FOMRHI Quarterly

BULLETIN 33
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FELLOWSHIP OF MAKERS AND RESEARCHERS OF HISTORICAL INSTRUMENTS

Hon. Sec. J. Montagu, c/o Faculty of Music, St. Aldate’s, Oxford OX1 1DB, U.K.
At the beginning of the last Bulletin I said that the timing was better than sometimes. Well, er, ... What happened was that we got caught up in the printer's summer holiday. So that's why it was even later than usual. Let's hope for better luck this time.

SUBSCRIPTION RENEWALS: These are now due and I'm afraid that this time the rate has to go up. We've held it at £4.50 & £6.00 since 1980, and four years of inflation isn't bad going. In fact, it's not even our fault that the rate has to go up, but the Post Office's. Postal charges have roared up, year after year (despite the thumping profit they say they make), especially for overseas mail. Even now we are not going to charge the full rate; it costs us £8.35 to send by air mail to Australia, New Zealand and Japan, but we reckon that the rest of us can subsidise that by a few pence rather than charging all overseas members so much. How long we'll be able to hold the new rate depends on what the Post Office does next spring; they never warn us and it just comes as a horrible shock each time.

The new rates are: £5.50 for UK and those content with the vagaries of surface mail. The air mail rates have gone up by so much more than the internal and surface that there now has to be a differential of £2.50, making a total of £8.00 for air mail to anywhere.

There has been some misunderstanding about the two rates. Dave Way felt, and some others agreed with him, that we were discriminating against overseas members by making them pay more. Perhaps it would make more sense if I said that membership in FoMRHI costs £5.00 but that we have to get FoMRHI to you, so we charge postal costs of 50p for those who get it by surface mail and £3.00 for those who get it by air mail. You all pay the same for membership, wherever you live, but it's certainly not fair to charge local members and those who don't mind waiting enough to cover air mail costs abroad. So any of you who think that you are being discriminated against, please break the figures down in your mind: £5 to belong + 50p or £3 (whichever you choose) for postage. In fact, I'll make an offer: any of you who agree to go and collect your copy from Margaret (of course you will have to ring her and ask if it's arrived) can renew for £5 (and I hope she doesn't throw something at me for doing this).

Please send your renewals to Margaret Crowe, 2 Well Lane, Enmore Green, Shaftesbury, Dorset SP7 8LP.

We have a GIRO Account number now: 27 316 4406. Payments should be made out to FoMRHI (or The Fellowship etc) but they must be sent to Margaret; if not, they do trickle through in the end but we don't know who they are from and so you won't get your FoMRHI.

We have to ask for £1.00 additional charge for those who pay in their own currencies (we can take your personal cheques if your country allows you to send them out in your own currency; it costs us that £1 to convert into ours). Especially we have to ask for that £1 if you pay by Eurocheque. These, which are supposed to make international payments easier, cost more than anything else to clear through. As I warned you in Bull.31, we also have to ask £1 if your signature is illegible (presumably only if your name isn't printed on the cheque), as that's what the wretched bank charges us. The same if you put the wrong year for the date; the whole thing is getting worse and worse. And if you fail to sign it.... The trouble is that they charge us, and if they charge us that's a few pages less Q that we can afford.
I've had several queries recently about page size for Comms. Djilda gives the desired size in mm, but presumably those who've asked don't measure a page with a ruler any more than I do. The quick answer to those who can get it is use A4 paper and leave a reasonable margin all round; remember that unless you've typed it in, Djilda has to have room to write FoMRHI Comm. xxx at the top. The reason for giving the size in mm is that not everyone has A4; American paper, for instance, is wider but shorter as a rule (legal size is longer), so they need to allow more margin at the sides but can run down nearer the bottom than I can. We're not specially fussy, so long as it fits a page of A4.

One thing that she and I need to remind you more often is to type single space; double space wastes too much space. The trouble is that it's so automatic to type double space for articles, because that makes it easier for the compositer to read it when he's setting it in type, that you forget that we have no compositer; what you type, Beeprint photograph and print.

Incidentally, a number of people have said keep FoMRHIQ as it is, and I hope that we will.

FURTHER TO: Bull.32 p.6: I suggested that unemployed people should be encouraged to make instruments. David Crookes wonders "how many of us would be willing to take the initiative, approach a local WEA (Workers' Educational Association), polytechnic, university extramural department or technical college and offer to start a weekly instrument-making course aimed at the unemployed? It would help some pretty miserable people get away from forced idleness and mind-destroying TV". So what about it? Would some of you? The only way I've ever seen to thank those who helped me and taught me is to pass it on; what about you?

Comm.468: Laurence Picken wrote to say that perhaps I forgot the X-radiographs of two sizes of what I called the Pontic Lira in Plate 27, facing p.504, in his Folk Musical Instruments of Turkey (as always, he puts my dereliction very kindly). He goes on: "Using the scale on pl.26 and the photographs of the corresponding instruments, I calculate the minimal thickness of the bottom to be ca. 5mm in both instruments... The sides are evidently of about the same thickness. The belly is very definitely bent to give it the bombe shape - the makers even use the term as a Turkish word: Bombe. Remember that the fiddle extends into the Caucasus, and that it only reached the Greek Islands when the Turks drove 'Greeks' from the Eastern Black Sea coastal towns. It is more Lâz than 'Greek'."

David Crookes had a couple of comments on the same Comm. One that he has learned a lot from traditional makers such as a local lambeg drum maker; "People that simply do a job they love can sometimes teach us far more than highly articulate antiquaries. Maybe they don't romanticize as much as we do, but I think they do more work."

The other on rebecs: "Haven't we done a cover-up job on the rebec? The present viols-for everything mania has pushed it out of sight. Can we deduce from the paucity of museum specimens that it was used more than the viol (since we know that the more used and useful instruments were played till they fell apart)? Years ago I made a set of rebecs (including a 4-string bass tuned D A e b) to see if they could be used for more than the rough peasant dances that the textbooks allow. I was able to use them for everything - including the consort music of Byrd, Ferrabosco, Tomkins, etc without any bother. To those who say, 'what does that capacity prove in the absence of evidence?' I reply 'that capacity is evidence'".
Comm. 470: Edgar Hunt writes:

Moisture Blocking of Fipple Flutes

It was kind of Carl Willetts to ascribe to me the idea of using a liquid detergent to obviate moisture blocking the windway of a recorder; but let's put the record straight. In 'The American Recorder' Vol. II, No. 4 (Fall 1961) there was letter from Peter Ballinger, San Rafael, Calif., suggesting the use of Duponol AM (lauryl ammonium sulphate) diluted by about one fifth. At about the same time (in August 1962) Dr R.B. Coles of Northampton had some sample aerosols of a silicon solution made up in various strengths for the same purpose. I tested these and found them effective, but it was disappointing that the idea was not taken up commercially. The aerosol squirted down the windway seemed to be more hygienic than the use of a feather as an applicator as suggested in Peter Ballinger's letter.

I was first aware of the problem in about 1931 when playing my Bressan treble (now in the Bate collection) owing to its very narrow windway. This led me to the opinion that the instrument needed to be gently warmed before playing, and that it should be played with sufficient firmness for any moisture to be blown through and not allowed to accumulate, consistent amateurish under-blowing being 'fatal'. Also, amateur recorder players, like beginning pipe smokers, tend to blow 'wet'. Although I have given up smoking I am not much troubled with surplus saliva which is part of the problem. I have used and recommended stergene for both wood and plastic recorders.

P.S. I believe silicon is used in the water-proofing of raincoats, to encourage water to run off rather than soak into the material. E.H.

Comm. 471: Rod Jenkins:

I've enjoyed reading the correspondence concerning screws (for bows) and although it is not really relevant I feel I must pick up a point that Geoff Mather made in Comm 471 concerning softer materials reducing cutting tool life and using the softer grindstones to sharpen the hardest cutting tools. In general I believe that both these statements are erroneous. The efficiency of a cutting tool may be impaired by cutting a soft material like aluminium because the swarf accumulates and adheres to the cutting tip, but if this is cleaned off the tool will be no less sharp. As regards grindstones I assume that Geoff is referring to the "soft" green grit stones used for sharpening tungsten carbide tools. These stones are made from silicon carbide grit set in a softer than normal binder, the point being that the tungsten carbide quickly dulls the cutting edge of the grit particles but the binder wears quickly to expose fresh sharp grit at a higher rate than with normal grindstones. I must agree with Geoff though over the use of hand chasers, after all the reason why the British Standard Brass Thread is 26tpi for all diameters is that the scientific instrument makers and the like who used it only had (or wanted) the one chaser in the workshop and certainly didn't want to bother with a separate die for each diameter, especially as they tended to make things "to fit" rather than to a specific size. Anyway, why does Eph's screw have to be "stiff and strong", brass or soft iron would have more than adequate tensile strength and being encased in a wooden tube in use wouldn't have anywhere to bend to. The screw in a bow is always in tension so there shouldn't be any tendency for it to bend.
Comm.472: Marcel Glover makes the point "We often perform in costume but not because it makes the performance authentic. It is very popular with audiences and if it gets a second booking then it is worth the effort. Without bookings...."

Comm.473: Marcel made several further comments on his triangle. The size, like mine, was determined by the length of the bar he could get (he was better off than me though; the only sizes of silver steel that I've ever been able to get were all in the standard 13 inch length). He says also "I feel that the original instruments must have had a gap for the following reasons. A closed loop of metal will, because of its stiffness relative to its mass, ring with very high pitch (if at all) and very low volume. This is an inevitable function of the mechanics of the system. From the experiments I carried out with rings of various weights it was obvious that rings damp out the vibration of the frame. On a closed frame they would damp out what little vibration there is and I doubt that they would add much of a tinkle. I suppose it is possible that this is the authentic sound, more like a miniature Jingling Johnnie than the triangle we know today. If one accepts that the rings are there to sustain the frame must have a gap."

JM replies: When there is a gap (as on the unauthentic triangle I use) the rings do not damp out the vibration; they seem to increase it, just as the brays do on a harp and on other instruments, though as with the other instruments the increase is in the form of a jingle rather than of the ring. So far as the closed frame is concerned, the stirrup that I mentioned (a plain band of steel, rectangular in section and trapezoidal in plan) rang better than most triangles of the usual modern form. Maybe it ain't possible, but it happened. What I haven't done, is asked the Kunsthistorisches Museum in Vienna whether I can clout their triangle (see Baines European & American Musical Instruments, Batsford, 1966, fig.824) and see what happens. One day, maybe.

Comm.483: Jørn Steinberg says that having read Paul Gretton's review of Overton's Der Zink, he felt that he should write a very similar review of Peter Paffgen's Laute und Lautenspiel in der ersten Hälfte des 16. Jahrhunderts, just to warn fellow members not to buy it. I had to tell him not to do so because we have not been sent a review copy, and therefore to review a book in those sort of terms might result in our being sued for libel. We were invited to review Overton's book, and therefore he and his publishers have to accept any fair comment, but we have not been invited to review Paffgen's book, and therefore we would not be free to make those sort of comments. You may have noticed that the only books I mention in Book News are those that I can praise (which no author or publisher is likely to object to); the same reason applies, and English law is such that we cannot use Book News to warn you off books; we can only do that when we are sent them for review.

COURSES ETC: The next Bate Weekend is very close (I hope that you'll get this in time): November 5th/6th. The subject is Bassoons, the players are Bill Waterhouse and Felix Warnock and the maker/measurer/reed maker is Mary Kirkpatrick. Format as usual: Saturday morning and afternoon, coaching and playing with Bill and Felix; Saturday evening and Sunday morning, measuring and making with Mary; Sunday afternoon and evening, rehearsal and concert (in Holywell Music Room; the rest is in the Music Faculty in the Bate Collection) at 2.30 & 8.00, with Elisabeth Ritchie (harpischord); Bill and Felix will be joined by Frances Eustace and Mary Kirkpatrick for some Corrette for four bassoons. Sorry notice is so short, but it has all been arranged since the last Q went to print.
I'm hoping to arrange a Lute Weekend in the New Year (perhaps Feb. 4th/5th); Nigel North is free that weekend, and would be the player; I'm trying to get in touch with a maker, and if I succeed I'll add the information at the end of this Bull.

