No. 28 July 1982

FOMRHI Quarterly

BULLETIN 28 and SUPPLEMENT

BOOK NEWS

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419 Blown Resonance of Baroque Flute-Transverso, IV The Tone and the Blowing Process. F. Raudonikas.


REVIEWS


FELLOWSHIP OF MAKERS AND RESTORERS OF HISTORICAL INSTRUMENTS

Hon. Sec. J. Montagu, c/o Faculty of Music, St. Aldate's Oxford, OX1 1DB. U. K.
We start, for once recently, pretty well up to time; whether we can get this to you before July is out I'm not sure. It will depend on our printer's holiday plans, and even more on Djilda's arrangements because, please note, Djilda, Eph and NRI are moving to:

5 Needham Avenue, Chorlton, Manchester M21 2AA; tel: 061-881 2134

If she's moving that lot (and two kids), then there may be delays in getting this out to the printer. Anyway, please make a note of the new address for any Comms etc that you send direct to her.

POSTING FoMRHIQ: We are still having problems with this. When I was in Sweden last month, I found that Cary Karp had received his Q by surface (he pays for airmail), even though it was stamped LETTER in large letters. Do any of the rest of you have this problem? It's difficult to tell, unless the date on the postmark is legible, as you don't know when it was posted, but if you can read the date, please let us know if a Q that should have gone by air takes more than a week or ten days. Not that I know what we can do about it, except perhaps use airmail stickers (which they tell us not to do!) on copies for Europe. Some of you don't get a copy at all, but that's the post office; they always manage to lose one or two (I can't imagine how; they all have a return address on them), and we can only apologise for them and replace them as soon as you tell me. Do tell me, please; one poor chap (also in Sweden) had had nothing at all since October and didn't tell me till I met him there. I suppose the answer is to give us about 6 weeks from the beginning of the month (ie about 4 weeks to be late and two weeks for postage) for air, and a couple of months for surface. Sometimes we are later than that (eg the last two issues) but if you don't get your Q by the end of the month after the dateline (ie end of August for this one), something is going wrong.

LEGIBILITY: Paul Gretton sent:

Improving the legibility of FoMRHIQ contributions

Members might like to compare my article on pp. 13-18 of No. 26 with any of my previous attempts, for example pp. 45-52 of No. 24. They, like this note, were all typed on the same non-electric portable with the same fabric ribbon. The considerable improvement in blackness in No. 26 was achieved by simply sending Jeremy not the original typescript as I had always done previously, but the photocopy which I usually have bound in full morocco and gold for my archives. The result when reproduced by offset in FoMRHIQ is a pretty fair imitation of electric typing with a plastic ribbon. The photocopy must be a really good one, done on a quality machine that gives high contrast. I get it done at a local jobbing printer's shop or at the university library.

Several members commented on the little dots for the title page and Eph's articles in the last Q. I had a word with Djilda about it and she said that they've now got a different word-processor which runs the dots closer together and she (and I) hope that this Q will be better in that respect. The last one did look a bit as though the mice had been at the print.

FURTHER TO: Bull. 27 p. 6: I said that Paul Mosby's West Dean courses looked a bit pricey. Donald S. Gill wrote to say that courses there are very good value for money, even though the prices do look high. The accommodation is good and the food is superb, he says.

Bull. 27 p. 7: I made a remark in passing on oboe bores. Paul Interin writes: "I definitely prefer a smooth oboe bore, i.e. as
David Owen writes:

In reply to Paul Kemnott's query (end of Bull. 27, p?) as to how cylindrical bores are/were smoothed (in, say, renaissance flutes).

