discs is illustrated in the Dayton Miller translation of:
T. Boehm, "The Flute and Flute-Playing", reprint ed.,
Dover Publications, New York, 1964, p. 51.
2. A useful review of the literature concerning woodwind bore measuring tools is given in:
J. Burton, "Bassoon Bore Dimensions", (diss.), University
Microfilms, Ann Arbor, 1975.
3. B. Frh. v. Tucher, "Darstellungen von Bohrungen und
Oberflächen mit Hilfe von Roderick Cameron's "Woodwind-
Bore-Measurer", Arbeitsblätter für Restauratoren,
15(1982), Group 13, 3-7.
4. The electrical resistance of a wire can be changed by
subjecting it to mechanical strain. A resistive wire
strain gauge consists of a length of very fine wire
through which a current is passed. When a surface to
which the gauge is glued is subjected to a change in
mechanical strain, the strain in the gauge will also
change. The subsequent change in the current passing
through it is registered with suitable electronics.
5. A strip chart recorder is used for recording events which
are capable of representation in terms of a changing
voltage. A pen moves across the width of the recorder in
a manner analogous to the action of the needle in a
conventional volt meter. A continuous strip of paper is
fed past the pen by the action of a motor. In the
Cameron device the paper feed mechanism is disengaged.

* * *

In the time that has elapsed since this text was written, I have been told of a super-snazzy microcomputerized set-up which claims to solve the problems listed above. There is obviously a lot which can be done before reaching the contact-free "utopia" mentioned above. With the currently available tools, however, I strongly suspect that by far the greatest damage done to museum objects has been a result of unskilled operation, rather than anything inherently dangerous about the tools, themselves. Indeed, what does a museum curator do, lacking any knowledge about the suitability of a measuring procedure (tool + operator), when confronted by a confident and insistent visitor who has travelled thousands of miles specifically to measure instruments? Lose friends, or lose instruments?

FOMRHI Comm 763

Amsterdam, September 19, 1986

Mr. J. Montagu
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Dear Jeremy,

In the last Quarterly you invited us to join a discussion on measuring antique musical instruments. As the subject seems to be a matter of religion, rather than anything else, I feel free to add a few statements to the discussion. Because my main interests are recorders, it is a limited view.

1. Antique recorders are not only surviving pieces of turnery, but also surviving musical instruments. Thus musical characteristics have to be recorded (sorry), i.e. sound, sound quality and the acoustical measurements. Only preserving them for the future seems a contradiction: no one will hear them any more.
2. All measurements are dangerous and measuring instruments should therefore be limited to the bare minimum, preferable only once.
3. Measurements and drawings of instruments in public collections are public and they should be made available at cost, and not be used as a profit making item. Museums should make this as a condition for letting someone taking the measurements.
4. Good quality professional tools are nearly always superior to anything home made, but, as any tool, they should be used properly. E.g. a calipers is not the correct tool for measuring the window of a recorder head.
5. Nearly all tools are made of metal: you don't want to measure the deformation of the tool! To spoil a good digital calipers with an accuracy of 0.01mm, or better, by adding a flexible, (parallel?) and compressible set of plastic pliers is nearly as bad as spoiling a good recorder.
6. Measurements should be stated with a probable error, otherwise they are meaningless. I compared 3 sets of bore measurements of the bore of the centre piece of the Terton recorder, which I measured (I got 2 sets after I did my own measurements!). The average error between them was $0.08\text{mm} \pm 0.04$ (1 σ), with a maximum error of 0.25mm. I think this to be a reasonable accuracy, considering the material being measured. Normally, the accuracy is implied by stating the number of digits in the measurements to the last significant figure. A too high quoted accuracy indicates a fundamental misunderstanding of measuring techniques. The Bate 0114 drawing may be an example of this. In general, measurements should be done several times, and averaged, which would reveal the accuracy.
7. Measurement tools need to be dimensionally stable: nobody wants to calibrate his device every time he takes a measurement (and only few do!). Ivory is not stable (I have some cracked bare ivory pieces), and, at least in Holland, ivory billiard balls are an antique item. They are made of plastic since 1960.
8. Measuring bores is relatively straight forward, but measuring head dimensions is much more complicated. No tools exist and most damage is probably done in this region (nicks in labium, cracked heads due to unwilling

- blocks?). I would very much appreciate more information on this topic.
9. There is no need to censor any article on measuring techniques (including mine). It is better to publish the method, and give your comments, if you feel this to be necessary. Other people may just continue the way, you don't want them to go.

Only to satisfy my curiosity and referring back to that Comm 638, I would expect to see regular increments in depth and irregular increments in diameter, when measuring with expanding gauges, e.g.

0, 19.2,
10, 18.85,
20, 18.8, etc.

Doing it the other way, i.e. pre-setting the diameter of the gauge, I would expect to see at least irregular depth increments and maybe regular diameter differences, such as

0, 19.2,
3, 19.1,
7, 19.0,
8, 18.9,
20, 18.8, etc.

If this is true, then 'most measurements of F. Morgan are done with expanding gauges', and even the head joint of Bate 0114 (Ken Williams) seems to have been measured with expanding gauges. Please tell me how he did it, because, surely, I must be wrong somewhere.

This paragraph now is added later, one of the advantages of using a computer for letters and so on. I just got copies of the Q's I did not have yet (1-22), via the set available at the Huismuziek. I started reading them, and much, if not all, of what I meant to tell you, has been said already, and much better than I can, in particular in Q9 with the Comm's from Cary Karp and Trevor Robinson (83 and 86), not to forget the remarks from Bob Marvin in the same Q, but there were many others. Well, keep my remarks for the record. Forthcoming December, the Bouwerskontakt, together with the Haags Gemeentemuseum, has organised a two-day session on measuring instruments. The museum has now some newly developed apparatus and these will be introduced. Rainer Weber will be one of the speakers, and it promises to be an interesting event. I will keep you informed on this.

Another thing is the computer and modem connection issue which cropped up several times now in the Quarterly. I believe Gary Karp is right if he assumes that, in future, communications may be quite different from now, and that it may be worthwhile to keep an eye on the developments. On the other hand, the real situation is far from ideal and nearly all communications I deal with have problems of interfacing, bad lines, incompatible protocols, dropped lines, character conversion problems, etc. In short, unless a lot of preparation work is done, they never seem to work. The cost calculation of Cary is therefore somewhat optimistic, as it assumes a perfect line, with no trials and no investments.

Most larger computer systems will not have an open modem connection available, as this is a potential security risk. It is however also true to say that public, reliable data networks do exist, maintained by national ptt's, and that already several public mailing services are set up and working, such as the EARN (European Academic Research Network), Bitnet and EUNET (for Unix users). These would be easy to use, but they are by no means cheap. Using the X.25 Dutch datanet service, it would have costed more than 6.5 Dutch guilders to mail this letter (roughly 8400 characters) to England,

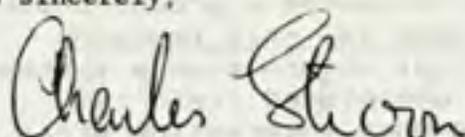
in fact to anywhere in Europe (0.5 cent per package of 64 characters). And this includes the direct transfer cost only, not the overhead costs at all! Although I would be interested to hear of anybody having access to any of these networks, I also believe that the subject is not yet ripe for Fomri at the moment.

I tried to figure out whether Cary Karp would have such connection, but I don't think he has one. I could of course write to him, but since Q43 I don't know his address any more: Staten Musiksamlings (p.11) or Musikmuseet (p.51)?

A totally different subject are sharpening stones. I used to have difficulties to get a real sharp edge on critical tools, such as labium knives and skew chisels. I tried all the stones which I could get hold off in Holland, (natural Arkansas, Belgian stones, artificial ones), but it remained difficult and an oily mess. I recently bought in Canada a set of Japanese water stones, and these work extremely fast and good: it is possible to get a polished edge within minutes! Maybe this is old news for everybody outside Holland, but I thought I better let you know; I have never seen them in Holland. I include a copy of a few pages of the catalogue of the company where I bought mine. The 240 page catalogue itself is worth reading and costs CDN \$ 4.00. Actually, I bought the 800x and 4000x grade in Canada, and used a mail order for another 200x stone, not available when I was there. The last method was rather expensive after post and customs got their share.

Last but not least, the Quarterly remains a pleasure and joy. Let it live very long.

Yours sincerely,



Charles Stroom
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1077EB Amsterdam
Holland

P.s. Is the treatment of Marc Champollion not a trifle too hard? After all, the only thing he did, I believe, was using odd sized manuscripts and ventilating some funny thoughts about letter esthetics. His contributions could have been reduced and put two on one A5 page, in 2 columns (or get 'Sverred'?).

JM adds: The pages from the tool catalogue are interesting but not reproducible. The firm is Lee Valley Tools Ltd with branches in Ottawa, Toronto and Vancouver. Head office is 2680 Queensview Drive, Ottawa, Ontario K2B 8H6, Canada; tel: (613) 596-0350. They take payments by Master Card (called Access in UK) and Visa, which saves any problems of dealing in foreign currency.

FoMRHI Comm. 764

Bruce Haynes

A preliminary checklist of iconography for oboe-type instruments, reeds, and players, c1630-c1830

Early works of art are an open window into the past, in all its detail. The sounds of the music may be gone, but every visual aspect of making it can be seen. Iconography, with early texts and surviving instruments, constitutes a major source of information on playing early instruments. In the case of the oboe, it reveals a sequence of instruments (including early and transition types), reeds, embouchures, bodily attitudes when playing, orchestras and oboe bands at work, and portraits of players. Whereas surviving oboes are rarely dated and makers' stamps give us at best very unspecific dates, art works are more easily datable and thus help us to "triangulate" on many aspects of the instrument's history.

As is evident from reading A.P. de Mirimonde's ground-breaking work, L'Iconographie musicale sous les rois Bourbons (Paris: 1975), the amount of potential information a systematic study in this vast and as yet unexplored field can yield is very promising. One of the most interesting areas of study would be the chronological development of the physical aspects of the oboe during the period 1660-1810, as seen in the plastic arts. Eventually, such a study could be collated to surviving instruments and could lead to a "key" (similar to those used in taxonomy) for dating and placing oboes.

For various reasons, iconographic documentation is not easy to collect. The first step, of course, is to locate as many artistic depictions of the oboe as possible. To this end, I have prepared the following list, and would like to request the help of fellow members of FoMRHI in locating other works and refining the information in these. Of the 202 works listed here, I reckon only 83 are truly readable, excellent and trustworthy (unfortunately, this must be a subjective judgment), and of these, 62 show instruments. Information includes titles, media, date, location, description, and accessible reproductions.