UKIC: The United Kingdom Institute for Conservation has arranged a Christmas Symposium at the V & A on Thursday 15th December. The idea is to talk about conservation of musical instruments, and the symposium is specially addressed to museum people. The odd thing is that, as you can see from the cast list on the programme on the right here, they don't seem to have asked any of the leading conservation people in the musical instrument world. It looks suspiciously as though they've only heard of keyboards, even though the V&A have got strings, woodwind and brass in their collection (and tucked away in packing cases a good deal of very important non-European instruments, especially the contents of the old India Museum). If any of you who are working on conservation have the time to attend this meeting, I think that it could be important to do so, not because you are likely to benefit, but to show the V&A and the UKIC that there is some work going on in this subject and that there are people around who know something about it. In other words, we ought to show the flag. It costs £15 for UKIC members and £18 for non-members, which is a lot, but this does include coffee, lunch with wine, and tea. I have some forms (and will have them at the Horticultural Hall in November) but otherwise the person to write to is: Miss Christina Huntley, Early Musical Instruments, Department of Conservation, Victoria & Albert Museum, London SW7 2RL, with a cheque made out to: UKIC/V&A Symposium, and before 24th November. The form asks for Name, Job title, and address; tickets will be sent by 1st December, and they will send an invoice if you need one (but in that case send them an S.A.E.).

ANSWERS TO QUERIES: Brian Lemin sent me copies of a couple of replies he's had (and for which he is very grateful); unfortunately he sent them double spaced, so I've got to retype them. The first is from John Paul: "Re your query in FoMRHI 30, I can give you details of how I do my nameboard writing, which may be of use to you. I also paint in oil on wood. Pens: you might try quill. I use Indian ink and do it with a '0' sable brush and would recommend this. You will find a picture of one of my nameboards in my book 'Modern Vernacular Makers'.
I French polish my work, leaving it thus, or using it as a base for wax finishing and the preparation is as follows: I rub down to a perfect surface (nameboards are always satinwood veneered) and seal using a weak solution of urea formaldehyde glue rubbed in. Watered down hardener (50/50) is then swabbed over, all superfluous liquid wiped off, and left to harden to dry for 24 hours. Where paint or ink is to go on, I then swab over with a solution of bicarbonate of soda (1 teasp. to 1 cup water) to kill any remaining acid and leave 24 hours, (where u-f glue is used in an instrument, it is a good idea to kill remaining acid like this anyway, as the fumes persist for ages and damage brass wire). Rub down with 0 or 00 glasspaper and French polish. I use a table top polish called H.L. which is vastly superior to ordinary polish giving a hard, thin, satin finish. It is put on with the grain only, and without oil. When the polished surface is perfect and hard it is cut back to the wood and the ink and paintwork can be put on. When these are fully dry, the final pull over of polish can be made. Polish can pull up Indian ink, so what I do is to take the pad once over the work and allow to dry. Do again repeatedly as necessary until there is enough hard polish over the ink to seal it and then polishing can proceed normally. I have used exactly the same technique for soundboards. In my book there is a picture of an upright harpsichord with painted decoration on the soundboard done this way, You may find this book useful: Handbook of Decorative Design and Ornament by M.J. Alexander, Tudor Pub.Co., New York, 1965."

The second is from Colin Everett: "I am only fair to average at lute rose cutting but I do know some of the problem areas. Thin the soundboard to around 1mm in the rose area so that the cutting is easier (less wood to cut). 2) Use a surgeon's scalpel with replaceable blades. Try to sharpen them with a very fine stone as they blunt. If unsuccessful, just use another. 3) Use a xerox copy of the rose pasted to the thinned soundboard as your cutting pattern. 4) I cut from the outside surface with a hardwood backing behind the spruce. 5) Do a rough cut through the xerox copy to remove wood where necessary. Scrape off the xerox copy and then impregnate the wood of the rose area with 50/50 glue/water to reduce its tendency to break. Apply glue to both sides and dry it quickly over a warm air stream to avoid too much distortion of the wood. 6) If you shatter small pieces of wood, glue them back in. 7) Now (when dry) do your fine cutting until rosette is acceptable to you. Sand both top and bottom of belly to clean up (220 grade). Recut rosette and then do the 3-dimensional work (interweaving). I spend a total time of about 8 hours per rosette, with breaks in between to allow broken pieces to harden back into place."

I'm grateful to Brian for sending these, but could anyone else who follows his example please send them single-spaced?

Rod Jenkins sent the following:

In April John Paul requested information on cheap tuners. I've had a Seiko TOLV ST369 quartz music tuner for about 18 months. It cost about £60 when I purchased it and I've nothing but praise for it. The required pitch is controlled by two knobs, one for the semitone and one for the octave. In its "talking" mode the machine generates equally tempered chromatic scales from C2 (65.41 Hz) to B7 (3951.1 Hz) and plays them through the built in loud speaker. There is also a jackplug output and by connecting this to the auxiliary input of an 8 Watt amplifier I was able to generate tones with considerably more volume than is necessary to do some Chladni tuning tests on a viola's front and back plates. The machine also has a "listening" mode. There are both a built in
microphone and a socket to accept a standard 1/4" jack plug from an external microphone. The tuning meter is calibrated from -50 cents to +50 cents about an equally tempered interval. It is therefore possible to tune any temperament providing the deviation in cents from the equally tempered interval is known. When I first bought the machine I checked the accuracy with an oscilloscope, digital frequency meter and signal generator in both working modes and it lived up to its claimed accuracy of less than + or - 1 cent. On top of the machine is a button to shift the calibration of A440 to A445 in Hertz steps for which I have no use. There is also a socket for an input of 9v DC but an alkaline battery seems to last indefinately if you don't forget and leave it switched on in the listening mode. I bought the Seiko originally for tuning my virginalis (when I eventually get around to making it) but have found that it has more than paid for itself in relieving frustration in tuning my lute in 5 minutes instead of half an hour.

I sent John a copy and he has asked me to ask you whether any of you can supply an opinion on the Arion Micon tuner. I've not come across that one, so it would be interesting to have a copy here for others.

WARMING WOOD: Rod also sent this note:

Having acquired a hot air paint stripper for stripping paint, I've found it extremely useful in the workshop. It's great for warming up timber prior to gluing with animal glue and very good for taking joints apart again. I've also found it good for glueing bellies and backs onto instruments with a minimum of cramps. Just spread warm glue onto the ribs and the plate and put the two together with a few cramps at regular intervals round the instrument. Taking about 9 inches of glue line at a time the glue line can be re-vitalised by warming it with a hot air blast and cramping it. The glue can then be left to go cold before moving on.

I've also found the same tool useful. All the Bate instruments are held by metal brackets. The metal is covered with shrink-tube (a plastic tubing that shrinks with heat; it comes from electronic suppliers) which avoids wood or brass on metal. I used a paint-stripper to heat it. One could probably also use it to bend perspex. It was Bob Barclay who tipped me off to shrink-tube and he and Cary who suggested the paint-stripper.

ACID-STAINING: Andrew Willoughby sent this comment on Comm.474 (it arrived today, after I'd done the Further To's):

"Acid Staining of Hardwoods" - Carl Willetts.
1. Carl recommends -

"swabbing the instrument as fast as possible (with acid) - commensurate with safety. At most take one minute over t is stage." !! (My underlinings)

That sounds a bit dangerously hurried to me. Surely it is better to work a slower and more carefully. The most important things for safety are to wear protective gloves, goggles and coat, and not to splash the acid nor to inhale the fumes.

Also, one of the advantages with acid staining is that you always get a good even stain alove the wood, there is no need to apply it as quick as possible.

2. Carl recommends, in the same Comm., "dousing the instrument in running water to Wash away all external traces of acid."

Several of us students at the London College of Furniture prefer not to do this because it raises the grain and leaves it rough,dampend the wood unnecessarily, and doesn't help to neutralise the acid or stop it fuming.

We prefer just to leave the instrument exposed in circulating sir, or to swap it with linseed oil a couple of times and then leave it.
Historical references:

Plumier "L'Art de tourner en Perfection" 1749 (2nd, Ed.) (Quoted by David E. Owen in Forme Comm.; 131 - . . )

"You take some hard wood such as walnut, lime, box, maple or others such as which you put into Nitric Acid; then expose the wood to the sun or to some coal distanace, or to the sun, and leave it exposed until it no longer fumes. After that you polish it.

Nor does Bergeron, "Manuel du Tourner" (2nd, Ed.) 1749 recommend doubling it, or also quoted in David E. Owen's Comm. 131.

David Owen himself, though, does suggest that "staining can be arrested by plunging into a large volume of water at the appropriate stage to dilute and wash away the acid."

In Forme Bulletin 12 p.5, Bob Marvin writes: "when the colour has taken (a few minutes); flood with boiling water, wipe off," etc.

Donald S. Gill has suggested another substitute: "I can recommend from personal experience Dylon Old Gold (no.28) cloth dye. About enough to cover a fingernail in a quarter of a tobacco tin full of water. (how's that for scientific accuracy?). It certainly works well on sycamore but I haven't tried it on other woods."

MATERIALS: Mike Joyce sent me a couple of pages from the July 1983 Guitar Magazine which has a list of alternative tone woods by Dr. Eugen Follmann "an expert in acoustical engineering. Dr.Follmann heads a company in Brazil specialising in components for musical instruments!". It's interesting because it gives alternatives for some of the woods which seem to be dying out. The magazine is presumably London-based.

Malcolm Rose has sent the following note about keyboard wire:

ENGLISH IRON AND BRASS: harpsichord and fortepiano wire made by Malcolm Rose and Derek Slater.

It's nearly two years since we began supplying wires to other workshops on a regular basis, and members may be interested to have up to date information. The following is a copy of the notes we send for general guidance:

We are very pleased to be able to tell you that we are producing iron and brass wire in the Mayfield workshop. These wires, now in use by makers and restorers throughout the world, come as the culmination of six years' research into the wires used in Europe from the late 17th to the mid 19th centuries, and give an extremely close match in their metallurgical, mechanical and acoustic characteristics.

We recommend English Iron for use on harpsichords with a scaling of up to 37cm (14½") for c' at a pitch of A415 Hz, and up to 35 cm (13½") at a pitch of A440 Hz. The larger iron diameters are ideal for typical forte-piano and square piano scalings.

English Brass is a ductile 70/30 brass of the correct microstructure. The smaller diameters are for brass-scaled instruments up to 30cm (11¾") for c' at A415, and up to 29cm (11¾") at A440. The intermediate diameters are used for the lower octaves of iron-scaled instruments, while the larger diameters are intended for work with all types of early pianos.
Red Brass is a 90/10 brass to match the usual 18th century specification. It will give the best possible focus to the sound in the bass, being normally used up to D in 8' registers and up to C in the 4', where yellow brass is under-stressed. Red brass is also found in some types of early pianos.

All these wires are by nature relatively ductile, and liable to damage by excessive twisting while winding loops. Care should be taken not to exceed four turns on a two-metre length of wire which is being held for winding. The wires also need time to develop to their full sound; after the wire has stabilized its pitch, please allow the iron three weeks, the yellow brass four weeks and the red brass six weeks before judging the success of the stringing.

If you are placing your first order, 50m of each diameter will give you ample to string a three-register harpsichord or a fortepiano. Please keep empty reels until you have a chance to return them.

Diameters supplied in mm:

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I told Malcolm that I'd been tipped off to some wire gauges (17th, maybe 18th, and 19th century) in the Museum of the History of Science here. I will write them up (though not in this issue) unless any body else within reach of Oxford has anything better to measure them with than the feeler-gauges I've got (in .05mm steps). Feeler gauges are not a very accurate way of doing it, but I haven't got anything else that'll go down the slots. Two of them are certainly musical; one is a violin gauge (late 19th c I'd guess); the other might be
for harp as it changes gauge for every note.

TOOLS AVAILABLE: Huw Saunders has "a large heavy sawbench cluttering up my front room which I would like to sell to a FoMRHI member, quite cheaply (it needs a new motor). Preferably one who would be willing to let me use it very occasionally and therefore living in the London area. I'm willing to haggle!" His address is in the List of Members.

QUERIES: Brian Lemin still has some rose-cutting problems and asks whether anyone could do a Comm on rose cutting using chisel/punches, which he's heard of as a method. He'd also like to know of a set-up for drilling holes in jacks for bristle springs. Also any hints on construction of jack guides/rails and aligning them with keys. He's constructing a spinet. His address is in the List.

From a new member:

A REQUEST FOR INFORMATION ON RECORDER VOICING

I am writing a dissertation on Recorder Voicing, and would like to hear everybody's ideas about it. I am writing individually to all FoMRHI members who list themselves as recorder makers (so be warned) requesting their help and a little of their time in answering a few questions.

But I would also be very gratefully for anybody else's knowledge or ideas on the Art of Recorder Voicing. All replies will be included in the Dissertation and acknowledged (and presented for my Higher Diploma in Musical Instrument Technology). But it will also be available for all present and future students of Early Woodwind at the London College of Furniture, and anybody else. Also, maybe a synthesis of all the knowledge I gather could be a Comm. in FoMRHI, or published elsewhere.

The sort of answers I am looking for are to questions like - What (to your knowledge) is the effect of the top and bottom chamfers, the length, height and width of the windway, window and labium, arching the windway roof and putting a dip in the windway floor? Also, how to give a recorder 'edge', and a 'good tone'. And what is the difference, in sound and voicing details, between Renaissance and Baroque instruments etc etc.