1. Dealing with present day possibilities. It is possible with properly designed 'D' bits to produce a bore finish which is good enough not to need reaming. (This could be the subject of a Communication(?)). However, assuming a bore has been produced which does need reaming, this can be done by various methods ranging from a very simply constructed 'flat' reamer on a long enough shank to pass along the length of the required bore; or better still if you want to ream bores of many different sizes obtain 'Narex' adjustable reamers. These are available in different sizes and are infinitely adjustable within limits, it is/was possible to obtain them to cover bore sizes from 10.25 mm to 33.00 mm. They are obtainable from Tilgear, 8-12, Windmill Hill, Enfield, Middx. EN2 6SA. The shanks are short so it is necessary to adapt the ends to fit longer shanks when they are used for e.g. renaissance flutes. They are capable of producing a 'mirror' finish in hard woods such as box, blackwood etc. and a very smooth finish in maple, pear etc.

2. When the bore surface in examined of museum specimen of renaissance flutes, it is frequently possible to see spiral tool marks. The 'twist' of the spiral is often too coarse (as in some of the Verona flutes) to have been made by a 'D' bit that was removing any bulk of material, but may well have been made by a 'D' bit which was taking a "finishing cut" and was therefore penetrating fast in relation to the speed of rotation of the flute in the lathe. I strongly believe from documentary evidence that these flutes were bored on continuously rotating (not reciprocating) lathes with 'D' bits, certainly in the early or mid seventeenth century if not earlier.

He eric halfpenny's flute with the problem "integral wooden 'cork'".

Assuming this to be the case and assuming a flute to have been constructed by drilling a 'blind' hole it is no more of a problem to ream a blind hole than to drill one.

Leaving conical bores of reed instruments out of the discussion for the present, certainly experience shows that flutes speak more easily when the bores are smooth whether they are cylindrical or conical.

Comm.406: Paul Hailperin again: "As Cary says, the oils are very variable. I've seen linseed oil harden in a day or two, so 'in-use' instruments still need to be wiped off carefully."

GRANT AVAILABLE: I've had a letter from the Winston Churchill Memorial Trust saying that musical instrument makers will be one of the categories for the next round. What they say is:

Churchill Travelling Fellowships are open to all UK citizens of any age or occupation, and since no educational or professional qualifications are needed, they are of special interest to people who would not be eligible for other types of grants. (Churchill Fellowships are not normally given for academic studies).

The object of the awards is to enable those who would not otherwise have a chance, to gain a better understanding of the lives and work of people in countries overseas, and to bring back useful knowledge, skill and experience for the benefit of our community. About 100 awards are made annually, and there are now over 1500 Churchill Fellows.
Grants are offered in different categories each year; candidates whose trade, profession or personal interests are covered by any of them may propose a project they wish to carry out in whatever countries they choose. The only requirement is that applicants have to show that they can make effective use of the opportunity both while they are abroad and when they return.

The final selection for the next group of awards will be made by interview in London in January 1983. Successful candidates will be expected to start their travels during that year, making their own plans and arrangements within the scope of the grants. The grant will cover return air fare, plus all travel and living expenses abroad for a period of about two months.

To apply send your name and address only on a postcard between August and Kid October to the Winston Churchill Memorial Trust, 15 Queen's Gate Terrace, London SW7 5HR. You will receive an explanatory leaflet and a form to complete, which must reach the Trust Office by 27th October 1982.

I wrote to them, when I got this, because I had applied in the early days of the Trust and had an unfortunate response. I had wanted to go to India and received a strong impression, at the interview, that it was nonsense to suggest that we might be able to learn from these non-Europeans (to put it politely). I am assured "that there are no cultural limitations to our Travelling Fellowships. In the first instance they are awarded for originality and usefulness of project and in the final analysis to people of character and enterprise who are likely to be good representatives of this country and able to put into effect the information they gained on their Travelling Fellowships". So that means that they wouldn't bar you from going to see how a lute is made today, for instance (though I wouldn't suggest going to Lebanon at the moment!). If you think you're eligible, do write to them. They're open to all UK Citizens; there's no age limit; there are no special qualifications; they say the average stay overseas is eight weeks, and all expenses are paid.

SOUND BOARDS: George Bowden writes:

Some time ago there was discussion in the bulletin about why sound boards should be cut with the grain at exactly 90 degrees, or perfectly "edge grain".

I have cut a lot of soundboards here from Western Red Cedar logs. There are two things guitar makers I have known look for in their soundboards.