- Hertman, Nicolas (1713-93)
Musiceerend gezelschap Aquatinta n.d.
Location: Amsterdam: Rijksprentenkabinet
Shows 2 sitting, playing oboists
Reproduced in: Salmen 1969, fig. 36; Balfoort y
- Anon 001
Frontispiece to A Pocket companion for gentlemen and ladies Book [? engraving] c1725
Chamber group includes playing oboist. Depiction not bad.
Reproduced in: Dufourq 1965 y
- Anon 002
[Playing oboist] Oil painting
Location: Home of Willi Burger, Zürich (bassoonist)
? French. Playing oboist; similar to Verbeeck. Shows reed. y
- Anon 003
A caricature of London's Sunday concerts Etching
Late 18 C
Location: [? London]: Mansell Collection
"Satire on London virtuosos of the late 18th C."
Resembles Hogarth. Shows two playing oboists, one (behind Hps) claimed to be Fischer
Reproduced in: Kinsky 229/4; Hogwood 1980, ill. 61
- Anon 004
Oil painting ? 17th C
Location: Mauritshuis, The Hague
Reclining, playing oboist y
- Anon 005
Front plate for The Compleat tutor for the hautboy, W77
Book [? etching] c1746 Pub. London: Simpson.
Location: see Warner
Reproduced in: Evans 54 y
- Anon 006
Front plate for The Compleat tutor for the hautboy, W126
Book [? etching] c1775 London: Bremner
Location: see Warner
Drawing of oboist opposite title p
- Anon 007
Ein Collegium Musicum in Deutschland c1775
Location: Nuremberg: Germ. Museum
Page from a family album. Performance of a cantata, with three standing playing oboists. Difficult to see details
Reproduced in: Lesure MGB 1966, 43 y

- Anon 008
Performance of a Turkish opera Watercolor c1775
Location: Munich: Theatermuseum (11 A73 A)
Said to be Haydn at keyboard at Esterhazy theater.
Three oboes are at far R of orchestra, one facing out, two facing in. Difficult to make out details.
y
- Anon 009
? Etching
Location: The Hague: Gemeentemuseum
Stylized dancing player. Very loose embouchure; could not actually be playing
- Anon 010
Procession of the Shriners of Nürnberg 1731
Location: Nuremberg: GNM
Two bands with oboists
Reproduced in: Salmen, ed. Der Sozialstatus..., p.48 y
- Anon 011
Tafelmusik des Fürsten Krafft Ernst zu Dettingen
Silhouette on a gilt background c1791
Location: Mairhingen: Fürstlich-Dettingen-Wallersteinschen Bibliothek
Shows two oboists in a wind ensemble. Rosetti was a composer here
Reproduced in: Salmen, ed. Sozialstatus... (also Eng. tr.), Tibia calendar y
- Anon 012
Glass goblet ("Pokal") 1st 1/4 18th C
Location: Zürich: Kunstgewerbemuseum, glass collection
Inv. Nr. 8403
Oboist and flutist, reclining. Reed not clear, but looks odd
Reproduced in: Photo in Sammlungskatalog 4 ("Glas") (J. has)
- Anon 013
[Players in the Royal Military Academy] Ceiling painting 1704
Location: Copenhagen: Danish Royal Military Academy
Shows an oboist and bassoonist, among others. Portrait of French oboist who introduced the Ob to Denmark (name known to Michel Piquet)
- Anon 014
Grossen Aufzug zu Fuss und zu Pferde (? Etchings) 1709
Location: Dresden: Staatl. Kunstsammlung
Oboe and shawm players
Two plates reproduced in Hildebrand II:9 (Tibia 1/78)

- Anon 015
Copperplate (etching)
Location: Dresden: Kupferstichkabinett, Sax., Top., ca.
192/bl. 32
3 oboists and bassoonist
Reproduced in: Hildebrand I:60 (diss.) y
- Anon 016
4 Hautboisten (? Kupferstich/engraving)
Location: Dresden: Kupferstichkabinett, Sax., Top., S.
195/196
Reproduced in: Hildebrand I:48 (diss.) y
- Anon 017
Earthenware saucer c1790
Location: ?
Portuguese. Seated oboist, playing. Hardly realistic
y
- Anon 018
State funeral of His Grace John late Duke of
Marlborough Engraving 9 Aug. 1722
Location: Banks Coll. (YB-27)
At no. 15 in the procession appear after "Major Tatton
alone...six hautboys". Publ. Henry Overton
- Anon 019
Details from the procession of the Lord Mayor of
London, 29th October 1742 Line engravings 29
Oct 1742
Location: Banks Coll. (Ms 2-97)
From the border of a child's 'writing sampler'. Shows
playing oboists and bassoonists
Reproduced in: Croft-Murray 152 y
- Anon 020
Mounted band in the procession accompanying the State
Entry of the Venetian ambassadors Querini and
Morosini into London Line engraving 18 April,
1763
Location: Banks Coll. (Ms 2-80)
Shows several mounted, playing musicians, including Obs
and Bens
Reproduced in: Croft-Murray Pl. 111 y
- Anon 021
The band of a regiment of guards entering the Colour
Court, St James's Palace Line engraving
c1790
Location: Grace Coll. Pf. XI, Sh. 11, No. 11
Shows playing oboists. Possibly the band of the
Coldstream Guards. See Parke II:239-42.
Reproduced in: EM July 81, Croft-Murray Pl. 113 y

- Anon 023
The Dresden Kapelle accompanying an open-air serenata
by the Kapellmeister J.C. Schmidt Pen and ink
drawing Sep 1719
Location: Kupferstichkabinett, Dresden
Orch. very small in middle, perhaps possible to see if
large enough
Reproduced in: EM May 1985, 179 y
- Anon 024
Halle im Herrenhaus Damp, Schlesswig-Holstein.
Neugestaltung mit galerie und orgel Stucco
ceiling c1721
Location: See title
Figure of angel playing oboe
Reproduced in: Salmen 1969, fig. 57; Foto Landesamt für
Denkmalpflege Schleswig-Holstein y
- Anon 025
Portrait of Matteo Bissoli Engraving (2nd 1/2
18th C)
Location: Pinacoteca, Brescia
Apparently a good quality engraving
- Anon 026
Untitled Oil painting
Location: ? Bengt Nässén, Stockholm
? French. Musical group: singing woman in center,
traverso (old French style) player to L, a (?)
player to R. Poss. Db (bottom) or Rec (top).
Fingering [?] 23 56 [? + extra hole]. Blown to
side like recorder. Photo sent by B., who may have
bought it
- Anon 027
[Garland of instruments] Woodcarving on organ name-
board 17th C
Location: Flentrop Workshop, Santpoort Zuid, Holland
? Original. Depicts Db and reed. See note in GSJ
1984:117
Reproduced in: Post GSJ 1984 y
- Anon 028
Title page to Le Retour de Grétry dans sa patrie by
Saint Péravi [Etching] Liège: 1783
Location: DHqm; probably also elsewhere
Reproduced in: Post GSJ 1984 y

- Anon 029
Carving of double-reed quartet on bell of Ob att.
Beuker Wood carving 17th C
Location: London: Victoria and Albert Museum
Shows quartet playing from part-books around a table.
Discussed in Halfpenny "17th C oboe quartet", GSJ.
Reeds difficult to see, although crook on F-Ob is clear. W. Beuker dates c1669-1750.
Reproduced in: Halfpenny GSJ, Joppig 74 y
- Anon 030
Portrait of oboist [? François LeRiche] Oil painting
c1710
Location: Berlin: Staatliches Institut für
Musikforschung (instrument collection)
Excellent formal portrait. Reed shown clearly. An on-
site examination shows careful attention to reed
shape in brush-strokes (possibly corrected later).
Reproduced in: Haynes 1976 and "Concerti per oboe,
archi e cembalo" (Haynes) RCA recording RL 30371;
Joppig 73 y
- Anon 031
Title page to The compleat flute-master, W 18
[Engraving] c1695
Location: see Warner
Reproduced in: Harry Vas Dias's art. Tibia; Welch
Lectures on the recorder y
- Anon 032
Early 18th C French drawing of woodwinds [? Pencil
drawing] c1705
Location: Collection of Edward Croft-Murray
Shows Rec, Trv (French 3-piece), Ob with reed, Bsn with
reed, Bass Rec
Reproduced in: GSJ XXXIII p130 and plate XII y
- Anon 033
Portrait of Sante Aguilar Oil painting Probably
1767
Location: Bologna: Sala Bossi, Liceo Musicale
(Conservatory)
Illegible stamp on Ob. See art. by C. Schneider in
Tibia
Reproduced in: Tibia 3/80; A. Bernardini, "Oboe playing
in Italy" (title) y
- Anon 034
Title page to John Milton's Paradise Lost
[Engraving] Verona: 1742
Reproduced in: Tibia 2/80, p 108 y
- Anon 035
Title page to N. Derodier's La fuite du roi
d'Angleterre [Engraving] Amsterdam: 1689
Location: (See RISM)
Reed not clear
Reproduced in: D.F. Scheurleer, [?] Het muziekleven van
A'dam, in de 17de eeuw. The Hague: 1911 y
- Anon 036
Portrait of a musician (French) Painting c1630
Location: Vienna: Kunsthistorisches Museum (Inv.Nr.GG
481); hangs in room 11 of inst coll.
Corner shows carefully painted tenor curtal with quite
visible reed. Excellent source. y
- Anon 037
Family Parguez [? Oil painting]
Location: Pontarlier, France: "Museum"
Shows oboist holding inst so that top and reed can be
seen, although not clearly y
- Anon 038
"Der durch das herrlichangelegte Paradis-Gärtlein etc."
[? Engravings] Nürnberg: 1724
Location: ?
- Anon 039
Frontispiece to D. Purcell's The Psales set full for
the organ or harpsichord [Engraving] London:
Walsh, 1718
Location: GB-Lbl
Upper corners show oboes with reeds (fairly good
depictions)
Reproduced in: Smith 1968, plate 25 y
- Anon 040
Illustration in Select preludes and volientarys for the
violin.. [Engraving] London: Walsh, 1705
Location: GB-En
Shows two short, wedge-shaped reeds
Reproduced in: Smith 1968, plate 14 y
- Anon 041 [after Mignard]
Sainte Cécile jouant de la harpe Oil painting
Beg. 18th C
Location: Paris: Louvre, Cabinet des dessins, Inv. 3;
cat. Guiffrey-Marcil X, 10284, inv.3 1337
Copy of Mignard painting; shows Ob and reed in lower LH
corner
Reproduced in: Miriamonde 1974, planche 141 y

- Anon 042
Panneau d'instruments de musique Boiserie sculptée
Beg. 18th C
Location: Versailles
Includes Ob with reed. Ob rather inaccurate
Reproduced in: Dufourq La Musique, p. 304
- Anon 043
[Scène d'Opéra] Pencil drawing 1767
Location: Paris: Bibl. de l'Opéra (Collection Hennin)
Shows musicians
- Anon 044
Fetes données par la ville de Paris à l'occasion du
premier mariage de Mgr le Dauphin Engraving
23-26 Feb 1745
Location: Louvre, Cabinet Rothschild
Orchestre de la salle du bal de la Cour de l'Hôtel de
Ville. Includes six playing oboists.
Reproduced in: Mirimonde 1975:II, fig. 59 y
- Anon 045
Le Trio [école Liégeoise] Painting c1760 [given
as c1830]
Location: ?
Gallant trio: violinist, lady [? singer], playing
oboist. y
- Anon 046
Le Morceau d'ensemble ou le désespoir du compositeur,
(dédié à tous les musiciens) Lithograph
c1820
Location: F-Pn
Parody of Hogarth's "Enraged musician" (1741). Shows
playing oboist; not very accurate y
- Anon 047
Hofausikanten Emblem (Tischzeichen) on wood ?
c1815
Location: Salzburg: Residenz-Verlages (from book
"Volksmusik" by Leopold Schmidt)
From Neuburg in Styria. Joke picture showing angry
music director assualting six players. Shows
playing oboist; not accurate
Reproduced in: Bär calendar 1977 y
- Anon 048
Concert Italien Etching ? c1730
Location: Present whereabouts unknown
Shows Pietro Locatelli, (Domenico) Scarlatti, Tartini,
Lanzetti, and Giuseppe Sammartini playing together
with a cat [sic]. Difficult to see whether
Sammartini is playing Ob or Rec
Reproduced in: Dunning, Albert. P.A. Locatelli. Buren:
1981, p.9 y
- Anon 049
"Nobleman with flute" [sic] Oil painting [?
c1720]
Location: Possibly two copies: one in Stone Mountain,
Georgia; [? also New Zealand]
Man in renaissance costume [sic] with well-painted Ob
with reed (? c1720). Ascr. Jean Antoine Laurent
(1763-1832), but not possible considering
inst. "Bought at a yard sale for 25 cents." y
- Anon 050
Le retour des aeronauts Blanchard et Lepinard à Lille,
le 26 mars 1785 Oil 1785
Location: Musée des Beaux-Arts, Lille (Inv. 1864)
Mounted oboist and bassoonist in center of painting.
Ascr. Watteau, who died in 1721 [?] y
- Artaria [Ed.]
Drawing with Ob fingering chart [? Engraving]
c1785
Innaccurate drawing of inst and reed
Reproduced in: Joppig y
- Aveline, [Pierre, 1654-1722]
Le tems de la Soirée [after Mondon le fils] Etching
c1691
Location: F-Pn (Estampes, Kd.3, M 31384)
Middle extreme L shows player; possibly an oboe or
chanter from a musette
Reproduced in: Mirimonde 1975:I fig. 30 y
- Blanchet, [Thomas, 1614-89]
Engraving By 1672 Opposite title page in
Borjon's Traité de la musette (N. Aureux tec.).
Later edition Paris: 1678. Ob player together with
other Ob-type insts y
- Bonani, Filippo
"Oboè" in Gabinetto armonico 1722
Page 67, fig. xxiii. Reprinted by Dover as Antique
musical instruments and their players (New York,
1964). Innaccurate, highly simplified Ob makes
source unreliable.
Reproduced in: Dover