Hopefully, the Dissertation will gather together a lot of knowledge on the present state of the art. I would be very grateful for all snippets of information. It would be available to whoever wants it.

Andrew A. Willoughby
9 Galsworthy House, Carr Street,
London E14 7RU

EXHIBITIONS: The Horticultural Hall Sixth Exhibition of Early Musical Instruments, of course. Dates (as you probably know) are 18th-20th November, including a Sunday for the first time, which should help a lot of people who can't take time off work. Times are 10-8.30 on the Friday and Saturday and 10-6 on the Sunday. I shall be there and as well as my own books (which any of you are interested have probably got already) and FoMRHIQs I shall also have Bate Catalogues, including the Supplement which is the preliminary check-list of the Edgar Hunt Accession, and also the check-list of the Retford Bow-making tool display (they cost the vast sum of 20p each; if you want copies and can't get to the Exhibition, write for them; I'd be grateful if you'd add the cost of a stamp to wherever you live at the lowest rate; they're each one sheet with 4pp on it); there's also a general sheet on the Collection at 10p. The Catalogue (by Tony Baines in 1975, so there's some things that aren't in it) costs £2.50.

You will also be able to pay your 1984 subscriptions there, if that's easier than sending them to Margaret. Try to remember to bring the enclosed 'INVOICE' sheet with you to avoid muddles.
UTRECHT: Rod Cameron has sent me (and I imagine many of his friends) a long note about his visit to the Utrecht Festival last month. It's too long to quote here, and I don't think it's suitable for a Comm, but it was obviously a very successful occasion, with a lot of playing and a good display of makers (mixed in with antiques, meat, poultry and fish).

OTHER SOCIETIES: I've had a note from the Lowland & Border Pipers' Society. Their aims are to promote interest in the instruments through publications, broadcasts, recordings, exhibitions, etc, to promote the playing of the instruments, to study the music and to revive the making of the Lowland & Border bagpipes and the Scottish Small pipes. They are also trying to put together as complete a list as possible of makers and their instruments. They have a questionnaire and they charge £15 for membership. If you're interested, write to Mike Rowan, Mains Castle, East Kilbride or ring him on 041-424 0988 (days) or East Kilbride 47727 (evenings).

That's it for the moment, while I do the rest. Meanwhile,

DATES: Nov.5th/6th - Bate Collection Weekend - Bassoons
Nov.18-20 - Horticultural Hall Exhibition
Jan.3rd - Deadline for next Q.

If you've not renewed by then, you won't get it, though, so please remember to send your renewals in (Do It Now, as they say) or bring them to the Horticultural Hall. Send some comments for the Bull with them, or a Comm, or both. This Q looks like being a good one, judging by what I've got here, and please keep up the good work.

LIST OF MEMBERS: I meant to say that we have a new member who has only given her name as Mrs. Sneddon. As you must have noticed, I don't put any titles or styles in the List. One reason for not giving Mr, Mrs and Miss is that with a number of you I don't know whether you're male or female, since I don't know the name range in your language; another is that I don't know whether the ladies are married or not (but I do know that none of them are manuscripts, which reminds me that Margaret Crowe is Mrs if you want to be formal; she is quite happy being Margaret, but if you address her as a manuscript she's quite capable of throwing your renewal away unopened). Also many of our members are Dr, Prof, or whatever, but not everybody says so. So I keep everyone the same, and I prefer first names or names to initials because we're an informal lot, like most musicians and makers, and tend to address each other by our first names. If a Fellowship isn't a group of friends and colleagues, what is it?

Comments on Comm. 468 Peter Berg
Fiddle boxes carved from the block

Anyone who wishes to see how a box body can be carved from a solid block need look no farther than Sweden (or my workshop in London!), where keyed fiddles (nyckelharpor) of the Silverbas or Kontrabas type are made by this method. Starting from a half pine log having very close growth rings, wall thickness down to 3mm can be achieved, with the bottom usually around 4mm. If the work is done quickly and the body kept in a plastic bag overnight, splitting can generally be avoided - some makers even work with green wood kept wet while the carving proceeds. The result is not only carved from the block, but waisted and flat backed as well!

Just room for this one late arrival and that's the lot.
BULLETIN SUPPLEMENT Djilda Segerman.

BATE WEEKEND — further to p.6. The Bate Collection Lute Weekend is now confirmed for 4th/5th February. Nigel North will be demonstrating and coaching on 17th and 18th century baroque lutes of all sizes and perhaps on the vihuela. Michael Lowe will run the historical specification, plans and making sessions on the Saturday evening and Sunday morning.

WANTED “someone ... to make ... a reamer and some drills at a decent price” Paul Kemner.

LATE CONTRIBUTION — sadly too late to be printed in full in this very full Q. — a comm. (?) from Sverre Knollberg (?), the unprecedented perspicacity of which we have not hitherto seen. Or at least so it seemed upon reading it over breakfast this morning. Here follows as much as there is room for.

I have developed a sound colour harmonical and soundwave-morphological procedure of Recorder analysis and construction.

John Downing

While taking a closer look at the guitars in the Ashmoleum Museum Oxford a couple of years ago I noticed a painting by Sebastiano Lazzari of a 5 course Spanish guitar. The following description of the guitar may be of interest:—

Five double courses with octave stringing on the bottom two courses, octave strings below the bourdons. Strings tied to the bridge and to the pegs in the following configuration:—

Fingerboard carries ten tied frets to the body. Fingerboard terminates in "stings". Flat, plain sided peg box with ten pegs inserted from the back. Signed on the front of the pegbox "Domenico Sellas" with a crown motif between. Ribs of body built up from four strips of shaded yew with ebony purfling between. Belly relatively thick at the edge of the body (3mm?). Geometrical decorative inlay surround to 3D rose.

Shoulder cord with tassels at each end tied to a hinged metal ring at the tail of the body and through an oval hole cut through the top of the pegbox.

The date 1757 appears in the painting.

* confd. on p. 16
Recorderists seriously concerned with authenticity in performing early music are by now aware that it is unduly simplistic to execute any baroque music at the so-called baroque low pitch (a'=415). In fact this particular pitch was common in the baroque era only in some regions of Germany, whereas it varied considerably in other countries. For instance pitch has always been quite high in Italy, not only during the Renaissance, when it varied between 450 and 468 (see R. Weber: "Some Researches into Pitch in the 16th Century with Particular Reference to the Instruments in the Accademia Filarmonica of Verona", in GSJ XXVIII, 1975, pp. 7-10), but also in the baroque era when it was, at least in North Italy, quite close to modern one. Good evidence of this statement is the pitch of numerous woodwind instruments by Italian baroque makers like J.M. Anciuti or Ignaz (a'=435 about) or that of many untouched Italian baroque organs. It follows that recorderists willing to perform correctly the original Italian baroque repertoire of their instrument (Vivaldi, Marcello, Sammartini, Mancini, Bellinzani, etc.) should utilize a modern pitched recorder instead of a low pitched one, as one often does (see for example Gudrun Heyens in her otherwise excellent record Concerti per Flauto, Archiv Stereo 2533 380), since this involves a notable alteration of the original character and tonal colour of the music itself. Unfortunately most 440-pitched recorders available to-day are rather unsatisfactory for a purist performer, because they are scaled from originally low pitched instruments (Bressan, Denner, Rotterdurch, Oberlender, etc.), hence a subjective and debatable option, and not replicas of original ones. For this reason the rare original Italian baroque recorders, particularly the trebles, acquire a special importance since they could supply modern makers with good patterns in producing 440-pitched authentic baroque instruments. Among them is worth mentioning the treble recorder at the Museum der Stadt Meran, a very peculiar instrument from several points of view. Its existence has been pointed out by Wilhelm Roos (see his article "The Musical Instrument Collection at Meran", in GSJ XXXII, 1979, pp. 13-14), and I could carefully measure and examine this recorder thanks to the exquisite courtesy of the museum director, Mr Wolfgang Duschek. Unfortunately it is not possible to trace the history of this instrument, as the Museum does not possess any documents about its previous owners; the date of acquisition is also uncertain, but it seems to go back to the beginning of our century. The recorder is stamped 'NF' on the headjoint only and this mark, as far as I know, is unique. The shape of its mouldings too is
quite original and recalls that of many Tyrolese bell-towers. This fact could suggest that this treble was made by a local craftsman, but a French painting by Louis Silvestre (1675-1760) in Lindau (reproduced in the Moack Calendarium 1982) shows a recorder which seems to be identical to the Meran one: the instrument in question might therefore be of French origin, and in this case it ought to be considered a g' instrument tuned at the French very low pitch (a'=390), instead of a f' instrument at about a'=440. At present it is not in original conditions, since it has been heavily restored, apparently not by a specialist, perhaps a furniture restorer. Hole dimensions and middle joint bore seem to have mostly suffered, since some notes and octaves are badly out of tune; furthermore the edge is seriously damaged (no attempt has been made to restore it). Nevertheless the recorder still has, at least in the central register, a sweet and charming tone, with a bit of 'spit' on most notes. Owing to the damaged edge, the recorder does not play above a''' and also its lower register is poor, but its original characteristics concerning tone and response had to be undoubtingly quite remarkable. In fact I have made some close replicas of this recorder (only lightly modifying the middle joint bore and the hole sizes to have all notes and octaves perfectly in tune according to meantone temperament) and they have all revealed excellent musical qualities, particularly suited, to my taste, to the Italian baroque recorder repertoire. Finally it is worth observing that the general proportions of this recorder are themselves out of established patterns: the head joint and foot joint lengths correspond closely to those of a low pitched treble, so that the central joint is rather shorter than usual; perhaps the instrument had originally a second, longer middle joint, better proportioned to the head and foot joints, to play at a lower pitch. Of course this is only an hypothesis, but if it were true the Meran 'NF' treble recorder would be in this respect too an unique specimen.

(Kolbem, from p.13)

that might be of fundamental importance to reconstruction of historical woodwind instruments, and maybe also to brass and string instruments.

The principle is that the acoustical forms of recorders are sculptured according to the physical forms of the internal superposed, standing soundwaves, which are traced by a so called flutefish

The woodwork is then performed free-handed with spoon-reamers,
Djilda and Eph Segerman (FoMRHI Comm. no.5(1976)) have discussed the geometrical construction of lute shapes. They take a pure approach which makes minimal use of measuring instruments. They assume that "if the analysis comes out with simple parameters it is highly probable that that is what the maker did." As one of three examples they give the geometrical description of the belly outline of the Maler lute, Nürnberg, Germanisches Nationalmuseum MI 54.

The question is a) whether the makers really constructed the outline of the belly and b) whether they did it in the way described.

Unfortunately, at least to my knowledge, there is only one source available which describes the methods of early lute construction, i.e. the Zwolle manuscript. Zwolle does not give the geometrical description of the belly outline but that of the mould outline. This approach seems more likely as it corresponds to artisans' skills.

Having constructed some dozens of lute outlines in the way described by the Segermans and having additionally repeated the construction of the outline of the same instrument several times, my findings are as follows:

Generating centre points of arcs by intersection of lines and/or arcs and only little use of measuring instruments will very likely lead to a shape which is not symmetrical, and if the construction is repeated, even by the same designer, to shapes which are not identical. This applies to the lower part of the outline (below the maximum width) but even more to the upper part where arcs of a far larger radius are needed for construction. The likelihood of inaccuracies in the design is increased the more centre points are generated by intersection of arcs (an example of this is the depicted and described pearl-shaped lute in the above mentioned Comm.). Inaccuracies become less likely when the centres are generated just by using a T-square, a set-square, and a rule with the measuring system used then. Additionally, this is much easier, too.

In Italy the measuring system before going to metric in 1860 was based upon the "braccio". 1 braccio corresponded to 12 oncie, and 1 oncia to 12 punti. So 1 braccio was equal to 144 punti. The absolute length of 1 braccio differed from city to city and region to region. Even within the same city different standards were used (e.g. Venice: 1 braccio (wool) = 0.663 m / (silk) = 0.639 m).

It seems likely that for instance Laux Maler based the measurements he needed for lute construction on the standards used by the lutemakers of Bologna.

So, when trying to reconstruct the probable original design we first have to give up thinking metric (at least that applies to the continental European) to discover how easily Laux Maler might have constructed the shapes of his lutes. Figure 1 describes how the mould for the construction of the Maler lute MI 54 might have been designed. (I agree with the Segermans, I found this search for the possible original
design "a rather fun game to play - and more constructive than crosswords".) The construction requires only a minimum of parameters. (Concerning the system used for notation see the above mentioned Comm.)