The first was stiffness felt when holding the board in the hands on either edge, flexing the board to test its stiffness. I repeat holding the board at the two edges, not the two ends, the grain running from end to end. Some boards or tops being very floppy were rejected for good quality guitars and others which were surprisingly stiff, being of the same wood, were selected.

Other guitar makers just looked at the board and if they saw the "cross flower" (I believe this is the name for it in English) this was selected.

The stiff boards were always with the grain perfectly at 90 degrees and also the boards or tops which had the "cross flower" had the grain at 90 degrees, if the grain was not 90 degrees or edge grain then the boards were floppy or not stiff.

The cross flower I take to be the medullary rays which are visible when the cut slices them their full length, or at 90 degrees to the grain.
To get this appearance and quality one has to keep taking off wedges of wood from the block being sawn in order to keep the grain vertical which is very wasteful. A process not popular with sawmills resulting very expensive. It certainly cost me a lot of money in time to get good guitar tops.

Another odd occurrence is that some guitar buyers don't like the appearance of tops showing the cross flower as it absorbs the colour unevenly, they consider it ugly. All I can say is "take a look at some of the famous guitars".

I hope my explanation can be understood, it is rather difficult to explain. I don't write much as I feel that what I have to say is probably already known. If so please forgive me for wasting your time.

**MATERIALS:** George Bowden again:

Copal varnish. Some time ago I enquired if anyone knew where to get the real stuff but we had no replies.

I have now found a supply of Copal but need a recipe for making a varnish with it. The main ingredient must be copal so that it will be very flexible I understand.

If any members know how to make Copal varnish I would appreciate the recipe.

Probably the members all know about this firm but I have just found it and they seem to have a wide range of materials for varnishing. Also they can write in English and have a catalogue in English. In case it is of interest I give the name and address:-

Adler Drogerie,  
Josef Hammerl KG  
8523 Baiersdorf  
Hauptstrasse 18  
Postfach 9  
West Germany.

Woods: W. & C. Marshall Ltd of 2 Drysdale Street, Kingsland Road, London N1 6NA, tel:01-739 8236/7 have stocks of exotic hardwoods, purchased from manufacturers of musical instruments, including rosewood, cherry, cedar, sycamore, ebony, lime, walnut and hiedua and would be happy to welcome customers; their letter is dated 7th May.

Donald S. Gill sent me a copy of his letter to Ronald Peel, who asked for wood suppliers in the last issue. His lists the following firms who have specifically mentioned exotic woods in their advertisements in the Woodworker magazine recently:

North Heigham Sawmills, Paddock St (off Barker St), Norwich NR2 4TW

Robbins Ltd, Merrywood Mills, Beelminster, Bristol

Chart (phone no only) Reading (0734) 695336, evenings & Saturdays

Timberline, 1a Langton Road, Tunbridge Wells, Kent (Donald has bought from them). And two who advertise wood for musical instruments:

A. Highfield & Co, Rosewood House, Bridge Road, Downham Market, Norfolk

Touchstone Tonewoods Ltd, 27 Lesbourne Road, Reigate, Surrey

Finally a woodturner from whom Donald has bought small consignments:

Bruce Boulter, 12 Colview Court, Mottingham Lane, London SE9 4RP.

Jeff Hildreth (new address in Supplement herewith) "can supply an extremely rare wood in small quantities for frogs, pegs, etc. Known in the USA as 'mountain mahogany' it is not a mahogany but a shrub growing to a maximum of twelve feet in height. The wood is as dense as ebony without the brittleness".
beautifully and the nut-brown wood polishes nicely. Its proper name is Cercocarpus Ledifolius."

James Crabtree of Acoustic Timbre Co, 2314 Adanac Street, Abbotsford, B.C., Canada V2S 4S9 sent:

We're writing to inform you of a supply of excellent musical instrument wood. As an example, we have high grade Alaskan Sitka Spruce, eighteen rings per inch or better, dried to eight percent humidity, very white wood and the end grain slope is not more than seven degrees. Because we use specialized, exclusive log handling equipment, end grain is usually ninety degrees. All of the musical instrument wood is chosen from millions of board feet of high grade lumber.