- Bonnart, N. (1636-1718) 001
 "Le Sanguin" [after R. Bonnart 1652-after 1721]
 Etching By 1718
 Location: F-Pn (Estampes)
 Dancers accompanied by an oboist, carefully drawn. All
 known Bonnarts were born in 17th C.
 Reproduced in: Mirimonde 1975:1, fig. 35 y
- Bonnart, N. (1636-1718) 002
 "Berger de Gonesse" Engraving [? c1775]
 Location: ?
- Boode, C.G.
 "Hoboist der Hollandse Garde 1760 - In garnizoen te Den
 Haag" Painting 1760
 Location: Leiden: Legermuseum
 Bad depiction of inst and reed
 Reproduced in: Postcard printed by Legermuseum (no. 4)
 y
- Brod, H.
 Illustrations in Méthode pour le hautbois Etchings
 1826
 Location: see Warner
 Pp 3,4 show player. Also depictions of reed tools and
 reeds for C-oboe and Baryton
 Reproduced in: Reeds and tools in Haynes 1984 y
- Calendriers
 Possible musical depictions: check each year
 Location: F-Pn
- Carmontelle, [Louis Carrogis (1717-1806)]
 Quatuor: Prover, Duport, Vachon et Rodolphe Painting
 ?1780
 Location: Chantilly: Musée Condé
 Philippe Prover (1727-74), oboist in the service of the
 King and later the Prince de Conty [sic], came
 from a Turinese family of oboists, and had a high
 reputation
 Reproduced in: Shown at Comtesse's exhibit y
- Chardin, Jean-Baptiste Siméon (1699-1779)
 Les attributs de la musique militaire Oil oval
 1767
 Location: Private collection [? France: ch. de
 Bellevue]
 One of two ovals designed for mounting above the door
 of the music room at the château de Bellevue.
 Shows only bell of oboe in mid-L.
 Reproduced in: Mirimonde 1975:11, fig. 8 y
- Cipper, Giacomo Francesco [18th C]
 Duo of musicians Painting [18th C]
 Location: Munich: Galerie Wein-Müller
 Shows singer and oboist, with inst and reed clearly
 visible. y
- Cochin, Charles Nicolas II (1715-90)
 "Asie" Etching [? c1760]
 Location: Berlin: "Cabinet des Dessins et des estampes"
 Boat-load of musicians, fairly accurate; oboist playing
 with cheeks puffed out
 Reproduced in: Mirimonde 1975:1, fig. 44 y
- Colyer (Collier), Edwaert (?1640-1707)
 Vanitas Oil on linen 1691
 Castres: Musée Goya
 Fine painting showing various instruments including a
 recorder and the bottom of an Ob with ivory mount
 and nails. Another Vanitas by C. dated 1684 shows
 the earlier style recorder, perhaps indicating
 when French ww arrived in Holland
 Reproduced in: Tibia 1984 calendar
- Corvinus, Johann
 Orchesterkonzert im Münchener Kongregationssaal [after
 Matthias Diesel] Copper engraving c1715
 Location: Munich: Stadtmuseum (Inv.-Nr. 2 699)
 Depicts the Jesuitengymnasium of the present Munich
 Bürgersaal. Playing oboists, but no clear details
 Reproduced in: Schwab fig. 22 y
- Cotton, William
 Trade card [? Engraving]
 Location: ?
 Ob reed, although not clear
- Danchet, Antoine 001
 Le festin Royal Engraving [after drawings by Pierre
 Dulin (1669-1748)] 25 Oct 1722
 Location: Houghton Library, Harvard; F-Pn; Louvre (in a
 folder of 57 drawings by Dulin made at the
 coronation)
 From a series on the coronation of Louis XV; this is a
 "Tafelmusik" at the City Hall at Reims. Shows
 playing oboists and reeds. Obs look like Lot and
 Bizet. One player on R side appears to be playing
 clarinet. Obs also in trophées in border
 Reproduced in: Naylor, Plate 93-94; Tibia calendar
 (attr. Tardieu); Flrt Pl XIX (attr. Charles [sic]
 Dulin); F-Pn Foto Droit No. 7768 y

- Danchet, Antoine 002
 "The King going to church" Engraving 25 Oct 1722
 Location: Houghton Library, Harvard; Louvre
 From a series on the coronation of Louis XV
 Reproduced in: Naylor, Plate 167; Tibia calendar y
- Darby, Matthew (fl.1754-78)
 Royal Music, or wind harmony Etching, colored by
 hand 1777
 Location: Coll. Anthony Baines
 Mild caricature. Playing musicians, including 2 Obs
 Reproduced in: Croft-Murray Pl 112 y
- Delcloche, Paul Joseph (1716-55)
 Hofkonzert beim Fürstbischof von Lüttich auf Schloss
 Seraing Oil on linen 1753
 Location: Munich: Bay. Nationalmuseum (inv. Nr. R 7158)
 Clear playing oboist on far left side. D. was Belgian
 (? Liégeois)
 Reproduced in: Marburg, Bildarchiv Foto Marburg,
 Archiv-Nr. 110742; Schwab fig. 7 y
- Devéria
 Devéria collection Drawings 17th C
 Location: F-Pn (Estampes) M 31232-31271
 Wind insts dating from 1636; mostly just previous to
 baroque. An Ob without keys (called "flageolet")
 and a recorder very similar to Fr.-Poncein ill.
- Diderot, D. [ed.]
 Plates VI, VIII, IX, X in "Lutherie" section of the
 Diderot Encyclopédie Engravings 1753 and after
 Good illustrations of various woodwinds, reeds, and
 tools for manufacture. Plates vary in quality
 depending on edition
 Reproduced in: Good Ob in Harry Vas Dias's Tibia art. p
 107; all plates in Joppig 56, 58, 59 y
- Dominiquin [after]
 Title page used for Handel's Alexander, Rodelinda,
Ismeriane [Engraving] 1726
 Location: F-Pn (Res. V.S. 125-27; cliché order nr. B0 C
 100261)
 Published by J. Cluer. Lower LH corner shows oboe and
 reed; looks copied from Mignard's Ste. Cécile.
 Reproduced in: Decorative music title pages #153 y
- Eisel, Johann Philipp
Musicus autodidactus, W 71 Engraving 1738
 Location: A-Wgm; D-Mbs; GB-Lbl; US-Wc
 Fingering chart between pp 98-99 shows oboe with reed,
 fairly clear, obviously stapled
 Reproduced in: Haynes 1978 y

- Engelbrecht, Martin (1684-1756) 001
 Flöten, Hautbois, Flachinett [sic], Fagot [sic] und
 Clarinett Engraving c1720-30
 Location: ?
 Possibly based on design by S.C. Majer. Shows recorder
 player with other insts on table. Includes poem.
 Oboe not very accurate; reed invisible. y
- Engelbrecht, Martin (1684-1756) 002
 "Faiseur de flutte", "faiseuse de flutte" from
Assemblage nouveau des manouvriers habiles
 Engravings 1730-40
 Location: Binningen; Ernst W. Buser private collection
 Nrs. 169 and 170. Designed by "C.P.S.C. Maj." [Majer].
 Both figures are "clothed" in tools and
 instruments of their trade; the "faiseur" has an
 oboe.
 Reproduced in: Joppig 80-81 y
- Fischer, J.C.
 Illustrations in The compleat tutor, W 119; New and
complete instructions, W 142; and W 169
 Engravings c1770, c1780, c1790
 Location: see Warner
 Simple ill. of Ob and reed with fingering charts, pp 2,
 3-5. Similar in all editions; probably also W 141.
 y
- Freillon-Poncein, Jean-Pierre [author]
 Fingering charts in La Véritable Manière, W 35
 Paris: 1700
 Location: F-Pc; Fn; US-Wc
 Shows caricature of an Ob, but turning details are
 clear
 Reproduced in: Mf facs.; First cover y
- Fritsch, Christian
 Konzert beim Jubelmahl der Hamburger Bürgerkapitane
 Copper engraving 1719
 Location: Hamburg: Staatsarchiv
 Shows playing oboists but no details are clear
 Reproduced in: Schwab, figs. 25, 26 y
- Froehlich, J.
 Plates in Vollständige Theoretisch-practische
Musikschule Etchings [1810-11]
 Location: F-Pc; US-Wc
 Pp 54-55 show Bsn reeds and reed-making tools y

Gainsborough, Thomas (1727-88)
 Portrait of Fischer Oil painting Between 1774-88
 Location: Buckingham Palace
 Shows Fischer, pen poised, leaning on the top of a Hps,
 with an Ob and Vn [? Va]. Ob has square keys,
 therefore probably German rather than English
 (Crone, later Sattler, early Grenser ?)
 Reproduced in: Queen's Gallery poster, MGG, GrVI, Tibia
 calendar, Joppig 121 y

Gamelin, Jacques (1738-1803)
 Musiciens ambulants
 Location: In Baltimore show, April 1946. Jacques
 Seligman & Co., NY.
 Ob, among other insts

Garnier, F.J. (1755-c1825) [author]
 Modèle du Roseau et des Outils nécessaires à la facture
 de l'anche dans leurs proportions exactes
 [Etching] c1798-1800
 Location: D-KNh; F-Pc; I-Fc; NL-At; Uim; CS-Bu
 On page 7 of Garnier's Méthode raisonnée pour le
hautbois, W 233. Accurate drawings of tools and
 oboe reed in various stages, including finished.
 Also depicted is a scale drawing of an Ob by
 Delusse
 Reproduced in: Warner 1962; Haynes 1984 y

Garsault, F.A.P. de [ed.]
 Reed illustrations in his Notionnaire Engraving
 1761
 Location: see Warner
 Page 627 shows Ob and Bsn reeds; p 634 shows reed
 inserted in Ob (the two Ob reeds are not alike)
 Reproduced in: Haynes 1984 y

Gatti
 Paisiello conducting a rehearsal of Rossini's Barber of
 Seville in the presence of Catherine the Gr.
 ? c1800
 Location: ?
 No Gatti with appropriate dates listed in Thieme and
 Becker.
 Reproduced in: Early Music 1/2 (April 1973) y

Ghezzi, Pier Leone (1674-1755)
 Caricature of the Plà brothers
 Location: ? Not in Paris; Louvre, or London: BM
 Caricatures by G. are in Vienna (Albertina) and
 Florence (Uffizi). I have checked Paris and London
 already