I do not know what standard braccio Laux Maler used. But we do know that 1 braccio of Bologna before they adopted the metric system corresponded to 0.640 m, and we also know that the standard used in Florence at that time (1 braccio = 0.584 m) had not changed for at least the last four centuries. If Maler had used the Bologna standard the conversion of the data in Figure 1 would result in the following description:

\[
\begin{align*}
B'B &= 66 \text{ punti} \\
AB &= 33 \text{ punti} \\
C &= \text{ABR}(115 \frac{1}{2} \text{ punti}) \\
D &= \text{AprAB.C'a'B} \\
E &= \text{AD}(16 \frac{1}{2} \text{ punti}) \\
F &= \text{AAE}(8 \frac{1}{4} \text{ punti}) \\
G &= \text{AB}(16 \frac{1}{2} \text{ punti}) \\
H &= \text{PprPA}(8 \frac{1}{4} \text{ punti}) \\
I &= \text{G'HH.G'aB} \\
J &= \text{EHH.HaI} \\
K &= \text{EAA.EaJ}
\end{align*}
\]

A construction to scale based on these figures and the Bologna standard leads to an outline which is very close to the one needed to give the back the shape it really has. 66 punti for the maximum mould width correspond to 293.3 mm. Adding twice the strength of the ribs (2 x 1.6 mm) and of the endclasp (2 x 1.1 mm) gives 298.7 mm. 296 mm is the actual maximum width of the back/belly. The difference may be due to shrinkage because of age and to inaccuracies which may have occurred during the construction of the design or/and of the mould.

Figure 2 describes the possible design for another Maler lute, the maximum back/belly width of which is 292 mm. 65 punti (Bologna) give 288.8 mm for the maximum mould width. Again, the construction requires only a minimum of parameters.

The following comparison shows that the construction of both designs follows identical ideas. The only differences are the measurements used for generating the arc centres.

All in all it seems possible that Laux Maler constructed the shapes of the moulds for the lutes under investigation in the way described. What the mould shapes really looked like will, I am afraid, always remain uncertain (see the remarks concerning inaccuracies in the construction of the design and/or the mould itself).

I would appreciate it if members with more knowledge of especially Bologna early 16th century lute making practise could provide data on the braccio of Bologna used then. Admittedly there is some guesswork in my findings. But I do hope they will stimulate other researchers to contribute their knowledge especially of this early period of lute making, and, again, the work done was far more fascinating than crosswords.
Figure 2
Shape of Mould for Lute by LAUX MALER
Prague, Narodni Museum No.654/140BE

Assumed symmetric
B'B = the maximum width of the mould = 65 punti
AB = 32 1/2 punti
C = ABB(123 punti)
D = AprAB.C'a'B
E = AD(36 punti)
F = AAE(6 punti)
G = AB(6 punti)
H = FprFA(9 punti)
I = G'HH.G'aB
J = EHH.HaI
K = EAA.EaJ

Shape D(C')B(G')I(H)J(E)K

1) 1 punto = 1/144 braccio
1 braccio = 0.640 m (Bologna)
The search for a substitute for ivory is a recurring problem in the pages of FoMRHIQ. My limited experience suggests that bone was quite widely used in the past and some early 19th century clarinets and flutes I've examined certainly have bone rather than ivory ferrule rings. The main disadvantage of using bone is in the available sizes and it would be impossible to find a large enough piece of bone for the ring around the bell of a clarinet (unless one were to use elephant bone which would rather defeat the object), however I've been well pleased with the results I've obtained using bone for nuts and peg decoration.

The best bone to use is the centre of a thigh bone (femur or humerus) which will yield good solid material (fig 1). The promising looking ball joint at the end consists of a thin skin of solid bone over a beautifully engineered, strong, light weight and quite useless honeycombe. The local butcher should be able to supply suitable marrow bones for a modest sum. When preparing the bone first poke out all the marrow and scrape as much of the adhering tissue as possible from the bone surface. Then boil the bone in heavily salted water for an hour or so. The water should be changed two or three times during this hour since a fatty scum will form on the surface. Any remaining tissue will now be easily removed and the bone should be an opaque chalky white. If the bone remains transluscent then boil it some more or discard the bone as it will turn yellow, due to the remaining fat content.

In cross section the bone is a rounded oblong with two opposite faces that are quite thick joined by two thinner webs (fig 2). I tend to cut the bone so that I have the two thicker pieces and the two webs separated. The thicker pieces are used for making nuts and peg end plugs while the webs are used for making peg decoration rings.
Bone is cut easily with a hacksaw and can be readily shaped with a file. A large bastard file is particularly useful for shaping the sawn pieces into geometry more easily held in a vice. I've never worked ivory but I understand that bone is rather more brittle, but is certainly easier to work than, for instance, Vigoplas. In the lathe bone works quite well with small scraping tools by hand or any old tool shape in the metalworking lathe. Care needs to be taken if using a form tool since there is a tendency for the material to burn.

When making end plugs for pegs first turn one of the thicker pieces of bone down to a cylinder with a diameter equal to the largest diameter of the plug (fig 3). The end is then turned to the diameter of the hole in the end of the peg (fig 4) and the workpiece is parted off to leave a suitable head length (fig 5). When there are enough of these chuck each one by the smaller end (fig 6) and work the larger end to shape with a file on the rotating plug (fig 7). The plug can then be smoothed off with fine production (wet and dry) paper and finished up with metal polish.

To make rings cut the webs into squares of suitable size and flatten them off with a file (fig 8). Drill a hole through the centre of each square equal to the diameter of the peg at the point at which you wish to place the ring to be (fig 9). A mandrel is then turned out of boxwood to this same diameter and the squares are stuck onto the mandrel with shellac (sealing wax) which has been warmed (fig 10). Let the shellac go quite cold before starting work. The squares should be roughly ground into octagons with a file and can then be turned down to their final diameter (fig 11). Each square should make one or two rings depending on thickness. The rings can then be parted to their final thickness (fig 12) and shaped with the parting tool, files and paper and finally polished (fig 13). The rings are removed from the mandrel by warming the shellac.

I stick both the rings and the plugs to the pegs with shellac, which has the advantage of being available from wood finish suppliers in a wide range of colours.

Finally, one word of caution for the faint-hearted; when working bone there is a smell strongly reminiscent of having your teeth drilled at the dentist.
THE FINGERED 16' ON THE HARPSICHORD.

There is still a lot of research to be done, and a lot of discoveries to be made on the subject of keyboard lay-outs. By keyboard lay-out I mean such things as C/E-c"" (meaning a keyboard starting on E and including all the sharps in normal order to c"", and intended to be tuned to the so-called short octave) or as another example, F;G;A - g"",a"", meaning a keyboard from F to a"" with two accidentals omitted in the bass and one in the treble.

In this article I want to draw attention to a particular sort of keyboard lay-out which hints at a certain performance practice, in the hope that performers may be tempted to take the matter up.

The type of keyboard I am thinking of is characterised by having a few extra natural key-levers in the bass usually without the intervening accidentals. The most striking example of this is the early 17th century double harpsichord in the Brussels museum which Koster discussed in GSJ XXXV, p 45. This instrument originally had one keyboard of CC,DD,EE,FF,GG,AA-a"" and the other C/E-d"" sounding a fourth low. (Koster speculates that it could possibly have had a CC/EE short octave for the first keyboard, but the instrument is too wide for such a compass.) Now there are three questions to be asked about this: Firstly why are the notes C-sharp, D-sharp, F-sharp and G-sharp included on one manual when the other manual has a C/E short octave? It would be a minor irritation to have to remember whether one had a short octave or not on the keyboard one was using, so there would have to be a reason for adopting such an arrangement.

Secondly, why arrange six natural notes in a row, with no intervening accidentals? Such a keyboard would be easy to get lost on, even with the note names written on the key-levers. It would make more sense to arrange the keys as a CC/EE short octave as Koster suggests, and save two inches on the width of the instrument. Lastly, why extend the instrument to such a low pitch anyway? Well obviously to play the low notes, but not presumably by the expedient of transposing pieces of music down an octave wholesale; at most one could envisage a short passage being transposed for special effect. Another possibility is that this is a freak instrument of small and now vanished repertoire, but such explanations would leave the second of my three questions unanswered.

The explanation for this type of instrument lies, I suspect, not in a special type of repertoire, but in a special technique used for some parts of the normal repertoire. The idea is to devote the entire left hand to a single bass line, with the thumb playing the written notes and the little finger following the same part but an octave lower, in effect adding a 16'. This technique demands that the chromatic notes C-sharp, E-flat, F-sharp and G-sharp be included so that they can be used by the little finger when the thumb is playing C-sharp, E-flat; F-sharp and G-sharp, it also requires the bass notes to be laid out in their normal sequence, so that the player need only concentrate on what his thumb is doing, and since the thumb does not play the notes C-sharp etc, the notes CC-sharp etc are naturally omitted. The resultant sequence of six natural notes unpunctuated by sharps causes no confusion since they are only touched on by the little finger in following the thumb around.

The early (pre 1550) keyboard layout of F;G;A - g"",a"" should perhaps be considered in this light; as instruments of the time go, this was a large compass, and the Couchet basses (post 1650) of FF, GG, AA would certainly be candidates, as would those large Shudi harpsichords of the 18th century with chromatic keyboards to CC.
1983 FoMRHI List of Members - 2nd Supplement as at 7th October 1983

* in left-hand margin denotes a change of address etc.

Charles Barker, 36 Hollow Lane, Ramsey, Cambs, UK; t: 813830.
Thomas C. Boehm, 100 Morningside Avenue, Madison, WI 53716, USA; t: (608) 221-9390 (bar flutes, recorders; M,P).
Ramón Pinto Comas, Carmen 8, Barcelona 1, Spain; t: 317-61-36 (vln, gtr, pfte, str instrs gen; M,R).
William T. Elliott, 190 Marsden Road, Dundas, NSW 2117, Australia; t: 855663 (bar keybd, wind; M,R,P).
Fritz Heller, 43 Haut Vinave, B-4804 Jalhay, Belgium; t: 087/647547 (bagpipes, reeds; M).
Paul Y. Irvin, 221 Glenview Road, Glenview, IL 60025, USA; t: (312) 998-9829 (hpschd, clavchd; M).
David Wyndham Mayes, 97 Pillebrook Road, Leytonstone, London E11, UK (ww; M).
Paul Reap, HMP Haverigg, Millom, Cumberland, UK.
John Seale, 111 Saul Road, Crumlin, Dublin 12, Eire.
G. M. Simons, Koning Clovisstraat 36, NL-6226 AG Maastricht, Netherlands; t: 043-621802.
Mrs W. E. Sneddon, 73 Wansbeck, Rickleton, Washington, Tyne & Wear NE38 9EG, UK.
Norman Sohl, 832 Glass Ave, Olympia, WA 98506, USA; t: 943-6697 (early ww; M,P).
Mark Narda Spoelstra, Iggelheimer Strasse 15, D-6720 Speyer/Rhein, West Germany; t: (06232) 5 52 20 (ww, str, M; keybdü, R; ww, C).
Charles Stroom (recorder; M).
Gary Sturm, NMAH 4124, Smithsonian Institution, Washington, DC 20560, USA (Conservation).
Wesley F. Wadsworth, 2508 De Koven Avenue, Belmont, CA 94002, USA; t: (415) 593-3705 (vlns, vln bows, M; all str instrs, R).
Donald Warnock, POBox 265, Wilton, NH 03086, USA; t: (603) 654-6628 (lutes, vih, gamba, etc; M).
Andrew Willoughby, 9 Galsworthy House, Carr Street, London E14 7RU, UK (early ww; M).
John M. Wilson, 9 Old Brewery Mews, Hampstead, London NW3 1PZ, UK; t: 01-794 4159.
Arthur F. Young, Ellunderstrasse 21, D-2391 Wallsbull, West Germany (bowed & plckd str instrs; M,P).

Conservation: Gary Sturm

String Instrs General: Ramón Comas, Wesley Wadsworth
Dulcimers: Mark Spoelstra       Keyboards General: Bill Elliott
Pianoforte: Ramón Comas, Mark Spoelstra
Harpsichord etc: Paul Irvin, h
Clavichord: Paul Irvin, Mark Spoelstra
Plucked Strings General: Arthur Young       Lute: Donald Warnock
Guitar: Ramón Comas                Vihuela: Donald Warnock
Bowed Strings General: Arthur Young       Bows: Wesley Wadsworth
Violin Family: Ramón Comas, Wesley Wadsworth
Viola da Gamba: Donald Warnock       Hurdy-Gurdy: Mark Spoelstra
Wind Instruments General: Bill Elliott (delete C. Stroom)
Woodwind General: David Mayes, Norman Sohl, Mark Spoelstra, Andrew Willoughby
and directly controlled by auditory output, with no other measurement taken than the Pitch. Historical acoustical forms come out very precisely, as a secondary consequence of sound-reconstruction. The dolmetch idea is opposite, right sound and function comes out as a consequence of material and surface reconstruction. My results are sold among the best copies in the "material and measurement copy" tradition.
2. Mr Peckham highlights the problem of crescent-shaped ribs. This can lead to wastage of rib material which must necessarily be wider than the widest part of the rib. In order to avoid this wastage the old makers frequently arranged for ribs not to come to a point at the lower end of the lute body:

e.g. very flat cross-section

The 11-course Railich lute shows this

e.g. very hump-backed cross-section

There are several late German lutes that show this feature.