Our supply of quality woods include book matched sets of:

Order #
1. Guitar top, master grade sitka spruce (22" x 8 1/2" x 3/16") $14.00
2. Guitar top, number one grade sitka spruce (22" x 8 1/2" x 3/16") $12.00
3. Guitar top, master grade red cedar (22" x 8 1/2" x 3/16") $13.00
4. Guitar top, number one grade red cedar (22" x 8 1/2" x 3/16") $11.00
5. Lute top, number one grade sitka spruce (9" x 26" x 1/8") $13.00
6. Lute top, number one grade red cedar (9" x 26" x 1/8") $11.00
7. Mandolin top, number one grade sitka spruce (6' x 16" x 3/16") $8.00
8. Mandolin top, number one grade red cedar (6' x 16" x 3/16") $6.00
9. Dulcimer top, number one grade sitka spruce and red cedar (32" x 4" x 3/16") $3.25
10. Hammer Dulcimer top, number one grade sitka spruce & red cedar (36" x 18" x 3/16") $11.00
11. Minstrel Harp top, number one grade sitka spruce, all horizontally book matched pieces (38" x 10" x 3/16") $14.00
12. Renaissance Harp top, number one grade sitka spruce, all horizontally book matched pieces (56" x 12" x 3/16") $23.00
13. Sitka spruce brace stock (2" x 2" x 24") $3.50

When ordering wood, please include shipping address, order number, quantity, type of wood, payment, shipping cost (see below) and insurance if you wish: ($1.00 for $100.00-$200.00 coverage per package of 15 or less taps).

Shipping Costs:
Order #1 through #11 $3.50 first set; $2.00 each additional set
Order #12 $4.50 first set; $3.00 each additional set
Order #13 $1.50

*For orders exceeding 15 sets, please include an additional $2.50.

Materials in General: Mark Norris (new member in Supplement here-with) has sent me some copies of Ian Firth's Directory of Suppliers to Craftsmen Musical Instrument Makers, which I mentioned in a Bulletin back in 1976 when it first came out. He feels that it should be updated and would ask everybody's help in producing new names for it. He has sent copies to everyone who exhibited at the Horticultural Hall last year. Anyone else, or the first five of you, who haven't had copies and would like to see who is in it and who would be willing to send in new names quick, is welcome to write and ask me for a copy. I will, of course, let you all know when the new edition comes out.

GADGETS: David Owen sent me details of a Probelight, which looked so useful that I ordered a couple for myself, one for the Bate and one for me. It is indeed useful and in the week I've had it, two visitors have found it very handy for examining instruments. What it is a small torch (American flashlight) with two AA batteries (pen-torch) with a single 2mm diameter flexible plastic fibre optic. Because it is monofilament it works much better than the bundle of fibres on an American one I bought ten years ago. Th fibre is 1mm long and can, of course, be cut shorter, though it's not so easy to change your mind and join it up again. It is distributed by Messrs Rollaben (S.E.S.) Ltd, PO Box 7, Sandbach, Cheshire CW11 OPT and costs £3.99 plus VAT plus £1 p&p (which would cover up to five of
them, and if you get together and order ten, you can have a 10% discount. Overseas, they cost £4.00 each, but there's no VAT to add; postage is £1.50 to Europe and £2.00 further afield, again covering up to five of them. They don't allow discount for overseas customers, unless it's an agent who'll order large quantities. They would like cash with order, and I recommend the thing highly. I should have said that they don't supply batteries. The one thing that I didn't ask them was what they would charge for extra fibre optics without torches if you want a selection of different lengths, but since you don't lose light from the sides of the fibre, it's probably as easy to keep the full length.