Gobelins 001
 "Arazzo Gobelins": Allegoria dell'Aria [by Jean
 Lefebvre (Le Febvre) after Charles LeBrun (1619-
 90)] Tapestry Orig. LeBrun before 1669
 Location: Siena: Palazzo Pubblico, Sala del Concistoro;
 ? others at Florence:Uffizi, Pitti
 Frame (border) devoted to many wind insts of every
 conceivable type, including reeds and insts with
 many keys; transitional, pre-baroque. For engraved
 model of this, see LeClerc, 1679. Lefebvre leader
 of 2d Hautelisse Atelier at Gobelins, 1662-1700.
 Reproduced in: Small inadequate postcard at museum y

Gobelins 002
 Tapestry ? 1680's
 Location: Paris: Louvre (Salle Cressent)
 In same room as "Amours de Psyché"; lower left corner
 of this one shows an oboe-type inst with fish-tail
 reed

Gobelins 003
 "L'Air" de la Tenture des Eléments [after Charles
 LeBrun] Tapestry 17th C
 Location: Paris: Mobilier National
 This entirely different from Gobelins 001. Border
 decorated with insts; 2d and 3d strips show shaws
 with reeds
 Reproduced in: Mirimonde 1975:I, fig. 32 y

Gobelins 004
 "Shepherds dancing" [after Lefebvre (see Gobelins 001)]
 Tapestry 1689-92
 Location: New York: Metropolitan Museum, Musical Inst.
 Collection
 Reproduced in: Discussed in Post 1982

Gobelins 005
 Amours de Psyché, ou sujets de la Fable sur cartons de
 différentes peintres d'après Jules Romain
 Tapestry 1684 [? 1690]
 Location: Paris: Louvre (Salle Cressent; Inv. OA.5040 -
 CD 252)
 This tapestry [? by Jean LeBèvre] called "Danse des
 Nymphes; Se pièce de la Tenture des sujets de la
 Fable." Shows reclining, playing oboist (inst
 looks early but definitely not a shawn). Reed
 looks stapled.
 Reproduced in: Benoit 1971/1 y

Gobelins 006

Border and center of Alexander's entrance to Babylon
[by Jaus le fils after Charles LeBrun] Tapestry
1672

Location: ?

Painting of same tapestry by LeBrun at Louvre. Shows
shaws with reeds.

Reproduced in: Katalog der II. Gobelins-Ausstellung,
Belvedere-schloss, Wien, 1921, Plate 27

Gobelins 007

Side borders of Tenture des Saisons: Le Printemps [by
Etienne LeBlond, c1652-1727] Tapestry July
1708-October 1709

Location: Paris: Mobilier National (No 66-1)

Mars and Venus in middle; side borders contain many
wind insts. After design by De Melun (van der
Meulen ?)

Reproduced in: Les Belles Tentures de la manuf. royale
des Gobelins 1662-1792. Paris: Musée des
Gobelins, 1937, Pl II

Greippel, Johann Franz (1720-98)

Opernaufführung of Gluck's opera "Il parnasso confuso"
at Schloss Schönbrunn 24 Jan 1765

Location: Vienna: Schönbrunn Castle

Shows an orch., including oboists

Reproduced in: Altenburg 1973:III:fig. 2B y

Grove's Dictionary, 1927 edition

Photo of reed with article on oboe Photograph
1927

Page 675 shows reeds used by oboist (Anon.) who
accompanied Rossini on his visit to England in
1823. "One of several given to the late Dr. W.H.
Stone..." y

Guérard, Nicolas (?1648-1719) 001

Les exercices de Mars Etching 1700

Location: ?

Crude; mounted oboist. Slightly better than other
Guérard

Reproduced in: Fleuret Planche XX y

Guérard, [Nicolas (?François) (?1648-1719)] 002

Costumes militaires Etching

Location: ?

Crude depiction of mounted oboist

Reproduced in: Fleuret Planche XX y

Hahn, Hermann Joachim [publ.]

Altes und neues aus dem Lieder-Schatze, etc.
Engravings

Dresden: 1720

Location: ?

Halle, J. Samuel

Tab. VIII in Werkstätte der Heutigen Künste, vol. 3
Engraving 1763

Location: GB-Lbl, etc. (see RISM)

Page 378 y

Hogarth, William (1697-1764) 001

"The enraged musician" from the Beggar's Opera
Engraving 1741

Locations: London: V & A

Shows violinist (Prospero Castrucci, d.1760) reacting
to various street sounds, including a street
oboist. Reed difficult to see, fairly long. y

Hogarth, William (?) (1697-1764) 002

The laughing audience Etching

Location: Henk de Wit has an orig. copy

Used on CAL poster of concert with Frans y

Holme, Randle III (d.1707)

Academy of Armory Drawing c1688

Location: GB-Lbl (Ms Harl. 2034f 207b)

Shows oboe and reed; not very accurate.

Reproduced in: Langwill Bassoon p.2 y

Holzhalb, Johann Rudolf (1723-1806)

Der Musiksaal nach dem 1725 erfolgten Umbau 1761

Location: Munich: Bay. Staatsbibl.

The Music Room of the deutsche Schule, Zürich, depicted
and described from 1701. Shows a sort of Ob with
reed, in front of cello. H. was in Zürich.

Reproduced in: Schwab 42-3, fig. 13 y

Huet, Christophe (d.1759) 001

Concert simiesque et félin ? Watercolor

Location: Paris: Museum of decorative arts

Includes playing oboist on L side. Not accurate

Reproduced in: Pincherle; Mirimonde 1975:II, fig. 77 y

Huet, Christophe (d.1759) 002

la Danse

Location: Washington: National Gallery

Two dancing monkeys accompanied by an oboe and violin

- Hulin, Pierre (1669-1748) and Perrot (? Joseph Nicolas)
[Coronation of Louis XV] Engraving 1722
Location: [? F-Pn (Estampes)]
Very clear depiction of three oboes and a bassoon,
among other insts
- Krickel, G.
Einmarsch des Dragonerregimentes Graf Schulenberg in
Pasewalk 1721
Location: ?
- LaPorte, Roland de
"Devant la cheminée" Oil painting ? c1760
Location: Paris: Louvre
Shows bell of mid-century or later oboe
Reproduced in: Mirimonde 1965, plate 12, p 117;
1975:II, fig. 9 y
- LaTour, Georges de (c1600-52) [after]
Rixe de mendiants et de musiciens ambulants Oil
painting
Location: Musée de Chambéry
Shows shawm with particularly clear picture of a
surprisingly tiny reed
Reproduced in: Mirimonde 1975:I, fig. 130 y
- Lairesse, Gerard de (1641-1711) 001
"Casp. Bartholinus de Tibilis Veterus" [? Etching]
1679
Location: Amsterdam: Rijksprentenkabinet (T 101)
See Post 1982
Reproduced in: Post 1982 y
- Lairesse, Gerard de (1641-1711) 002
Title page to Lully's Ouverture avec tous les airs de
l'Opéra de Cadmus [Engraving] 1682
Location: Amsterdam: Rijksprentenkabinet (T 106)
See Post 1982
Reproduced in: Post 1982 y
- Lairesse, Gerard de (1641-1711) 003
Organ doors at the Westerkerk, Amsterdam Woodcarving
1684
Location: Amsterdam: Westerkerk
See Post 1982
Reproduced in: Post 1982 y
- Lairesse, Gerard de (1641-1711) 004
"Coelo Musa Beat" Etching n.d. [? 1680's]
Location: Amsterdam: Rijksprentenkabinet (Le. Bl. 28II,
in. nr. 32:226)
See Post 1982
Reproduced in: Post 1982 v

- Lairesse, Jan de (1674-?)
Title page to H. Anders's Trios, Allemande, Courante,
etc., Op 1 [Engraving] 1697-8
Location: GB-DFc; Lbl; NL-Lt
See Post 1982
Reproduced in: Scheurleer, Post 1982 y
- Lancret (1690-1745)
Scène d'Opéra (hommage à Rameau) Oil By 1745
Location: Present whereabouts unknown
Beautiful painting. Shows singers, dancers, and playing
musicians, including an oboe. Accurately painted.
Reproduced in: Mirimonde 1975:II, fig. 51 y
- Lavallée, Etienne de (c1733-93) [dit Poussin]
Le Bal de Saint-Cloud [engraved by St. Fessard]
Engraving
Location: ?
Orchestra includes an oboe
- LeClerc, Sébastien (1637-1714)
"L'Air" and "Printemps" in André Felibien's Tapisseries
du Roy [designed by Charles LeBrun] Engravings
Paris: 1670, 1679
Location: F-Pn (Estampes; Ad.106 and Ad.107, pp 28-29,
74-75)
Préaud, M. Inventaire du fonds français, tome 9, p. 71
(Paris: 1980) partly reproduces and discusses
- LePautre, Jean (1618-82) 001
La pompeuse et magnifique cérémonie du sacre de Louis
XIV Copper engraving 1654
Location: F-Pn
Shows "renaissance" winds rather than baroque.
Reproduced and discussed in Oldham 1961
Reproduced in: Schwab fig. 1; Oldham 1961; Flirt Planche
V; F-Pn Photo Nr. 64 C 23 590 y
- LePautre, Jean (1618-82) 002
"Orphée et une allégorie de la Musique" Engraving
[? 1665]
Location: F-Pn (Estampes)
Accurately drawn shawm, without reed. Compare these
instruments with those used in his coronation
picture.
Reproduced in: Mirimonde 1975:I, fig. 55 y
- Leriche
Pendants c1780
Location: [Seen in sale at Hôtel Drouot, 26 Mar 1971]
One of the two contains an oboe with other instruments.

- Levin, Katherine/Kauffmann, Hugo (1868-1919)
 "The clarionet player" [sic] Etching 1883
 Location: Montreal: Bruce Haynes
 Copy of late 18th C picture: Ob being played is 2-keyed
 Grenser type y
- Lindemann, A., and Tischler and Gildevorsteher
 Inlay on a Guild chest (Kiel) 1757
 Location: Schleswig: Landesmuseum
 Shows oboe band, players
 Reproduced in: Salzen p48 y
- Longhi, Seguace di P.
 Concerto Oil painting ? c1760
 Location: Venice: Ca' Rezzonico. Archivio Direzione
 Civici Musei di Venezia
 3 musicians: Hps, male singer, oboist
 Reproduced in: Ricordi Encyclopedia of music, under
 "oboe" y
- Magnasco, Alessandro (1667-1749)
 Allegory of Music (? Painting)
 Location: ? E. and A. Silberman Galleries, New York
 Depicts oboe, among other insts. Shown in Baltimore,
 1946
- Mariette, J. (c1660-1742)
 "Academia musica"; detail from Louis XIV protecteur des
 Academies [after J.B. Corneille] Engraving
 (? c1700)
 Location: F-Pn (Estampes)
 Group of playing musicians on L, including an oboe
 player
 Reproduced in: Mirimonde 1975:1, fig. 136 y
- Marot, Daniel
 Festive ball for the birthday of Prince William III of
 Orange Copper engraving 1686
 Location: Nürnberg: German. Nationalmuseum (Inv.-Nr. HB
 15223)
 Orch. in foreground includes at least three oboists
 playing
 Reproduced in: Schwab fig. 4 y
- Marvie, Martin (1713-1813)
 Fêtes données par la ville de Paris à l'occasion de 2e
 mariage de Mgr le Dauphin: le Char de Mars
 Engraving 15 Feb 1747
 Location: Louvre, Cabinet Rothschild
 Shows many military instruments, including playing
 oboists holding instruments horizontally. Oboists
 also included in the Char de l'Hymen in this
 series
 Reproduced in: Mirimonde 1975:11, fig. 60 y