These effects apply only at the lower end of the lute. The ribs do all come to a point (more or less) at the neck end.

I realise that this adds a great deal of difficulty to the automatic computation of rib shapes. I issue this as a challenge to computer graphics experts.

Comm 420 - 'Lute Action' by Lawrence D Brown

I would like to suggest that figure 1 be amended to show how the rose bulges upward as Mr Brown indicates in the text:

The reason for this effect is, I think, that the hefty bar just below the rose stays straight and so dishing below it leads to bulging above it, i.e. at the rose.
Mersenne, Praetorius and the English Viol Pitch Standard: Problems of the History of Early Pitches

Nicolas Meeûs

Eph Segerman discussed in Comm. 442 passages from Mersenne's Harmonie universelle and from Praetorius' Syntagma on the tuning of English viols. His interpretations seem to me questionable, among others in that they assume that the passages discussed are concerned with the pitch at which the viols played.

Mersenne wrote (vol. III, p. 198f.): 'Now it must be noted that the English ordinarily play their pieces a tone lower than the French, so as to render the harmony softer and more charming, and that consequently their sixth open string makes the C sol whereas ours makes the D re sol (...); from where it follows that they mark several flats and sharps of which we ordinarily make no use'.

Mersenne also reproduced a fragment of a Fantaisie à six parties 'composed by an excellent viol player of English nationality' (p. 200). R. Vaught has shown (GSJ XVII, 1964, p. 177f.) that the composer was Alfonso Ferrabosco II and that the fancy survives in six English manuscripts; it is there given in C with a signature of two flats, while Mersenne reproduces it in D with one flat. The bass part reaches the low C in the English versions in C, but Mersenne's fragment does not include the passage where it does so.

Eph's deductions can be summarized as follows:
- although Mersenne may have meant that only the 6th string of the bass viol was tuned a tone lower, he more probably quoted it as an example while in fact all the strings of the English bass and treble viols were tuned a tone lower than in France.
- transposing down a tone cannot involve both sharps and flats, so that the final part of Mersenne's statement cannot really follow from what precedes. Mersenne probably did not merely discuss what happened to the Ferrabosco fancy, but meant more generally that the English viol players were willing to play with more complex signatures than the French.
- the nominal tuning of the bass and treble viols probably was the same in England and in France, so that 'the hypothesis that English viols played at a tone lower pitch standard than the French is by far the most probable' (Eph's own words). The unusual flats and sharps which the English played may have been those made necessary when viols at the lower pitch standard played with other instruments at 'proper' pitch.
The drawback of these hypotheses is that they take no account of what happened to the Ferrabosco fancy. If Eph were right, it would appear that the English viol players not only played at a tone lower pitch standard than the French, but also sometimes wrote their music a tone lower, so that in effect they played a major third lower than in France. Also, not only were their viols tuned a tone lower than in France, but also they sometimes had to tune the 6th open string of the bass viol a tone lower still, to reach the low C. Mersenne cannot have meant all this!

The crux of the matter resides in the sentence 'from where it follows that they mark several flats and sharps, of which we ordinarily make no use'. It must be realized that Mersenne's term *diese* ('sharp') probably denoted the sign by which a note is raised a chromatic semitone above its normal pitch, even when it was applied to raise a note that otherwise was flat (in which case we would rather write a natural). Transposing down a tone involves two flats, which at times may have to be sharpened: the final part of the statement does logically follow from what precedes.

It may also be noted in passing that Mersenne said that the English 'mark' unusual flats and sharps, which seems to imply written rather than ex tempore transposition. It becomes evident, then, that the publication of the Ferrabosco fancy by Mersenne a tone higher than in its English versions, only two pages after the statement that the English wrote their viol music a tone lower than the French, cannot have been a mere coincidence.

The English version of the fancy, in C, must have been the original one (that is, Ferrabosco's). Mersenne probably was himself responsible for its transposition up a tone; at least, he must have been aware of the version in C: otherwise he would have had no knowledge of the English usage to which he refers. It is not sure, indeed, that this usage existed to any large scale (see Vaught), so that one may surmise that Mersenne's knowledge of it was based mainly, if not exclusively, on the Ferrabosco fancy.

For some reason, Mersenne considered that the version in C would have been inconvenient for French viol players, and that it would better be transposed up a tone. The reason cannot be that he wanted to avoid the low C and the scordatura of the 6th string of the bass viol, since the passage with the low C (or low D after the transposition) does not appear in the fragment that he quotes.

Some might want to speculate that his reason for transposing was that he knew (or believed) that the English viol pitch standard was a tone higher than the French, and that he wanted to compensate for this. But this cannot be, because Mersenne's statement about the English playing with a 'softer and more charming' harmony would become meaningless.

Another possibility would be that the English and French viol pitch standards were the same, but that the music was written a tone lower in England, 'so as to render the harmony softer and more charming'. It is hard to imagine that playing a tone lower could be thought to make such a difference, at a time when pitch obviously was not much standardized. A conscious standardization of viol pitch between France and England would have been possible only if the French and English viol players had been very much concerned with matters of pitch. But much of what Mersenne said in the passage under discussion indicates that they took these matters lightly.
Mersenne wrote that the English ordinarily play a tone lower than the French — implying that they did not always. Mersenne himself did not hesitate to transpose the Ferrabosco fancy, apparently without regard to the possible intention of the composer, merely to avoid flats and sharps of which the French ordinarily made no use — implying that these flats and sharps would not have been considered utterly unplayable in France.

There exists a solution that appears to avoid all these problems, namely that Mersenne was not speaking of the pitch at which the English viol players wrote their music, but of the key in which they wrote and played. He may have considered that the key of C, with two flats in the signature, yielded a soft and charming harmony, nevertheless analyzing the fancy as being in the mode of D. He would then have viewed D as the 'natural' key for this piece, and one flat as its 'natural' signature. He may have conceived that the key of C, even although chosen by the composer, was a transposed key for this piece, and he felt authorized to 'detranspose'.

The validity of Mersenne’s statement would then become independent of any consideration of pitch: there is no reason to suppose that Mersenne knew about the English viol pitch, nor that he bothered about it. He was concerned with matters of modal ethos of which we have little understanding today, and which as a matter of fact may have been quite esoteric already by the early 17th century.

Eph also discusses a passage by Praetorius on English viols (Syntagma, vol. II, p. 44): 'The English, when they play something on viols alone, make everything sometimes a fourth or sometimes a fifth lower, so that they reckon and hold the lowest string of the small bass for D, of the tenor and alto for A, of the treble for e, while otherwise each one is tuned a fifth lower (reckoning by Cammerthon), namely the bass in GG, the tenor and alto in D, the treble in A, as can be seen in the table above. And this gives in this tuning (?) in diesem Stimmwerck might, I think, also mean 'in this instrumentation' — in this case with viols alone) a much more pleasant, magnificent and majestic harmony than if one remained in the ordinary tone (im rechten Thon: pitch or key?).'

Despite minor difficulties, the general meaning seems clear and Eph’s deductions unescapable: the English pitch standard for broken consorts was similar to the German Cammerthon, but when they were alone the English viol players liked to play at another pitch standard a fourth or a fifth lower. They did so by renaming their strings, D, A and e instead of GG, D and A.

Apparently, we are here in front of a case of double standard. It is odd, however, that the two standards should be sometimes a fourth, sometimes a fifth apart. Eph imagines a scenario where Praetorius has been misled by a viol tuned with a scordatura, but that explains nothing: even if he had been mistaken and later suspected the mistake, Praetorius would have said that the pitches were 'either a fourth or a fifth apart', not 'sometimes a fourth, sometimes a fifth'.

But playing a fourth or a fifth lower must not necessarily have involved a new pitch standard. Rather than playing at a pitch standard a fourth or a fifth lower than normal, the English viol players may merely have transposed their music down a fourth or a fifth, which is conceptually entirely different even if the practical result would have been the same. While two pitch standards hardly could be a fourth or a fifth apart, whether the transposition was down a fourth or a fifth probably depended on such trivial considerations as whether the piece involved more flats or more sharps.
In any case, the transposition must have involved shifting one size of viol towards the larger sizes, taking for instance an alto/tenor viol for the discant part, basses for the alto and the tenor, a double bass for the bass, etc. Praetorius actually describes this procedure in some detail in vol. III of the Syntagma (part. III, chapter VII, especially p. 163ff.), where he does not present it as specifically English, nor as restricted to viols. He appears to have considered that instruments of low tessitura, such as trombones, crumhorns or viols, sounded better in their larger sizes.

It would seem at first thought that whether Praetorius described a transposition practice or a case of double standard makes little difference. It does however in my opinion shed an entirely different light on his statement. If he was not speaking of pitch standards, there is no reason to assume that he wanted to establish a relation between English and German standards. Therefore the term Cammerthon in the passage under discussion may not have referred to the German Cammerthon, but merely to an English chamber pitch, the one at which English viol players played when they accompanied other instruments.

In short it appears that two texts, which Eph thought could be used as evidence for the English, French and German viol pitch standards of the early 17th century, actually may not be concerned with pitch at all. On the contrary, as they testify that viol players did not hesitate to transpose at their convenience, they provide evidence against the idea that the pitch of viols could have been much standardized at that time.

The matter of early-17th-century viol pitch standards was not central to Eph's argumentation in Comm. 442, so that the above does not necessarily invalidate his conclusions. It appears nevertheless that utmost care is needed when making use of data relating to early pitches. To try and make 'a reasonable story about what was' is a sound method only insofar as the idea one can form of what is 'reasonable' concords with 'what was'. I am afraid that, often, 'what was' cannot be called 'reasonable' by our conceptions. It appears indeed that while early musicians had reasonably well fixed and widely accepted pitch standards (such as Praetorius' Cammerthon), they did not feel compelled to play at these standards and did not hesitate to depart from them for reasons which we would think futile. It is striking that both cases discussed above concern music for viols alone — that is, music that could be transposed without major difficulty.

Quite a few early pitch standards can be ascertained today with satisfying precision, usually by considering the physical dimensions and properties of an instrument together with its nominal tuning as given in early treatises. This is perfectly legitimate and the standards so ascertained did exist and are important. Nevertheless they represent but the visible part of the iceberg. A full account of the history of pitch must not only say which standards were available where and when, but also discuss whether these standards were adhered to when and why. This aspect of the matter is of utmost complexity — which does not mean that the problem is insoluble, but well that there can be no simple solution.
Response to Comm 490 on English Viol Pitches

Eph Segerman

Nicolas has invited concurrent response. First of all, let me agree with the basic ideas of Nicolas's conclusion:

1. What seems reasonable to us today might not lead to good history because we might understand things very differently from early musicians;
2. Transposition was a very common practice amongst early musicians, and
3. The pitch that a piece of music was performed at is a more complex issue than the observance of a pitch standard.

As for point 1, I doubt whether Nicolas will disagree with the procedure of doing our best with our current understanding, but being prepared to change our historical picture as our understanding deepens. He is very concerned with trying to learn how to look at music the way early musicians did, and is much better equipped for this task than I am. I look forward to learning much from him in this area.

Points 2 and 3 underline that early musicians chose pitches to play at which were most convenient for them at the time, and a pitch standard was just another convenience which was much less important a part of their performance traditions than it is for us today. In this respect (as in many others) the early music movement follows modern performance traditions rather more than early ones.

Nicolas's warning not to take my conclusions concerning pitch standards in Comm 442 in the modern rigid way would be most apt if musicians today would take any notice of them. But this is most unlikely since a modern 'early' musician cannot restrict himself to the repertoire of one place and time. So for his convenience, a standard such as 'modern early' at a=415Hz is adopted as a compromise and Comm 442 is just an exercise in historical scholarship.

As for Nicolas's conclusions concerning the statements by Mersenne and Praetorius about English viols, I remain unconvinced. He mentions various problems with my analysis of Mersenne's statement:

(1) My analysis would lead to the English playing the Ferrabosco Fancy at a pitch a major third lower than that at which the French would play it at. He then states "Mersenne cannot have meant all this!" Considering the view that he and I both have about pitch relativity, I can't see anything wrong with "this".

(2) A problem with my analysis (which I pointed out) is that the second part of Mersenne's statement can follow logically from the first part (as Mersenne implied), only by assuming that Mersenne was speculating about transpositions English viol players would have to make when playing with other instruments. According to Occam's razor, another hypothesis which explained everything as well but without this assumption would be better than mine. Nicolas's point that Mersenne's term 'die e' could mean # as well as # is a good one. Then Mersenne could be referring to accidentals in the music (resulting from the notation) that the French did not usually use, rather than the key signature. Such marks in the English key of the Ferrabosco piece would be a before a, and a # or # before e. This logically relates the two parts of Mersenne's statement only if the first part referred to the notation as well. This is the basis of Nicolas's suggested solution to what Mersenne meant. Nicolas suggests that when Mersenne wrote "The English play their pieces a tone lower than the French", he meant that the English notated their music a tone lower than the French would, with actual pitch being irrelevant.