- Maurer, James (fl. 1742-53)
 A view of [the] royal building for His Majesty's Horse
 & Foot Guards Line engraving 1753
 Location: Grace Coll. Pf. XII, Sh. 34, No. 51
 Shows a small wind band, playing; includes obs and bsns
 Reproduced in: Croft-Murray plate 110 y
- Mauro, Alessandro (?)
 Elevation du grand théâtre royal, pris de face
 [designed by A. and Girolamo Mauro of Venice]
 Engraving ("lavierte Tuschzeichnung") 1719
 Location: Dresden: Kupferstichkabinett
 The Dresden opera house "am Zwinger", stage and
 orchestra. Oboists almost impossible to make out.
 Reproduced in: H.C. Wolff Oper..., p 107, pl. 88 y
- Mearns, Richard II
 Title page to G. Keller's A Compleat method...
 [Etching] 1717
 Location: GB-Lbl (see RISM)
 Shows St Cecilia at the organ surrounded by trophies of
 instruments. Top RH corner shows crude oboe with
 reed
 Reproduced in: Mirimonde 1974, pl. 39; Decorative Mus.
Title P. #146 y
- Mersenne
 Illustrations in Harmonie universelle [etchings]
 1636
 Location: (see RISM)
 Reeds with "cervelat" (= racket) and shawms y
- Metzsch, Johann Friedrich (fl. 1735-51, d.1766)
 Performance of concerto Porcelain painting on bowl
 c1740
 Location: Bremen: Focke-Museum (Inv. Nr. 29.17)
 Shows five musicians playing around a table, music
 visible. Two violinists and cellist are seated,
 two oboists standing. Possibly a concerto by
 Johann Mathias Suhl. Embouchures, attitudes, and
 instruments all fairly clear. M. worked in
 Bayreuth. y
- Mignard, Pierre (1612-95) 001
 Decorations for the "Galerie des petits appartements du
 Roy", Versailles [paintings] [? 1680's]
 Location: ?
 "Sur l'entablement sont posés une chalemie..." Later
 engraved by L. Surugue.

- Mignard, Pierre (1612-95) 002
 Sainte Cécile Jouant de la harpe Oil painting
 1691
 Location: Paris: Louvre (Inv. 6641)
 Excellent pictures in lower RH corner of recorder and
 oboe, with reed and music. Copied by Anon and
 Cluer J. (Alexander title p.). Once owned by
 Nicolas Lebègue, acc. Benoit, but originally the
 King's and at Versailles from at least 1695.
 Reproduced in: *Mirimonde V*, pl. 139 and IV, pl. XLV y
- Mignard, Pierre (1612-95) 003
 Portrait of the Marquise Fouquières (?) as St Cecilia
 [variant of painting in Louvre] Oil painting on
 linen c1691
 Location: Schloss Löwenberg, Inventar
- Mizler, Lorenz C. von Kolof [author]
 Title page to Gespräch von der Musik... Etching
 Erfurth: 1742
 Plate shows an organ and four other instrumentalists
 playing; bass viol, Vn, Ob, Trv. Crude and
 inaccurate y
- Natoire, Charles Joseph (1700-77)
 Bal donné à Rome en 1751 pour la naissance du duc de
 Bourgogne Drawing 1751
 Location: Montpellier: Musée Atger
 Playing oboist in upper RH corner; not very detailed
 Reproduced in: *Mirimonde 1975:ii*, fig. 53 y
- Norman, Barak
 Trade card in viol 1700
 Location: (Offered to the V & A, London, in Sept. 78)
 Shows oboe and reed y
- North, Roger
 Picture of oboe reed in *Theory of sounds*, Ms. Pen
 drawing in margin c1710-28
 Location: GB-Lbl (Add. Ms. 32,534)
 Unusual looking reed; appears to be carefully drawn.
 Reproduced in: Roger North on Music (ed. Wilson, John)
 y
- Deding, Barbara Helène (c1707-58)
 Several pages on inside of lid of a clavichord by J.A.
 Hass, including "Prospect der...Stadt ALTONA"
 Etchings, (aqua fortis) Inst 1744, Altona 1748
 Location: Brussels: Conservatory
 Under Altona are 5 pages of depictions of figures
 playing insts. On the 2d p from L, lowest row, the
 3d and 4th figures from L are Ob and Bsn players

- Olivero, Pietro Domenico
 Interior of the Teatro Regio, Turin, during a
 performance of Feo's opera "Arsace" Painting
 1740
 Location: Museo Civico d'Arte Antica, Turin
 Depicts stage, part of audience, and orch. in pit.
 There appear to be 2 oboists facing away from
 stage
 Reproduced in: *GrVI 19:262* y
- Parrocel, Charles (1688-1752)
 L'Ordre de la marche pour la publication de la paix
 Painting 1 Jun 1739
 Location: Musée Carnavalet
 Depicts a thousand people, including the XII Grands
 Hautbois on horseback
 Reproduced in: *Firt Planche XX*; *Mirimonde 1975:ii*, fig.
 55 y
- Patch, [Thomas (1720-82)]
 A musical party Painting c1750
 London: National Portrait Gallery (Negative # 8359)
 Playing oboist in middle foreground. Embouchure, reed,
 instrument and music all possibly discernable.
 y
- Pater, Jean-Baptiste-François (1695-1736) 001
 Rejouissances pastorales [Oil] By 1736
 Location: London: Wallace Collection
 Shows beautiful oboe
- Pater, Jean-Baptiste-François (1695-1736) 002
 la Danse [Oil] By 1736
 Location: London: Wallace Collection
 Oboe somewhat visible
- Pepys
 Depiction in The Illustrated Pepys, ed. Robert Latham
 [Orig. c1670]
 [? Shawm players in different positions]. NB date
 Reproduced in: See title
- Picart (Picard), Bernard (1673-1733)
 La Procession du Saint-Sacrament le jour de la Fête-
 Dieu [? Etching]
 Location: ?
 Shows 2 Obs

Follard, Robert (1755-1838)
 Concert in Vauxhall Gardens [after Thomas Rowlandson]
 Engraving, acquatinted by F. Jukes 1785
 Location: Coburg: Kunstsammlungen der Veste Coburg,
 Inv. Nr. XI/70/34
 Pub. J.R. Smith. Shows 2 Obs playing under canopy
 outside, insts held rather low. Seen also in
 Comtesse's exhibit (dated there 1782)
 Reproduced in: Lesure Bild; Schwab 60-61 y

Fraetorius, M.
 Plate XI in De Organographia
 Shaws reeds
 Reproduced in: Langwill Bassoon y

Prellieur, Peter [ed.] 001
 Title page to the Modern Musick-Master ? Engraving
 1731
 Shows ensemble, including a playing oboist. Hand
 position unrealistic

Prellieur, Peter [ed.] 002
 Front page to Instructions upon the hautboy, W 61
 Engraving London: 1731
 Location: (See RISM)
 Shows playing oboist
 Reproduced in: Facsimile pub. Bär. y

Prudhon, Pierre Paul (1758-1823)
 Projet de carte d'invitation pour un concert
 [? Drawing]
 Location: unknown
 Shows bell of oboe
 Reproduced in: Mirimonde 1975:11, fig. 14 y

Punt, I. [? Jan] (1711-79) 001
 Four Swiss Guards playing oboes ? c1750
 Location: On DHgm "fiche" 41 (2,4)

Punt, I. [?Jan] (1711-79) 002
 Four "Hollandsche Guardes" [? Painting]
 Location: DHgm fiche 41 (3,1)

Punt, Jan (1711-79) 003
 Title page to Mahaut's Maendelijks Musikaels
Tijlverdrif [Engraving] Amsterdam: 1751/2
 Location: GB-Lbl
 Lower LH corner shows two oboes without reeds
 Reproduced in: Dec. Mus. Title Pages, #158 y

Punt, Jan (1711-79) 004
 [Wind ensemble] (after P. v. Cuyck) Copper engraving
 [? 1740]
 Location: Binningen: Ernst W. Buser private collection
 Shows 8 marching, playing musicians: 4 oboists, 2 Hrns,
 2 Bsns
 Reproduced in: Joppig 47 y

Ranson, Pierre (1736-86)
 Numerous trophées de musique; some probably depict
 oboes
 Location: ?

Riedigger
 Collection of drawings of instruments
 Location: NL-DHgm

Rijkel, C.
 Trade card Amsterdam, c1705
 Shows oboes but without reeds
 Reproduced in: Langwill Index p 132 y

Robert, Jean (c1652-1715)
 Attributs de musique champêtre Sculpture on two
 large vases 1684
 Location: ? Versailles
 Commissioned by Louis, designed by Mansard for
 Versailles. Includes oboe and reed
 Reproduced in: Briqueville 16, 17 y

Roberts
 Title page to Fischer's Compleat Tutor, W119
 Engraving c1770
 Location: see Warner
 Standing oboist, playing
 y

Roberts, Thomas (1711-71)
 Wall stuccos 1754 Upper Library at Christ Church
 College, Oxford
 One trophy includes an oboe and reed
 Reproduced in: Halfpenny, GSJ XXVIII y

Roussel, C.
 Title page to Charpentier's Motets meléz de symphonie
 Engraving 1709
 Location: (See RISM)
 Upper RH corner shows shaws with "Diderot-type" reed
 Reproduced in: Dec Mus Title Pages #119 y

- Rowlandson, Thomas
 "Concerto Spirituale" Drawing
 Location: Huntington Art Gallery, San Marino, CA
 Caricature of Fischer and Abel, both playing. Nature of work precludes accuracy.
 Reproduced in: The Symphony 1720-1840 Series E vol. II (New York 1983) y
- Rubens, Peter Paul (1577-1640) [?]
 Un pastore ed una donna con gli attributi dell'abbondanza Painting ? 1640
 Location: Lucca: Galleria del M. e Mansi a S. Pellegrino
 Detailed, clear depiction of man playing a shawm/oboe. Good idea of embouchure
- Rugendaes, G. Ph. (1666-1742)
 Mounted oboist (dragoon) Drawing ? 1730's
 Location: Staatlichen Kunstsammlungen der Veste Coburg
 Reproduced in: Salmen Sozialstatus y
- Sanzio, Rafael
 Mural
 Location: Rome: Vatican
 Shows various instruments, including oboe with reed
- Schmidt, Georg Friedrich (1712-75)
 "A chamber concert" [appeared in first German and French editions of Quantz's Essai] Engraving 1752
 Location: (See RISM)
 Lower middle depicts oboe and reed, clearly with long staple
 Reproduced in: Reilly tr.; Salmen 1969 p102 y
- Silvestre, Israel (1621-91)
 Plaisirs de l'Isle enchantée Book with text and engravings Paris: 1673
 Location: F-Pn (Estampes)
 Depicts performance by Lully, 7-10 May, 1664. Oboe-type insts appear in the first four plates of the "première journée", but the insts are not clear enough to distinguish Obs from shawms.
- Simonneau, Charles (1645-1728)
 Title page to M. Marais's Pièces en trio Engraving Paris: 1692
 Location: F-Pn; GB-DRc; F-G; Pc; V
 Oboes with reeds shown in upper corners, all somewhat stylized
 Reproduced in: SPES facs.; Bowers 1977, 11 y
- Steen, Jan (1626-79)
 De Dansles Oil painting [? c1660]
 Location: Amsterdam: Rijksmuseum
 Depicts young girl playing shawm; very good embouchure study y
- Staudner, Johann Christoph
 Musikalischer Zeitvertrieb [after Paul Decker the elder, 1677-1713] Copper engraving n.d.; c1710
 Location: Halle: Händel-Haus (Sign. B 5 - VI,29)
 Decker worked in Bayreuth. Shows performance of cantata including playing oboist.
 Reproduced in: Salmen 1969, fig. 35 y
- Tardieu, Nicolas Henri (1674-1749)
 Les douze Grands Hautbois du Roi at the coronation of Louis XV, 1722 Engraving 25 Oct 1722
 Location: F-Pn; Louvre
 Lower LH corner shows 12 Hautbois, including 5 oboes, 2 large oboes, 3 oboes of unsure size and 2 bassoons.
 Reproduced in: Thoinan 1894; Harrison & Rimmer; Salmen Soz.; Lesure Musik und Ges.; Tibia calendar; Flirt Pl V y
- Teniers, David (1610-90)
 The painter and his family Oil painting ?1680's
 Location: Berlin: ehemals (formerly) Staatliche Museen
 Outdoor chamber music, with an oboe (clearly long-stapled) on table with music on top.
 Reproduced in: Lesure, Musik u. Ges. 1966:43 y
- Thompson, Peter
 Trade card
 Reed on oboe.
 Location: (Seen at Comtesse's exhibit)
- Trouvain, Antoine (1656-1708) 001
 Title page to M. Marais's Pièces à une et à deux violes Engraving Paris: 1686
 Location: GB-Lbl (see RISM)
 Shows bottom half of oboe
 Reproduced in: Dec. Mus. Title Pages, #114 y