As Vaught pointed out, a key signature of two flats (leading to accidentals that the French would not usually use) is not at all common in English viol music, so the second half of Mersenne's statement is as untrue with Nicolas's explanation as with mine. Nicolas's scenario requires that Mersenne's experience with English viol music was confined almost entirely to the Ferrabosco piece. I would think that it is most unlikely that Mersenne was such an incompetent observer as to make general conclusions about a whole repertoire (that
was famous throughout Europe) from such limited evidence. It is much more likely that he knew much more about that repertoire and the mistake was in assuming that English viol players didn’t retune their strings for different playing circumstances.

In Nicolas’s discussion of my analysis of the Praetorius statement on English viols, he seems to have misunderstood my scenario for Praetorius’s mistake. By testing the sixth strings of the various viols (the ones he reported on) Praetorius would have deduced that the English viols were tuned as the German ones. An English informant telling him what the bass viol nominal pitch was would lead him to deduce the wrong nominal pitches for the other sizes and the wrong difference of a fifth between English nominal pitch and actual pitch in Cammerthon. Additional information from the same kind of source would have correctly indicated that this pitch difference was usually a fourth. He thought he observed the fifth himself, so he would naturally write “sometimes a fourth, sometimes a fifth” with no “or”. The scenario assumes that he did not suspect that he made any mistakes since his information included both with no hint of uncertainty.

Since the maximum open-string range for a bowed instrument at that time was about 2 octaves and a fourth (as exemplified by some tunings of the viola bastarda and the lyra viol) and the actual open-string range of normal viols was 2 octaves, there was a pitch range of a fourth that viols could tune up or down within to follow aesthetic preferences or practical considerations. Our analysis has indicated that the top of this range of a fourth for viol of normal size for the 17th century (as given by Praetorius and Talbot) is a tone below Cammerthon. The bottom is a fifth below Cammerthon. This tuning freedom makes it more appropriate to associate the names of the various viols with size rather than with pitch. All sources are then consistent. The muddle that modern viol researchers have fallen into has resulted from trying to associate names with pitches. Another confusing factor is that modern viols are designed to be able to play at modern pitch, being based on surviving solo basses (which were smaller than basses of sets), with trebles and tenors scaled accordingly.

I assume then that when English viols played alone, Praetorius’s information is best interpreted to indicate that they tuned a fourth below Cammerthon, and when playing with other instruments they could tune their strings up a minor third to a tone below Cammerthon.

The hypothesis for explaining Praetorius’s comments on English viols offered by Nicolas is that sizes one step larger than usual were used. He supports it by a general statement of Praetorius about such a practice on various instruments in Volume III of Syntagma. This practice seems also to be what Banchieri (Conclusioni . . . 1609) was describing for Italian viols.

Banchieri gave the names and tunings of four viol sizes (all with six strings and normal relative tuning): "Quarta viola in soprano" with highest string at g', "Viola mezana da gamba" with that string at d', "Violone da gamba" with it at g and Violone in Contrabasso at d. He stated that all pitches are given according to the organ standard in Bologna. That standard is unlikely to have been more than a semitone away from Cammerthon. I assume that the viol sizes were the same as those given by Praetorius and Talbot and not in between sizes. At the lower end of the range of a fourth that each viol can be tuned to for its size, Banchieri’s instruments would be identified with Praetorius’s cant (treble), tenor-alt (tenor), klein bass (single bass), and gross-bass (double bass). At the upper end of that range for each viol, they can be identified with the tenor-alt (tenor), klein bass (single bass), gross-bass (double bass) and gar-gross bass (no English equivalent). I favour the second choice on four grounds:

1. Viols have greater projection of sound when tuned high within their possible ranges. Since we would expect Italian performance style to be extrovert and dramatic, such a use would be appropriate. By contrast, Praetorius’s tuning of viols low in their possible ranges (his klein-bass is at the bottom) is more appropriate for the German tendency towards conservatism and moderation.
2. All the information in the 17th century relating names and sizes where the name "violone" appears (Praetorius and Talbot) associate that name with a viol of the size called "gross
bass" by Praetorius ("double bass" by Talbot) and never with that called "klein bass" by Praetorius ("single" or "consort bass" by Talbot).

3. The only source in the 17th century that gives a bowed instrument size to associate with the name "contra-bass" is Praetorius, and that is the largest size of viol there was; the "gar-gross bass".

4. Banchieri did not use the usual names for viol sizes in Italy and used the term "quarta viola in soprano" implying that it was different from the straightforward "viola soprano" one would expect if it was the standard size.

While thus supporting Nicolas's idea that sets of viols one size larger than the normal set were sometimes considered as sets in themselves, I cannot agree that Praetorius meant this when discussing English viols. That is because Praetorius very clearly used the size names of the normal set. One might argue that those names are names of voices in the music rather than for specific viol sizes. This is only partially true since the names usually meant both. When both were not simultaneously the case, some clarification might be expected if a scholar-teacher is writing about it. So Banchieri used "in soprano" to denote the voice part but had to use "quarta" to indicate that it was different from the traditional soprano size (usage similar to 'quint bass' by Praetorius and '3/4 violin' today). If the English viols which were tuned the same as German viols, as Praetorius stated, were one size larger, he surely would have indicated this in some way. We must keep in mind that Praetorius was attempting to be comprehensive and that he was assuming very little prior knowledge of his intended German readership.

Alternatively, Nicolas may be considering that the English viols were normally one size smaller and that the players switched to the sizes depicted by Praetorius when playing alone. This is equivalent to Ian Harwood's hypothesis described in Early Music (Oct. 1981). This possibility requires a high treble instrument of the size of the late 16th century Italian instrument made by Gioan Maria in the Hill Collection at Oxford. That is likely to be of the type of viol specified as "soprannino" in the 1589 Intermedii and called "violetta picciola" by Zaccom in 1592; a solo-viol competitor to the violino which was rapidly rising in popularity. The high-treble viol could have had some players in England, but Praetorius clearly hadn't seen one. He would certainly have mentioned it if he did. From his comments on the Lyra, we know that Praetorius read Zacconi. He was confused by Zacconi's mention of "violetta picciola" as a small viol since "violetta" was a 16th century term for fiddle. Apparently to play it safe, Praetorius listed "violetta picciola" both as a treble viol and a fiddle. Thus Praetorius's non-recognition of the high-treble viol plus his use of normal size names makes it quite unlikely that his statement about English viols referred in any way to a set of viol one size smaller than his normal set.

Nicolas refers to the "broken consort" playing in Cammerthun. (Since Morley and Rosseter didn't require the adjective "broken" as a specification, I won't use it either.) Praetorius's information on English wire-strung instruments seems to indicate that they normally played in Cammerthun. Morley and Rosseter specified a treble lute. German and Italian linguistic equivalents to "treble lute" were normally tuned a tone higher than the usual lute size (called "mean lute" in England). This implies that the treble lute probably was also a Cammerthun instrument. Therefore, if a small solo bass and the aforementioned high-treble viol were used, Nicolas could be right. Harwood suggests a higher tuning with some ingenious further instrumental juggling. Without denying that such possibilities could have occurred at times (or even frequently), when Morley and Rosseter specified "treble viol" in their publications they would have expected that the usual treble viol (as Praetorius knew) would primarily be used. Then a tone below Cammerthun would be the consort pitch. Tuning Cammerthun instruments down a tone most seriously affects the lowest strings; and indeed the 7th courses of the lute and bandora are called for in this repertoire much less than in others.

In conclusion, though I have found Nicolas's interpretations of the statements on English viols by Mersenne and Praetorius constructive and stimulating, I cannot agree with them.
Some of Gaert Jan v.d. Heide's information on tuning woodwinds (Comm 457) contradicts my experience with recorders, namely the relations of hole undercutting and bore changes to octave size.

Using an organ blower and manometer for air, covering holes with plasticene, and measuring pitch with a stroboscope, I found no difference in the octave III-X from undercutting hole #7. Neither undercutting on the top side, or the bottom side affected this octave, which was chosen because the upper pitch is little changed by the amount of thumb-leaking. The instrument was a "choke-bore" tenor.

I don't trust my own lungs, ears, and thumb enough to judge such effects subjectively, and the times I've heard them demonstrated, the player seemed to be (unconsciously?) helping with breath, thumb-leaking and embouchure. I'm very interested, however, to see results of experiments with difference results from mine.

The accompanying graph shows octave changes when a ball of plasticene (½ bore diameter) was progressively inserted in the bore of a cylindrical flauto (in f). Positive c's indicate the octaves were widened. The results seem different from Mr. v.d. Heide's.

While I agree about lower, larger holes giving bigger octaves (there seems to be an error in paragraph "Further to a" on page 49), I'd add that lowering and enlarging holes below the first open hole widens octaves, too. On a choke-bore tenor, I replaced hole #7, ~2.7 mm higher, and another 7 mm lower. With the holes the same size, the upper gave an octave III-X 10c smaller than the lower, the lower's note III being 40c below the upper's. Enlarging the lower to give the same note III, the difference in octaves became 20c. Then using these two holes alternately to vent octaves IV-XI (fingered, or rather plasticened) and V-XII, I got both octaves 10c bigger with the lower, larger hole. For the octave V-XII, the combined venting of holes 6, 7, and 8 gives impressive changes with small shifting.

About mechanical devices, I find strobes (or CRT's) well worth the extra price: *They read better with background noise and instabilities in the source. *They indicate inharmonicity of octave overtones and their relative strengths and phases. *They can be read quicker, out of the corner of the eye. *They give patterns for all harmonically related notes, no change of setting needed.

For such experiments as above, I find them best.

The Widener punch-card black box is cheaper, more portable, good for setting fret temperaments and giving a drone for practicing with or checking intonation while playing. But the trio of LED's doesn't give very sensitive discrimination, while being too sensitive to noise and other instabilities.

The Korg meter is even cheaper and smaller, and even more sensitive to noise, instabilities, and volume.

Should F-Q go musicological and performance practical? I say no; there's a glut of such already. (A listing of periodicals so oriented could be given. Many small, new ones are crying for material, in case someone wants to slip some comments into print. Attention could be called in F-Q, to those articles and letters of potential interest to readers.) But I'd like to see more comments on relations between musical affect and instrument design, aesthetics of sound, etc.
Fingering the Gaita Galega: The Horse Speaks

In FoMRHIQ 24 (July 1981) Comm 355 Paul Gretton wrote in asking for horse's mouth information about the fingering of the gaita galega, an instrument whose importance for devotees of early music lies in its being "typologically a more-or-less unchanged version of the most common western-European medieval bagpipe", as he put it. He provided a fingering chart drawn from V. Cobas Pazos, Espazo de un estudo sobre la gaita galega (Santiago de compostela, 1955), and raised questions concerning (1) the use of semi-closed fingering, (2) the extent to which the second octave of the instrument is used, and (3) the tuning of the instrument. The recent visit of Raparigos, a traditional galego quartet comprising two gaitas, a side-drum known as tamboril, and a bass-drum called bombo, provided an opportunity for close contact with some of the leading exponents of this music. Although Raparigos means 'young ones' they are a group with some fifteen years experience of playing traditional music, and their leader, Xan R. Silvar is an outstanding gaiteiro. During their visit I was able to have extensive conversations with Xan about techniques of playing the gaita and to pursue an enquiry that we have been conducting for some time into the regional and historical variations in techniques of performance of the instrument. So here at last is some information, if not directly from the horse's mouth, relayed directly from that source.

Galicia, Asturias, Portugal

In the Iberian peninsula the word gaita is applied to various instruments that are by no means all bagpipes, or even wind instruments. However, in this communication we are concerned with the bagpipe having a conical-bore chanter and (normally) a single drone approximately twice the length of the chanter and carried on the left shoulder. Some of the gaitas in Galicia do have two or even three drones, the extra drones being carried on the forearm. In Asturias the instrument is called gaita asturiana, in Galicia gaita galega, and in Portugal gaita de foles. Our focus remains on the Galician instrument which has three forms: (1) gaita grileira, (2) gaita redonda, (3) gaita tumbal, corresponding to the tonalities of D, C, and Bb respectively.

Talking in general terms about the performance of a genuine folk instrument is a difficult problem. The danger, of course, is to make generalisations based on one's own immediate experience and to ignore the true diversity and variation that exists between different players and regions. Galicia is a mountainous country where communications are poor and travel is estimated not in kilometers, but in hours. Gaiteiros themselves may remain ignorant of techniques that are used in other parts of the country. Most players employ the techniques they have learnt from older players and local teachers, and these techniques will be adapted to the type of instrument and reed used in that region.

Pepe V. Ferreirós, Xan R. Silvar, Ricardo Portela

The charts in basic tutors of the gaita galega invariably describe open fingering systems. Enrique Otero Covelo, Lecciones de gaita (Vigo, 1978) gives the following:
This chart is written as for a *gaita grileira* in D although the actual pitch is one octave higher. The same fingering is applied to all three gaitas. The *gaita redonda* will sound a minor seventh higher than this notation and the *gaita tumbal* will sound a minor seventh higher.

The advantages of teaching beginners the open style are obvious. However, many players continue to use this style exclusively and to great effect. Xan tells me that this system is used by Pepe V. Ferreiros of the highly popular and successful group *Milladoiro*.

Xan was taught by the late Constantino Bellón to play in both open and semi-closed fingering styles. He selects open or semi-closed fingering according to the specific requirements of the melody that he is playing. His decisions rest on questions of digital facility and security as well as the tone colour required. Xan has provided the following chart of his fingering:

While Xan uses a mixed system, another fine piper, Ricardo Portela, consistently uses a semi-closed system. Acting on my request Xan asked Ricardo to provide a chart of his fingering, Ricardo responded by sending a cassette tape describing his fingering and Xan has made the following chart from this recording:
Fingering Charts in the "Cancionero musical de Galicia"

Casto Sampedro y Folgar in the Cancionero musical de Galicia: Colección de la Sociedad Arqueológica de Pontevedra (Pontevedra, 1942; reprint ed., La Coruña, 1982), containing material collected between the years 1884 and 1942, provides three fingering charts. He describes an open system for the gaita grileira and forms of closed system for the redonda and tumbal. It is interesting to note that in the closed system the minor third above the six-finger note is not available. In this system the popular melodies, like the muñeira de cabana, which alternate between major and minor tonalities, and are played by most gaiteiros nowadays, would not have been playable.

Notice also that the grileira chart refers to a key giving the first note of the second octave. In the article on the gaita in the Gran Enciclopedia Gallega it is affirmed that as many as three keys were added to the gaita, but that the inclusion of these keys was considered by the connoisseurs of the instrument to be a failing (desmérito). For my part, I have never seen a gaita chanter with keys and imagine that such instruments are very rare indeed.

The charts for the redonda and tumbal show the right hand above the left although the editor of the Cancionero says that in the original manuscript this had been corrected to show the left above the right. Here are the charts:

**Gaita grileira**

![Fingering Chart for Gaita Grileira](image)

<table>
<thead>
<tr>
<th>LH</th>
<th>RH</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Fingering Chart for Gaita Grileira LH" /></td>
<td><img src="image" alt="Fingering Chart for Gaita Grileira RH" /></td>
</tr>
</tbody>
</table>

The key refers to the first note of the second octave.
At an early stage in this enquiry we had hoped to be able to say that there is a clear historical progression from closed or semi-closed to open fingering systems. We were working on the hypothesis that in recent times gaiteiros (whose function is largely to provide dance music) would often double on clarinets, saxophones, etc., and that their playing of such instruments might have influenced them in the supposed move to open fingering styles. If it is proved that such a change in performance techniques is taking place during the course of this century, two questions may be asked: (1) is this a radical departure from the time-honoured traditions, or (2) do techniques change with such regularity that the current developments can have little significance for the performance of medieval bagpipe music?

**Going "up there"**

The fingering included in V. Cobas Pazos, *Esbozo de un estudio sobre la gaita gallega* describes a range extending from B above middle C to A an octave and a seventh higher. There is no doubt that the gaita galega is capable of climbing to these heights, provided that the blades of the reed are sufficiently closed. However, Galician melodies do not exceed the limits shown in Xan's fingering chart. Many tunes use the ninth above the six-finger note and pipers play this note with complete fluency and good tuning. Notes above this are much less frequently encountered.

Paying to the second octave: (1) by half covering the nb-hole completely.
Tuning

The three gaitas - grileira, redonda, and tumbal - were described above as being in D, C, and Bb. It would be more accurate to say that in the past they have approximated to these pitches. Perhaps the recent tendency to mix pipes with other instruments has caused a move to conformity in the question of pitch. However, not all of the pipes made nowadays are intended to conform to modern concert pitch. The gaita that is described as playing in do brillante, for example, sounds rather sharp of C.

In the article on the gaita in the Gran Enciclopedia Gallega it is suggested that the diatonic scale of the gaita exhibited "certain deviations and peculiarities" which mistakenly came to be considered as the result of anomalies in the construction of the instrument. The greatest controversy surrounds the tuning of the sharpened leading note (C sharp in the case of the gaita grileira, B natural in the case of the redonda, and A natural in the case of the tumbal). In the Cancionero Casto Sampedro y Folgar suggests that where modern tonality requires a sharpened leading note the gaiteiros used to substitute a natural. Jesus Bal y Gay in the article "Panorama de la musica gallega" first published in theJournal Galicia (Buenos Aires, July 1940) observed that the sharpened leading note lies half way between the sharp and the natural.

It is interesting to note that Ernesto Veiga de Oliveira in his book Instrumentos musicais populares portugueses (Lisbon, 1964; reprint ed., Lisbon 1982) arrives at the conclusion that the Portuguese gaita de folas originally had a special scale of an "exotic or para-modal type, with more or less defined microtonal intervals, which would coincide with the local vocal forms... There would always have been variations in the scale, uncertainties and irregularities, resulting from a construction which was not preoccupied with strict intonation..."

It would be interesting to conduct a detailed and scientific examination of the tuning of modern and antique chanters following the model of the commendable enquiry carried out by J.M.A. Lenihan and S. MacNeill in which Scottish highland bagpipes were subjected to clinical tests in order to discover the standard pitch of the instrument and the tuning of the chanter. Although we have made no such tests, it may be said with some confidence that the scale of modern Galician pipes (like the excellent instruments made by Antonio Corral) do not have a particularly idiosyncratic scale but conform to modern norms. If any idiosyncrasy does remain in the tuning, it lies in the raised leading note (and here I am referring to the semitone below the octave and not the seven finger note) which may often be flat. As a corollary of this, the flattened leading note may often be a little sharp. Xan advises, however, that the playing of chromatic notes requires a very exact control of the bag, and after all, it is in the control of the bag that the skill of the gaiteiro resides.

Where the gaita galega is being used as a surrogate medieval bagpipe an attempt should be made to adjust the intervals of the scale in accordance with the tuning systems in use at that time. Of course, bagpipe chanters may be intransigent in the matter of tuning, but if the player holds in mind (the Pythagorian system, for example) a more authentic performance should result.

Notes:

1 Out of respect for the Galego language I have tried to give names of instruments and players in the Gallego spellings. Thus we read Galego, not Gallego, gaiteiro not gaitero (bagpiper), Xan not Juan. V. Cues Pazos' book Estudio de un estudio sobre la gaita galega is written in Castellano and therefore retains the Castellano spellings.
2 The gaita de la sierra de Madrid or gaita madrileña, for example, is a hornpipe with a single beater-reed like the Welsh pibcorn. For a further discussion of this instrument see M. García Matos, "Instrumentos musicales folklóricos de España", Anuario musical XI (1957) 123-64. The article on the gaita in the Gran Enciclopedia Gallega further lists the gaita de Estella (otherwise known as gaita de navarra or dulsaín). The gaita morisca, gaita salamanquina, and gaita zamorana are listed as aerophones. The name gaita zamorana is applied also to the hurdy-gurdy, which is also called in Castellano, gaita de rueda.

3 I am told that pipers in Asturias use two octaves. Unlike the Galician pipers who perform in groups of two or three gaitas accompanied by percussion instruments, the Asturian tradition is for only one piper to play with percussion accompaniment.

4 Xosé Luis Foxo in Os segredos da gaita (La Coruña, 1982) recommends that the second octave be played by half-covering the hole that falls under the index finger of the left hand. Xan and Xabier Pariñas of Raparigos respectfully suggest that this is a tontería. Certainly it does not work on my instruments and I have never seen any pipers using it. The Cancionero chart for the gaita tumbal shows the thumb-hole as completely closed for D' and E'. The upper octave is gained in this case by an increase in pressure on the bag.


Discography

The playing of Xan Silvar and Xabier Pariñas may be heard on the record Raparigos: Galeiros Galegos Vol I (R-126-D), and the playing of Ricardo Portela on Festa en Viascon: Galeiros Galegos Vol II, both produced by Ruada, S.A., Nosa Señora de Luz, 15 baixo, A Coruña, Spain. Pepe Ferreiros is heard playing in traditional style on In Memoriam Faiscas do Xiobre on the Guimbarda label (GS - 11006) and in a more commercial recording on Milladoiro (CBS 325248).

FoMRHI Comm. no. 434  Health-shop Historicity

À propos of plastic membranes on eunuch flutes, nylon lute-strings, plastic crumhorn reeds, and so on, it strikes me that there are two ways of looking at historicity. One is to be a complete antiquary: totally to pursue authenticity: to follow the practices of the early makers as absolutely as skill and knowledge permit. The other is to posit the contemporaneity of history: to treat the fact that early musical instruments ever fell into disuse as a historical accident: to conceive of a world in which lyres, psalteries, shengs and rebecs never cease to be played: and to ask how any maker of any period should view a synthetic material if it possesses exactly the same properties as a much more expensive and undurable natural material. At the moment there is no perfect substitute for gut strings or reed reeds. Many of us are quite glad about this: our express affection for natural materials is in part a protest against the horrendously synthetic, stainless-steel-and-plastic-coated-chipboard, polished-rice-and-bleached-flour-with-monosodium-glutamate-and-permitted-artificial-flavouring culture that we inhabit. But how should we react if some day a cheap, durable, non-carcinogenic, and absolutely perfect substitute were to be found for animal gut or for cane reed? We should have to welcome it. So until that day arrives (and it may never, but we're not at liberty to make up our minds in advance), let us cease to depurate the efforts of the Ersatz technologists. At present they see through a glass darkly, but it may not always be so.
Then fair Ophelia on her tunic put
And sang The Willow Song in runic Jute,
Accompanied by Lasso's Munich lute
And tuneful hoot unique of eunuch flute.

Why is nobody making the eunuch flute? We have it on the authority of Mersenne that it was an instrument serious enough to be used for consort music in four or five parts. Both a period specimen (in the museum of the Paris Conservatoire) and a period illustration (in Mersenne) have survived to modern times. By contrast, we have neither specimen nor picture of the cornamuse, and yet we're making cornamuses by the hundred at least. (Highly imaginative efforts in some cases, with huge resonance chambers which owe nothing to Praetorius.) And some of us, including myself, take the historical liberty of making gemshorns in consorts. So what forbids us to revive the eunuch flute? If we say that a glorified kazoo couldn't possibly have been used in serious music, then we're saying that we know better than Mersenne. More dangerous than the suppression of a single instrument is the confirmation of our own prejudices as arbiters of what is a respectable method of sound-generation and what is not. There is no place for Grundyism in organology.

To save readers running off in hundreds to see what Mersenne actually has to say about the eunuch flute, I print below the relevant paragraph and illustration from Proposition IV of the fifth book of Harmonie Universelle. The words quatrieme Chalumeau refer to the instrument fourth from the left in Mersenne's drawing, which is not the work of his best artist (some day I mean to write an article about Mersenne's different artists entitled The Good, the Bad, and the Ugly), and which raises problems that can only be solved completely by reference to a period instrument. I've written off to the Paris Conservatoire people asking for details of their eunuch flute, and in time I'm going to write a proper scholarly article on the instrument, but for the present I want only to communicate a few findings based on two glorious days of oegophonous experiments in the workshop. Mersenne gives no dimensions, so after a bit of guesswork (partly but not too earnestly based on comparison with the four other instruments in his drawing) I turned up a maple tube about 16" long, of external diameter 1" and internal diameter 3/4", belling out for the last couple of inches. I drilled a voice-hole 5/16" in diameter, fitted a membrane, and turned up a cover-cap to sit over this. Then, being uncertain as to whether the illustrator's hatching denotes an open or closed bell, I covered over the bell temporarily with a circle of thin plywood. (In the other instruments shown in this drawing plain black = an open hole, and in the second instrument from the left hatching = solid wood. Cf. the second illustration in Proposition XXVIII of book 5.)

Now the findings:
1. The instrument won't work; there is no escape for the air. Since what goes in must come out, if the bell is really covered over as the drawing suggests then there must be one or more holes on the other side of the body. Mersenne has nothing to say about any such holes (and that the mirliton has them two centuries later proves nothing).
2. If you do drill escape holes there's no real point in having a covered bell: the sound of a holed, unbelled, end-stopped eunuch flute differs extremely little from that of a holed, bell-stopped instrument.