- Trouvain, Antoine (1656-1708) 002
Fourth chamber of the state rooms at Versailles; fifth chamber Copper engraving c1690 (1696 Fleuret)
Location: F-Pn
Obs and other insts being played for dancing
Reproduced in: Lesure 1966; Flirt Pl. XXI; Benoit Pl. V y
- Vallayer-Coster, Anne (1744-1818) 001
"Les attributs de la musique" Oil painting First displayed 1771
Location: Paris; Louvre
Shows bottom part of oboe
Reproduced in: Mirimonde 1965, plate 16, p 119 y
- Vallayer-Coster, Anne (1744-1818) 002
Attributs de la vie militaire Oil 1777
Location: [? Louvre]
Includes an oboe
- Van Loo, Louis Michel (1707-71)
Philip V of Spain and his family Oil painting ? c1740
Location: Madrid; Museo del Prado
Realistic. Shows playing oboist and flutist in upper R quadrant
Reproduced in: Hogwood 1980, ill. 48 (p. 71)
- Vanderhagen, A.
Fingering chart in Méthode nouvelle... W 175 [Engraving] c1790
Location: see Warner
Page 2-3 shows oboe and reasonable depiction of reed. y
- Verbeeck, Frans Xaver (1686-1755)
Concert in park Oil painting
Location: Schloss Rychnov n. Kneznon (Reichenau, Bohemia)
Shows oboist playing, with a lute and possibly Hps
Reproduced in: Buchner, A. Musikinstrumente... Prague, 1971 y
- Vermeulen, Cornelis (1642-92)
"Allégorie de la musique", after P. Mignard Engraving [Original c1665]
Location: F-Pn (Estampes)
Shawm-like inst in top LH corner; ren.-type flute also appears, but baroque recorder.
Reproduced in: Mirimonde 1975:1, fig. 19 y

- Verscheure-Reynvaan, J.
Fingering chart in Muzikaal Kunst Woordenboek [Engraving] 1795
Location: (See RISM)
Drawing of oboe and reed y
- Vogt, A.G.
Fingering chart in Méthode pour hautbois (Ms.) Drawing c1813
Location: (See Warner)
Picture of reed included y
- Voiriot, Guillaume (1713-99)
"La famille Perceval" Oil painting By 1799
Location: Private collection. Formerly Coll. of Prince Henry of Prussia
Reproduced in: Mirimonde 1968, pl. 28 y
- Volpato, Giovanni (1733-1803)
Trophée d'instruments de musique, after Raphaël Engraving 1774
Location: Paris; Louvre
Shows shawms and oboe with reeds, not good quality
Mirimonde I pl. 21 (p 122) y
- Vény, L.A.
Fingering chart in Méthode complète pour le hautbois Hand drawing c1828
Location: see Warner
Pages 26, 28, 30 depict 8- and 15-keyed oboes with reeds. y
- Watteau, Antoine (1684-1721) 001 [after]
Stylized Ob and Bsn players By 1721
Location: ? [GM Fiche 20(1, 2)]
Playing; not realistic
- Watteau, Antoine (1684-1721) 002
"A young Savoyard" Drawing By 1721
Location: Paris; Palais des Beaux-Arts (Detuit coll.)
Shows the upper half of an oboe with reed. Roughly sketched.
Reproduced in: Parker, K.T. 1931. The drawings of A.W. Plate X p 42
- Watteau, Antoine (1684-1721) 003
Savoyarde with "marmotte" Oil painting By 1721
Location: Leningrad; Hermitage
Shows clear reed. Sketch of Paris street musician may be study for this.
Reproduced in: Kinsky 224

- Watteau, Antoine (1684-1721) 004
Paris street musician Sketch By 1721
Location: Paris: Musée du Petit Palais
Possible study for Savoyard painting. y
- Watteau, Antoine (1684-1721) 005
Design for trophee or wall ornament By 1721
Location: [DHgm fiche 19 (3 2)]
Stylized oboe and clear reed
- Watteau, Antoine (1684-1721) 006 [engraved by J. Moyreau]
L'Alliance de la musique et de la comédie Engraving
By 1721
Location: Louvre, Cabinet Rothschild
Shows stylized oboe with reed
Reproduced in: Mirimonde 1975:II fig. 12 y
- Watteau, Antoine (1684-1721) 009
Les Plaisirs du Bal [after Jansens] Oil By 1721
Location: Dulwich; Museum
Orchestra includes oboe. Painting copied by Pater and
engraved by Scotin
- Watteau, François-Louis-Joseph (1758-1823)
Danse devant l'estaminet [? Oil]
Location: [Sotheby's sale 11 Mar 1964]
Shows oboe and musette
- Weigel, Johann Christoph (c1654-1726) 001
Österreichisches Hautboistencorps Copper engraving
End 17th C
Location: Berlin: Staatsbibl.
Reproduced in: Hildebrand II:10 (Tibia 1/78) y
- Weigel, Johann Christoph (c1654-1726) 002
Musicalisches Theatrum Hand-colored copper
engraving Nürnberg c1720
Location: D-B; F-Pn: Vma 991 (I 22)
Playing oboist with poem underneath comparing Ob and
Schalmel. Inst inaccurate; top too long, keys
barely discernable. Reed partly visible (appears
to be fairly short).
Reproduced in: B&R facsimile 1961; MGG 1801 y
- Wilkie, David (1785-1841)
Wind quintet with spinet Painting c1815
Location: ?
Reed on oboe quite visible.
Reproduced in: Jansen The Bassoon I, frontispiece;
Langwill Index 311 y

- Wille, P.A. le fils (1748-1821)
[Scene d'Opéra-Comique in the salle de la Comédie
italienne] Pencil drawing c1764
Location: Paris: Bibl. de l'Opéra
Shows orchestra, including oboe
- Wolff, J. [? Jeremias (?1663-1724)]
Musikalischer Aufzug bei Dresdener Hoffest
Augsburg 1718
Location: ?
2 groups of 4 reed players
Reproduced in: Hildebrand I:58 (diss.) y
- Zoffany, Johann Joseph (1733-1810) [?]
The oboe player Oil painting c1770
Location: Smith College Museum of Art Northampton MA
Formerly attr. to Reynolds. Excellent portrait shows
ob and reed. Z. also painted Gainsborough portrait
(NB connection to Fischer, of whom, however, this
is probably not a portrait).
Reproduced in: GrVI (Oboe) y

FoMRHI Comm 745

Richard Shann

Happy, Happy Transposition

In Comm. 735 Nicholas Meeus takes issue with my statement that the vast majority of pieces ca 1600 can be transposed without exceeding the limits of the mean-tone system. He uses the virtuoso solo keyboard repertoire to argue against this. I doubt that this was a large part of what was done on keyboards at the time, but more importantly, there would be no reason to transpose such music. A dip into the vast collections of songs (1) published in Amsterdam about this time amply confirms what I said: a singer finding one of these a little high or low could happily ask for a transposition without running out of sharps or flats.

(1) Nede landtsche vredenck - clancq,
Amsterdam 1676 etc.

FoMRHI Comm. 766

THE WAY FROM THOIRY TO NUREMBERG

or the two Nuremberg historical music wire gauge systems

Rémy GUG

transl. Anita EHLERS & Denzil WRAIGHT

If someone succeeded in establishing a dialogue with a master wire drawer of the past, he would encounter a large number of problems. Apart from the problems of language there would be of course problems caused by the difference in outlook. The old way of posing questions and looking for answers was in many respects distinctly different from ours. These difficulties, too, are encountered by the historian of science and technology.

During the last decades several interesting inquiries have been undertaken in order to establish how the gauge numbers of early music wire correspond to today's metrical values of diameters. This study pursues the same objective. However, our method, to be described briefly in this paper, allows a much closer approach to the problem.

In the history of technology one obstacle has always been the human propensity for attributing our present way of thinking to people of other times.

The art of wire drawing underwent drastic changes after the historical art of building harpsichords vanished. Therefore it seems important that each problem should be broken down so as to yield three questions.

When a problem arises, is it dealing with :

1. a technology unknown to the old Master ?
2. a technology we share with them ?
3. a technology or procedure (not yet) known to us which was in use at that time ?

This method can be followed only if one tries to realize constantly what an artist or craftsman living in a given era could have known. Thus, one must forget what science and technology have discovered and invented after that point of time. If, in our case, one does not keep in mind the great changes in the measurement of wire which were brought about in the course of the 19th century, one could get bogged down forever in calculations never done by the Ancients and one might ignore those methods that they really used.

What branch of knowledge of the time (from the 15th century until the middle of the 19th century) could easily provide the wire drawer with a useful tool for making wire ?

Up to about the beginning of the Industrial Revolution, science and technology depended almost exclusively on EUCLID's Bible (1). The great Johannes KEPLER in his work, published in Linz in 1616, enumerated to whom Geometry might be of indispensable service : "Das uralte Mütterlein aller un jeder Obrigkeit/Gemeinden/ guter Würte/ vernünftiger Kaufleute/ Freykünstler und Handwerker/ namens GEOMETRIA..." ("The ancient mother of all authority, community, of good innkeepers, astute merchants, artists and craftsmen, called GEOMETRIA...") (2).

The wire drawers of course were among those craftsmen. Figure 1 shows part of EUCLID's work representing the geometrical foundation of wire drawing. From a purely stereometric point of view the making of a round wire can be viewed as deforming a cylinder of a given diameter into another cylinder (of smaller diameter) while conserving the volume. In plain language, the change of dimensions caused by this procedure can be expressed thus :

- if the diameter is halved the length of the wire increases fourfold
- if the diameter is halved the cylinder's surface doubles (transverse sections excluded)
- the volume, hence the weight, always stays the same.

Consequently there are three factors to be considered : diameter, length and weight. Starting with these the craftsman can make use of a simple tool to help him recognize the dimensions of a piece of wire in order to express them in corresponding units.

THE WIRE MICROMETER

One instrument, well known to us and universally used today, is the **micrometer** which serves to measure the first of these values, the diameter. Though astronomers used this tool as early as the beginning of the 17th century, the wire drawers made use of it only toward the end of the 18th century.



Abb. 1



Figure 2 illustrates the solution of "measuring the diameter of weak music wire" invented in 1780. (3)

This "micrometer" became known only gradually in the course of the 19th century, when it developed into the modern "Palmermicrometer". Thus we have to inquire whether and how wire was "measured" before this time.

THE WIRE GAUGE

One answer known today can be found in the excellent paper of Friedmann HELLWIG (4) concerning wire gauges.

As the following extract will show, we are not dealing with "measurement" in the modern sense of the word. A wire gauge does not give a value in metric (or non-metric) terms. These rules offer the user an opportunity for easy classification which has nothing at all to do with "measurement". The different slots represent a number of "groups" in which a given wire might find its place. It is not possible, however, to compare two pieces of wire belonging to the same "group". The area of tolerance is too wide. Friederich HARZER seems to sense a considerable disadvantage in this, when he wrote at about 1850 : "The wire gauge is a piece of metal with slots and holes of different widths, which correspond to the diameters of different kinds or numbers of wire. Each slot is marked by a corresponding number. In order to measure a piece of wire one tries to put it into the notches until the smallest one is found among all those big enough to let the wire pass. This one is considered to give the thickness of the wire and the corresponding number of the slot gives the right gauge number. It is obvious that in this way a very exact result cannot be obtained. Assuming that among the slots there would be one, the width of which is just a very little smaller than the diameter of the wire in question, then to this wire will be ascribed the number of the next bigger slot, though it might differ much more from it than from the one it could not fit into. This inaccuracy will occur the more often and will be the more important the larger the differences between the subsequent slots or holes are".(5)

Our aim is to establish a correspondence between the ancient gauge systems and modern millimeter values of diameters . If the makers of ancient music wire tested their work only with wire gauges, then today we have a very small chance of arriving at an answer to this question. The tolerance is too large and we, therefore , would never get a clear picture.

To improve our chances we must adopt a wider view, one that tries to include all aspects of historical wire drawing. Thus, we learn that the drawers of gold or silver wire could not have been satisfied with the control described above. We will give an example to show that it cannot be imagined that these artists, working with very valuable precious metals, would have tested their expensive products with such an inexact instrument.

Let us consider a gauge with a slot N°6 adjusted at .300mm. and the next slot N°7 at .260mm. We already know that wire checked with slot N°6 may have diameters varying between .300mm. and .261mm. While this tolerance may not have disturbed the needle maker, it was important for the drawer of gold or silver wire. The greatest part of the latter's production was sent to the gold embroiderer who had to embroider a given length of velvet or silk from a given spool of wire. He thus knew, for example, that one spool N°6 would usually do. This would have worked only when the wire drawer took pains over always drawing wire of equal thickness. If for example a certain weight of gold wire N°6 measure 66 meters, if the diameter is .270mm., then, with the weight staying the same, the length decreases to 54 meters, if the diameter measures .299mm. The gauge number remains the same. A loss in length like this would be unacceptable to the craftsman working with precious metals.

The solution of these puzzles involving diameter, length and weight becomes possible when, treading in the footsteps of early mathematicians, the diameter is eliminated. Focussing all attention on length and weight allows us to solve a good deal of the gauge number riddle discussed so often during the last years. In this case we must approach the problem of wire drawing from a quite different point of view.

Our modern understanding, as seen from the geometric point of view, defines wire drawing as **the refining of the diameter of a wire to a given measurement.** The micrometer can show whether this has been done with sufficient accuracy.

This definition does not apply to the problem as the old Masters saw it. As we may guess from the example above, wire drawing meant a **method which allowed lengthening a wire of known weight and length until a desired length was achieved, without changing the weight.**

There has been no talk (yet) of diameters. This is why that old tables (prior to the end of the 18th century) listing wire gauge numbers and corresponding diameter values have never been found. We must do without our modern way of thinking. A meaningful approximation to historical fact requires completely new thinking...!

NUREMBERG 1621...

The definition given above which held in time past must necessarily have been realized by means which were as simple as possible.

How could the prescribed length-weight relationship be best checked ?

Searching through archives and printed sources we found two tools which are all but forgotten today.



1. THE REEL

This instrument was used to check the finished product. Thanks to the archives of the City of Nuremberg we were able to lay hands on a document of great value for this paper.

Figure 3 shows the most interesting extract of the agreement drawn up in 1621 by the town's twelve gold wire drawers and the Hagelsheimer-Held family. We will discuss the values given there later. From this contract we learn that the precision of the wire length as fixed by the legislator could be checked in an extremely simple way, namely with "einer darzue gemachten sonderbahren Haspel uff welche gewiese Ellenlänge gerichtet ist hinten her gemessen un justificirt werden" ("a special reel built for this purpose on which the lengths can be measured and confirmed").(6)

A carefully weighted coil of wire would thus be rolled on a reel and by counting the turns the length of the wire to be checked could be determined quit accurately. Length and weigh had to fit very exactly.

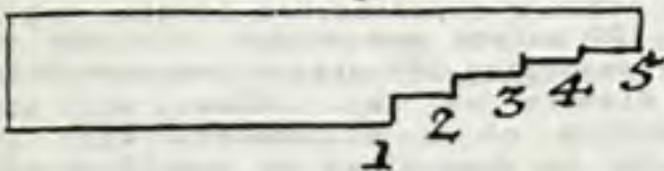
2. THE "ZÄNGELMASS"

How did the wire drawer attain the prescribed length in his workshop ?

Some sources mention the use of a little oblong plate made of sheet brass, the Zängelmass.

The most detailed description and explanation of how to use the Zängelmass is provided by JACOBSON (7). In order to be able better to visualize this clever tool we reproduce, in addition, the copper engravings found in the works of SPRENGEL (8) an HALLE (9) Figures 4 & 5.

Fig. 4.



Dratzieher. 

"Zängelmass : An oblong fourside copper sheet one end of which is cut away obliquely. This slant is incised in a steplike manner, each step longer than the preceding one, till the longest one reaches the longest side of the plate. The wire drawer can see from this plate whether the fine wire will have lengthened when drawn through a hole of the drawing plate. He will for this purpose measure a part of the wire with the shortest side of the plate, keep the two marks on the wire which he draws through the hole. If the marked part has now been lengthened such that it touches the longer side or the upper part of the Zängelmass, the hole in question will have the required size and the wire drawer says that his wire has been lengthened four "Zängel", since the plate has four incisions (Zängel). If the marked wire reaches only up to the second or third Zängel but is supposed to reach the fourth, then the hole is too large and another one has to be chosen or vice versa".(10)

The few printed sources mentioning this Zängelmass (evidently it has been kept secret) tell little about its exact dimensions. By considering interrelated pieces of information we finally succeeded in calculating these dimensions and arrived at the result most important for us : the lengthening ratio. (See "Musique Ancienne" N°18, p.4-76). This allows us to get a clearer picture of the Nuremberg gauge systems.

We know now that the ancient wire drawer worked exclusively and admirably with length and weight, the two cornerstones of the early art of wire drawing.

This lost procedure has a fortunate consequence for our topic. Up to now it has been assumed that the old makers, without knowledge of our modern micrometer, were unable to work precisely with their wire. One finds, again and again, the remark that in studying the diameter values of old strings one should take into consideration a tolerance of one or more hundredths of millimeters. An example will show, though, that the Nuremberg Masters drew their wire with diameters that are accurate up to the thousandths of millimeters. Thus we notice that they reached the same accuracy as we do, though their path came from a different direction.

The wire drawer has to achieve a prescribed length. Let us assume that this length be 100 meters per weight unit. If the error is 5%, the length thus measuring 105 meters instead of 100 meters, then the value of a diameter of, say, .200mm., will drop to .195mm. Thus 5 thousandths of a millimeter. With the Zängelmass the lengthening can be determined or regulated with precision. What is done with the sample and the Zängelmass during checking is the same as what is done during the work afterwards on a larger scale. Let the sample measure 2 (Nuremberg) inches : 48,8mm. Using a given lengthening ratio, it should for example measure precisely 54,2mm. If the error is 5%, as above, its length would be 56,93mm, thus almost 3mm too much, as any wire drawer could easily recognize on his Zängelmass. An error in the order of 4 in length will account for an error in the order of 2 in diameter only.

Though we do not know how accurately the old masters worked (the Hagelsheimer-Held tables do give us an idea of how precisely they should have worked, though, see above) we do see now that it is meaningful and even indispensable from now on to express the diameters of surviving strings in thousandths of millimeters. This quantity (diameter), directly depending on the two other one, is the only one which we can measure centuries later. Of length and weight we do not (yet) know anything.

MEASURES AND WEIGHT

Talking of length and weight in past time, one talks in terms of feet, yards, commercial pounds and ounces... Thus the early art of wire drawing is directly tied to the ancient metrological systems.

In studying the Nuremberg system of weight and measures, we found that the application of four different Nuremberg "Werkschuhe", as it has been documented several times (see *Musique Ancienne* N°18, p.31-34) had led to the wire drawers using a most refined method. Closer examination showed that the lengths of the four "Werkschuhe" had the same relation as the specific weights of the four metals used.

"Werkschuhe" N°1 = 27,8cm
 "Werkschuhe" N°2 = 29,3cm
 "Werkschuhe" N°3 = 30,6cm
 "Werkschuhe" N°4 = 32,97cm

"Werkschuhe" N°1 = Copper
 "Werkschuhe" N°4 = Silver

"Werkschuhe" N°2 = Brass
 "Werkschuhe" N°3 = Copper

"Werkschuhe" N°2 = Iron
 "Werkschuhe" N°4 = Copper

"Werkschuhe" N°3 = Iron
 "Werkschuhe" N°4 = Brass

In everyday work these relations took the following form : to begin with there was a metal cylinder, at that time called a "Zain" and its dimensions had to be very accurate. A Zain of iron with a diameter of 1 inch (1/12 of Werkschuh N°4) and weighing 3 commercial Nuremberg pounds has a length of 1 Werkschuh N°4. A Zain of **brass** of equal diameter and with the same weight is 1 Werkschuh N°3 long. And a Zain of **copper** shows in the same case

a length of 1 Werkschuh N°2. It would take up too much space to list all advantageous combinations.

Let us rather draw the conclusions from the relations given above. If, on the one hand, the wire drawers always started with a Zain, the mass of which was standardized, and if, on the other hand, they kept the lengthening ratio with help of the Zängelmass constant, then **the diameters obtained would be standardized.** There should be evidence of this on the old Nuremberg strings.

The table in Figure 6 shows the length of various products of the gold wire drawers. A table like this that would acquaint us with the standard length of the Nuremberg music wire has not yet been found. In order to get a reliable picture we therefore must proceed in a different way.

-1621-			
ARGENT ET ARGENT DURÉ (19 mm)		CUIVRE DURÉ	
Longueur (mm)	Diamètre (microns)	Longueur (mm)	Diamètre (microns)
N°4		176	145,7
N°5		196	138
N°6	348	276	116
N°7	500	500	86
N°8	602	728	71
N°9	912	992	65

THE NUREMBERG STRING DIAMETERS

Even if rather scarce - the data given by the German Karl KARMARSCH (11), the French professor at the Ecole Polytechnique de Paris HACHETTE (12) and the famous French scientist COULOMB (13) permit, in combination with the Nuremberg lengthening ratio calculated by us, to find the exact diameter values of all Nuremberg strings. We list in line A of our summary table the diameter values as they have been established with help of the Zängelmass.

Let us check the reliability of this data. As indicated above, an acceptable agreement between our values of line A and the values of diameters of old strings should be recognizable.

Line B lists the diameter values which G. Grant O'BRIEN (14) took from the BLANCHET harpsichord in Thoiry (France) and line C those which Hugh GOUGH (15) found in 1957. The coincidence between these data from very different sources can, of course, not be purely accidental.