3. If you don't drill escape holes but leave the bell uncovered, you get a magnificent sound, which with my unremarkable voice and to my ear seems like a mixture of tenor sackbutt and raucous tenor crumhorn! In tests which caused my family to believe that I'd finally cracked up I found the membrane to respond readily to notes from E to falsett E. The player's vocal input is considerably amplified, and the membrane contributes noticeably to the overall sound.

4. Goatskin (the only leather of which I happen to have a stock) makes a good membrane if it is scraped paper-thin. It should be soaked after scraping and put on wet; as it dries, its tension increases. But the wetting occasioned by sustained use may reduce the tension a little. You can waterproof the goatskin to some extent by spraying its upper surface (viz. the one covered by the pierced cap) with Spectra clear cellulose car lacquer once the skin is taut and dry. The lacquer will immediately loosen the membrane, but as it dries out the skin will tighten up again — especially if you hold it close to an electric fire for four or five seconds. Three or four thin coats should be enough — you don't want a thick cellulose membrane lined with goatskin. (Those historically minded readers who have been offended by the mention of car lacquer and electric fires had better skip my next two sentences.) I have tried quite a few synthetic substances in place of skin, and one came an easy winner: Marks and Spencer crinkly white-with-green-writing plastic food bag (not the large shiny carrier bag). This is unaffected by moisture and exceptionally responsive.

5. Mersenne's membrane is tied on. If you use plastic bag, and make the fit of your cover-cap tight enough, you can simply tighten the membrane with circled thumb-and-index-finger and slide the cover-cap over it. The tenon should have a slightly rounded shoulder and be overlaid with cork.

6. If you make your cover-cap twice as long as shown, and ferrule it, so that the bottom of the ferrule meets the moulding above the voice-hole, it will be far more secure, it will cover the membrane's unsightly edges, and it will make sense of the moulding. I don't believe in the cover-cap as shown any more than I believe in a covered bell.

I haven't had time to make a set of five eunuch flutes yet, but I've used two tape recorders to piece together some consort music. Even a tracked-up version of Pastime with good company sounds incredible. I'm impatient to incorporate a set in my band. Can you imagine the audience's faces when a tutti scoring of Praetorius' Fallet des canes suddenly gives way to a consort of eunuch flutes for the second section?

P.S. (i) I permit myself to wonder whether the membrane would have been waterproofed in any way during the period. Might its upper surface have been coated with some resinous or chitinous substance? Can some more knowledgeable person tell us?

(ii) I should stress that this comm. describes only a crude and unscholarly attempt to see how the eunuch flute might work. Once I've actually seen one I may blush to read the foregoing!
Above left and centre, the relevant illustration and text from Mersenne’s Harmonie Universelle. Right, an enlargement of the quatrième Chalumeau.

David Z. Crookes
The 8 illustrated descriptions not covered in the first ed. are an organ positive by (?) Nicolaus Manderscheidt (c. 1635), 3 trombones (Nuremberg, 17th cent.), a watch-man's horn (Saxonian, 19th cent.), a chest-organ (Italian, 18th cent.), a guitar by Johann Georg Thielemann (1813), a harp (S. Renault/F. Chatelain, c. 1700) and two pianos (German, after 1800; Anton Pergina, c. 1840).

Of the 17 instruments described and illustrated in both editions, 7 have the same photos whereas 10 are new. The 10 new illustrations show the endeavour to give more organological details: however, whereas the printing technique in the first ed. is crisp and neat nearly throughout, for some of the pictures in the second ed. it is so blurred and mischievous in the choice of colours that one must ask how a renowned publisher such as Peters could let such a thing get through. Like with so many other books, the second ed. does not come up to the reader's expectations. All the same it is worth having the second ed. as a reference tool.

Perhaps I should mention that the museum has brought out a record under the same title which is absolutely first-rate, both regarding the choice of compositions (S. Scheidt, G. F. Buechner, H. L. Hassler, G. D. Speer, J. Schenck, M. Pratorius, Th. Morley, J. D. Zeleinka) and the the selection of museum instruments: trumpets, bassoon, viols, positive, regals etc. Whoever has easy access to the museum in Leipzig should get themselves a copy (Eterna 827 044).


This is the Catalogue of the Exhibition of his own collection of bassoons and related material that Bill Waterhouse put on at the 1983 Edinburgh Festival. There were 35 instruments (one racket, one curtal, one sordun, the rest bassoons of various sizes and dates, from Stanesby father and son to the present day). 28 of them are illustrated front and back. There were also reeds, reed-making tools, pictures, music, and written material.

There is a good deal of interesting information in the text, some of it new, some of it controversial, and a few slightly misleading statements, all I think due to compression. For example, the racket is described as having its reed surrounded by a pirouette, which is true for the Renaissance but not for the Baroque form; the new bassoon developed from the curtal "had a third key which extended its range to B flat — true enough, but it also had, perhaps more importantly, the addition of a bell joint. The only error I've found is the statement, describing the Renaissance racket, that "the double reed causes the cylindrical bore to function as a stopped pipe, whose fundamental sounds an octave below that of an open pipe"; in fact it does not matter what sort of reed you use; it is the cylindricity of the bore which compels this behaviour. A reed-blown cylindrical bore functions as a stopped pipe with a double or a single reed (or blown with the lips as a trumpet for that matter); a reed-blown conical bore functions as an open pipe with either sort of reed or with the lips. After all, saxophones (single-reed) function like oboes, but crumhorns (double-reed) function like clarinets.
Bill states firmly (and I am convinced accurately, though there has been a lot of controversy on this point) that the open note of the bassoon is f; in other words that the natural pitch is controlled by the downward bore and that the upward bore, vital as it is ("of critical importance to its complex acoustics") is an extension; he coins the term 'extension bore' for this part of the tubing. There are several other new, to me at least, and useful terms in this Catalogue: 'chimney' for the length of the fingerholes through the wood of the 'épaule' (the wing of the wing joint), and 'harmonic keys' for those at the crook end of the wing which don't themselves produce any note but which steady the high notes; a much better term, I think, than the old 'vent key' or 'speaker' (which should probably be restricted to the clarinet, and even there might be better replaced by Bill's term).

Bill's is the most important private collection of bassoons I know of (and the only collection with a couple of Stanesbys); if you're at all interested in bassoons, the Catalogue is a must. I hope that he will have copies here for our Bassoon Weekend, but if you're not coming to that, write to Arnold Myers at the address above for a copy (he asks that all orders should be accompanied by payments in £ sterling only).

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Jeremy Montagu


Katalog Band 5: Herbert Heyde, Hörner und Zinken, 272 pp, 80 pl, 1982. DDR Marks 65.—

Both available from the Museum or through Deutscher Verlag für Musik and their agents.

These are the two latest volumes in what is still the Number One Catalogue of our time. I've said it before, and I'll say it again, what Mahillon was to the end of the last century and what Bessaraboff was in 1940, these Leipzig catalogues by Heyde and Henkel are to us. It's not just Leipzig, either; Heyde has done similar catalogues for the Bach Haus in Eisenach and the Handel Museum in Halle (Wind Instruments has just been published; I bought a copy from Brian Jordan last week; his new address in Cambridge was in the Supplement in the last Q). I must confess, with some envy, that I don't see how they find the time to produce catalogues like these with such incredible amounts of detail. Everything measurable is measured; all the fretted clavichords have their frettings measured in cents (even with electronic boxes this takes time, especially with a clavichord with the dangers of differential pressure on the keys), string lengths and so on are given, as well as all the external and other dimensions of the cases. There are drawings of all the mouldings and the shapes of key-bars (what is the proper term for the part of the key inside the instrument?) and of the fronts of the keys if they are carved. There are oblique and plan photos of each instrument, also a number of detail photos, and colour plates of those which are decorated. Since there are 39 clavichords, ranging in date from 1540 to 1800, including a double-manual instrument with pedal-board, there is more information here about clavichords than anywhere else in the world; no book on the instrument can compare with this Catalogue. Incidentally, it also includes 25 dulcimers in equal detail. Any further comment would, I think, be superfluous, but I would just remark on
The Clavichord volume includes a chapter on the Fretted clavichords, which were still being made in Germany almost to the end of the 18th century. It's an instrument that is unjustly neglected today; with pairwise fretting you can play pretty well anything (not atonal music, perhaps, but who wants to on the clavichord?), but you've got half the tension on the case and the soundboard and half the tuning time. Don't let anyone tell you that semitone trills are impossible on such instruments; if they are difficult, it's because the fingering is clumsy; that's why Mozart and Chopin used clavichords for practising on — if you can play well on a clavichord, you'll sound super on other keyboard instruments.

The Brass and Cornett volume is even more detailed because it includes all the bore measurements. The volume includes the bass horns and serpents of all sorts and key-bugles and ophicleides, French horns of all kinds of course from trompes de chasse through hand horns to valve horns and Wagner tubas (interestingly there are no double horns in the collection; the nearest is an Alexander with terminal crooks, like a French model though with normal Alexander rotary valves, with an F and a B♭ alto crook and alternative valve slides); there are also posthorns and bugles of all sorts, alphorns, shofarot, oliphants, and a set of Russian horns, as well, of course, as the cornets listed in the title. In other words, all the conical bore instruments in the Museum which are blown by the lips. There is also a separate section for mouthpieces. There are the usual bore-graphs, sketches of key-systems and drawings of almost all parts of the instruments (keys, key-mounts, valves and their mechanism) serpent construction (where the joints come), and so on, and also of makers' marks and the decorative engravings on bell garlands and elsewhere. The photographs include some x-radiographs of cornets and of the Büchel (the folded alphorn).

Some people have complained that there is too much detail in these Catalogues. Certainly there is more than I could provide in a catalogue of the Bate or of my own collection, but that is no reason for complaining that other cataloguers are better than me! In fact, there are more details here than most people will want, but the detail that one reader thinks superfluous is exactly what another reader may need. Even when there are things here that one could argue about, all the evidence is here too; if one doesn't agree with the author (and I don't always agree with Heyde, especially on some of the brass instruments), I'm not worried because everything is here on which I can base my own opinion if necessary. So the more detail the better.

Another useful thing about all these catalogues is that they include all the instruments which were lost in the war, with all surviving details and, where they are in the archive, photographs. 'Lost in the War' is often a vaguer term. Some, of course, were destroyed, but others, shall we say, 'vanished'. One day they may turn up, or it may be that someone will recognize a photograph as something that they have seen more recently. It's very difficult of course; the war has been over for nearly forty years, and some things have passed through a number of hands, gaining 'good title' as they went, but even if there's no hope of Leipzig getting something back without the prospect of lengthy litigation, at least it would be useful to know where things are today or to be able to recognize them if they ever were to appear again.

One thing I should have said earlier: Dr. Henkel asked me to point out that three of the plates in his Clavichorde volume are upside down: plates 44 lower, 46 lower (which shows the keyfronts of no.1) and 60 upper. But don't let that be enough to put you off; they really are first rate.

Another Catalogue, this time of the International Brucknerfest this autumn. The second half of this Catalogue is outside our orbit, though it includes some interesting correspondence, photos of manuscripts, and so on. The first half is fascinating. Were these instruments really still in use in Bruckner's time? There are five- and six-key clarinets, a ten-key bassoon, a natural trumpet and a hand horn. The violins, as one would expect by the first half and middle of the 19th century, are in modern state. I must have another look at some Bruckner scores and see whether he could have been thinking in these terms. But I imagine the real purpose was to show what Bruckner was brought up on. He was born in 1824, and most of these instruments date from around that time and the following decade or two. These are the sounds that he heard as a boy and as a young man, and these are the instruments that first inspired him. It is a novel approach to the study of a composer, and one worth pursuing with others; one also that is worth further study: to what extent can one trace the influence of the sounds heard in youth in the mature music? With some composers certainly; the hand horn is always there in Brahms's writing, the key trumpet in Verdi's, and so on. Meanwhile, there are excellent photographs, including a number of details, here of early 19th century instruments made in Linz and gathered together from a number of private and other collections.

(from p. 25)

The procedure was thought out by epistemological critics of today's philosophy of copies, and based in dimensions of observation that are closer to music and woodwork. Modern, chemical knowledge of wave-physics and Gas physics allowed me to discard the acoustical approaches to woodwind instrument function given by several authors, (Arthu* Benade, C. Nederveen etc.) which bases analysis in a classical, linear elastic model, and later measurements have shown strong sound-dispersion & non-uniform sound speeds in the frequencies of the harmonic overtones. Deviations are plus and minus in the same sound structure and often contrary to what's expected from classical argument of the influence of resonator conicity. It's also confirmed in cylinders.

One has got to do with so-called unlinear acoustics, a non-linear behaviour of the elasticity module of air, or said in other words, the overtone spectrum of sound is a molecular spectrum of air having a quantum mechanical end-condition at the heat-reflecting barrier.