THE GAUGE NUMBERS

As we all know, music wire used to be sold according to numbers, as for example, shoes are sold even today... Most authors studying the correspondence between these numbers and modern metric diameter values during the last twenty years came time and again to the conclusion that the position of these

numbers on the scale of diameter is probably accidental. That, however, is not the case.

The history of the art of wire drawing reveals to us that the craftsmen of that time fabricated, at the same moment in the same workshop and with the same methods, gold and silver covered copper, brass and iron wire. Even more important, they plated only the middle third of the corresponding Zain. The two blank parts served as music wire. Since they were obliged to use the Zängelmass in order to work with the greatest possible precision in the case of gold and silver plated wire, we can understand easily why the values of the diameters of old strings fit a scale that corresponds to our line A.

Again we must consider length and weight if we want to understand the numbering of the music wire and disprove the arbitrariness that has been assumed up to now.

We get a first important clue from the Nuremberg brass wire system. Figure 8 (16) With the exception of the first value, which we will discuss later, all others fit well the Nuremberg scale. Line D gives the numbers listed by THOMEE.

The second and third clue we already know. Line E contains the numbers published by HACHETTE and COULOMB (17) and line F those of KARMARSCH (18), also mentioned above. A superficial look at these lines gives rise to a most uncomfortable feeling of anarchy. That these numbers, however, were not put on the lengthweight-scale according to the opinion of each wire drawer is clarified most valuably by a quotation from the "History of trade" by REHLEN, published in 1855 (19). There we are told that the Nuremberg brass strings were manufactured "in 9, the steel ones in 15 different thicknesses ; a pound of N°11 measures 10250 feet ; of the brass strings the pound on the average measures 4% more". If we combine these data with those HACHETTE's : "3221 meter of wire N°11 weigh 1 pound", a long hoped for door opens. Conversing this data (20) we arrive at the following conclusion:

**The pound of Nuremberg wire N°11
measures 11000 feet (21)**

Nürnbergers Probe für messingene Klavieraiten (Saiten aus Eisen nach Gleicher 2.)	
Nr.	Millimeter
	V
9 0	1,10
8 0	1,08
7 0	0,97
6 0	0,87
5 0	0,83
4 8	0,74
3 0	0,68
2 0	0,60
0	0,54
1	0,53
2	0,48
3	0,41
4	0,37
5	0,33
6	0,28
7	0,25

However this definition does not apply to all gauge numbers. For example N°6 : should be 6000 feet long, N°3 : 3000 feet... Everybody knows that the length increases in geometrical progression, whereas the gauge numbers are in arithmetical progression. They cannot be superimposed. Already at that time a solution for this problem of difference of progression had to be found.

From THOMEE we see that one pound of brass wire has a length of exactly 1000 Werkschuh N°3. This wire must measure 11000 Werkschuh if N°11 is to be produced. The fabrication of a wire N°11 therefore may be described as **lengthening a wire N°1 eleven times**, weight of course being constant.

To get this result in Nuremberg, where we know the smallest lengthening ratio (1,056), an overall lengthening had to be achieved which could be expressed as:

$$(\text{length N}^\circ 1) 1,056^{44} = \text{length N}^\circ 11$$

Thus it requires 44 of the smallest steps to get from N°1 to N°11. That poses a question : how can 11 whole gauge numbers (or 21 if halves are numbered, too) be distributed evenly on the 45 rungs of the "ladder" (diameter values) ? Without doubt one or the other rung had to be omitted. The old Masters did just that, for a look at line D demonstrates that the gauge numbers of the Nuremberg brass wire are not spaced evenly on the diameter scale (line A). If this conclusion cannot be refuted and if it is disturbing to our modern thinking, there arises another question: Why were the wider spaces put where we find them ? Why was this solution of spacing the gauge numbers chosen ? Is the answer to be found at the wire drawer's ? Could instrument builders account for this ?

DIFFERENT METALS... DIFFERENT DIAMETERS

Let us pass on to the next topic. The drawers manufactured wire from iron, brass and copper. These materials, suited for wire drawing, do not have the same specific weight. Therefore, wires made from these metals (alloys) could not have the same diameter, if length and weight were the same. If the diameter of iron and brass wire were to be identical, then the other data (length and weight) had to be changed, which was not a problem to the craftsman of past time, since he was used to dealing with different feet and pounds anyway.

Let us remember REHLEN's observation mentioned above : given the gauge number, a pound of Nuremberg brass wire measures 4% more than a pound of steel strings. This 4% is not an arbitrary number. It corresponds exactly to the relation between Werkschuh N°2 and Werkschuh N°3. Thus the brass wire was measured with Werkschuh N°3 (as in THOMEE, see above), whereas Werkschuh N°2 had to be used for iron. Then the diameters would be equal.

If, however, the same Werkschuh were used for the two metals, different diameters would result. That brings us back to THOMEE's data. The diameter value of N°9/0 listed there does not fit the Nuremberg scale. All other values differ only very little, therefore this difference seems to be a big one, for which we suggest an explanation. This divergent value (1,10mm) relates to the next one as the diameter of an iron wire relates to that of a brass wire of equal length and weight.

$$\frac{1,06}{1,10} = \frac{\text{diameter brass}}{\text{diameter iron}}$$

The heading of THOMEE's table says that brass and iron wires have the same size. Thus the drawer would start his work by drawing the diameter of the iron wire to equal that of the brass wire. The first two slots of this wire gauge served to check the precision of the result : thereafter brass and iron had identical diameters and could be checked with the same gauge.

THE IRON AND BRASS NUMBERS...

Let us now look at the places where THOMEE's brass numbers and HACHETTE's iron numbers are listed on our summary table. It is quite remarkable that brass numbers are shifted with regard to the iron numbers in such a way that the iron diameter is always larger than that of the brass wire of same gauge number. We already know the explanation. It stems from the problem of length and weight and specific weight. The craftsman reported by THOMEE made strings of different metals but with the same diameters. The craftsman described by HACHETTE worked according to the old principles with length and weight. If the starting length and weight of brass and iron rods are the same, the iron wire drawn from these rods is thicker than the brass wire. As we see, the first wire drawer tackles the problem in our modern way (diameter is important !), whereas the second rests with the traditional way. It would need more research to find out how, where and why this change came about. Did it influence the art of musical instruments making or vice versa ?

THE TWO NUREMBERG GAUGE SYSTEMS

In conclusion we shall consider the difference in numbering encountered by THOMEE/HACHETTE/COULOMB on the one hand and KARMARSCH on the other. Since both way fit the Nuremberg scale we are led to assumption that there could have been two distinctly different ways of numbering.

Figure 9 shows the certificate of birth of a gauge system which originated in 1793 and which we shall call the **New Nuremberg gauge system (N.N. system)**. At that time Jacob Reinhard ERHARD (22) found the traditional solution inappropriate and proposed instead a solution which fits our modern mind. It amounts to the way of numbering described by KARMARSCH. Here, in contrast to the method which we shall call the **Ancient Nuremberg gauge system (N.A. system)**, the gauge numbers are spaced very regularly on the Nuremberg diameter

scale. ERHARD thus did not change the diameters. All he did was to use every second value of the strings diameters (more exactly of the length...) fabricated in his city.

This "new invention", as ERHARD himself called it, did not displace the N.A. system. As THOMMEE's gauge system shows, it was used well into the 19th century.

The hour of birth of the N.N. system and the survival of the N.A. system can be seen on historical instruments. It just cannot be by chance that among those instruments studied by Friedemann HELLOWIG (23) only those built after 1793 show half numbers on their wrestplank or nut.

Both gauge systems have been used by the instruments makers of the 19th century. What made them choose the one or the other remains in the dark.

We need, of course, not mention that the N.A. system had been used by almost all instruments makers before the middle of the 18th century. Nuremberg was the world center of music wire for centuries. The excerpt from the laudation (24) of 1676 permits the inference that Nuremberg string diameters will be found on historical instruments in the north, the west and south of Europe. Considering the cities world wide trade relations and the history of its trade, this is to be expected:

"Als in Holland, Dennemark, Norwegen,
In Saxon, Böheim, Gothen, Schweden,
In Maylandt, Frankreich un Burgundt,
In maijsen, Ungarn, Poln is kundt.
In Teutschen un welchen Land freij
Neapolis auch in der Türkeij".

This confirms the conclusion that Nuremberg held a monopoly instead of several national gauge systems being important. This lets us see the work of Grant O'BRIEN in a new light (25). He starts with the hypothesis that, as a German instrument builder would have used a German gauge system, an Italian, French or English craftsman would have used his own national gauge system, and calculates a table of values. To get this data he takes the most extreme diameter values measured on strings found on historical instruments. By extracting the root - a method not suitable for the old gauge system, as we know now, the numbers are not evenly disposed on the diameter scale - he wants to find the exact values of each of the national gauge systems. On closer inspection all values used in the table fit remarkably well the Nuremberg scale. Is it only chance ?:

III. Neue Erfindung.

Die künertgrächliche Art, Saiten für Klavien, Fagottien etc. zu verfertigen. Es war ich langzeit, für 8 und mehrere Saiteninstrumenten die nämliche Saiten zu verfertigen. Da, weil man auf das Verhältniß der Saiten mit Tönen wenig Rücksicht nahm, bey einem starken Saiten einen geringen, und bey einem geringen einen unangenehmen Klang von sich geben wolte. — und die Unbequemlichkeit der mit Schwere beschriebenen Instrumenten, hat mich zu dem Entschluß gebracht, beiden Mängeln abzuhelfen. In dieser Absicht habe ich durch viele Versuche diejenige Saiten aus, welche bey den Tönen, für die sie bestimmet sind, den besten Klang geben. Ein Baum für ein Instrument, von 2 Octaven beträgt aus 24 Bollen, von denen jede mit dem in der Tabelle üblichen musikalischen Zeichen bemerkt ist. die Saiten sind für die höhere Octaven aus Stahl und für die niedrigeren aus Stahlgang von dem besten Gehalt verfertigt. Ueberhauptemal sind die Construction und ganz mäßige Stänge müssen besonders beachtet werden. Der Preis eines ganzen Baums von 24 Bollen ist 10 1/2 7/8 oder 1 gr. Gold. Die Befehlungen an ihnen will, besteht sich entweder an nich, oder an drei klängen. Handgriffe zu werden. Stahl, und Gold erweise ich geillert. Nürnberg den 17 Aug 1791.
Jakob Reinhard Erhard.

English gauge system : 703 - 204
 French gauge system : 680 - 187
 German gauge system : 643 - 206
 Italian gauge system : 593 - 212

Here we would like to draw attention to the fact that the calculations in themselves may be right. In the history of science and technology they do have to be confirmed by reliable historical sources, though.

We do not intend to imply that there has been only the Nuremberg gauge system. There was a Vienna gauge system, a Berlin gauge system and probably one or another we do not yet know about. But the Nuremberg gauge system was spread all over Europe. As we see, the different historical gauge systems cannot be classified according to national schools, like harpsichord building or the art of painting. Rather they will have to be categorized and named according to the place where the strings were made (and not where they were found).

CONCLUSION

This communication acquaints us with a method which is no longer in use : the wire is not made with the use of a micrometer, instead, for a given weight of wire, a prescribed length must be reached. To reach precisely this length a Zängelmass was used. A precision not thought to be attainable in early times could be reached in this way and, as our summary table illustrates, has indeed be accomplished. It took going back to a way of thinking completely different from ours in order to find the two historical Nuremberg gauge systems : the N.A. system and the N.N. system (as we call them). The latter came into use in 1793. These two gauge systems coexisted until well into the 19th century.

Of course, we cannot claim to have exhausted this field of research... ! Many further vistas are to be opened up. The path which may lead us there consists of the art of posing **questions** in a way that people living at a given time would have asked them. Without it, correct **answers** will never appear.

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