I have made a rigid light probe, which may interest you. It's simply a piece of perspex rod fitted into a rubber spark-plug cover (obtainable at any motor spare shop) and fitting over the top of a pen torch. If the sides of the perspex are polished (Brasso does it well) no light escapes; the tip is left unpolished and the light therefore comes out there. Useful for poking in a fingerhole while peering down the bore, but of course you can't bend it (except semi-permanently with heat), so for a lot of jobs the Probelight is much better.

While on such subjects, it seems from various conversations that while most of you have pitchmeters like the Korg which give the variation from equal temperament in cents, not everyone knows how to convert that into Hertz. Eph taught me how, years ago (see Comm. 21), but a quick recap might be useful: You need a pocket calculator with logs. You need to know that there are 1200 cents in an octave. Say that you play a G, which comes out 40 cents flat. G is 200 cents below A, 200 from 1200 is 1000, and you're 40 flatter, so that's 960. Divide 960 by a constant (3986.3137 for ordinary logs; 1731.234 for log n), take the antilog (for heaven's sake make sure it's the same sort as the constant; the constant for one and the antilog for the other leads to chaos) and multiply by 220; the answer is then the Hertz for that note. If you want the A for that pitch, as quick a way as any is to multiply the result (383) by 12th root of two twice, giving you 429.9. Wonderful things we carry in our pockets today.

PLANS ETC.: Hubert Keller is just back from France. He has sent a two-page list of instruments from a museum in Marseille and a new list from the Paris Conservatoire of their plans; there are four new ones, and there'll be a fifth (of the Voboam E.2087) later this summer. See further on in this Q for the list and the list of plans.

I have got a complete set of the plans produced by the Stockholm Musikmuseet. There's a list of these further on, too. For the moment the plans are here, at the Bate, and anyone who wants to see them, to find out whether they want to order them, is welcome to come and look at them. They are not for copying. I'm not sure whether they are supposed to wind up with Eph & Djilda or with NRI Design Library; I'll have to sort that out with Djilda, but for the moment they're here and will probably stay here till they've sorted out their move.

QUESTIONS: Jeff Hildreth (new address in this Supplement) asks if anyone knows where he can get Brazilian rosewood in boards or logs.

He is also still looking for information on bows and on the nyckelharpa. I remember last time he asked referring him to Jan Ling's book The Nyckelharpa (published by the Stockholm Musikmuseet) and I'm not sure what else he wants to know; the information in that is pretty complete.

George Bowden is trying to identify a guitar (see next page; the photo he sent may come out).
and a Canadian friend of George's had a memory of seeing something similar in a picture of the Moscow Guitar Society in 1915. Anyway, George would be grateful for any information about the instrument and in particular for any location of one in a museum or other collection which he could study, since it could be possible to make a much improved version of the Spanish 10-string guitar on these lines. He has seen something like it, bought and perhaps made in Italy, which had the big bass extension but which did not have the arch joining the bass side to peg-box. Any gelp or comments would be gratefully received.

Marc Champollion (new member; address in this Supplement) has three questions:
1) has anyone any experience or information about bass strings for harpsichords made of silver, gilt silver, gold or platin?
2) What happened to that clavichord/spinet (Comm.370)?
3) Does anyone have measurements and pitch tables of ivory one-keyed Cahusac flutes or wish some? We have three Cahusac, two of them of ivory.

OTHER SOCIETIES: NEMA (The National Early Music Association) had planned to hold its first AGM this month, but rail strikes have made this difficult, so it'll be in September some time. This will be before our next Q appears, so if you're interested and haven't yet joined and are not sure that you will see a notice of it (the date isn't fixed yet or I'd tell you), write to Francesca McManus and ask her to let you know. Whatever the AGM decides about subscription rates, those who join now can do so at the initial rate of £10, and if NEMA is to be the successful umbrella group for all of us, both as individuals and as societies like FoMRHI, Galpin and all the rest (and for playing groups), that it could and should be, it is going to be important for all of us to join. NEMA could be the organisation to bring pressure to bear on all sorts of bodies (eg those that dispense funds and provide opportunities for more performance, training and everything else) but it will only be able to do so if it can speak for all of us in the same sort of ways that the CBI can speak for all major industries and all the other big trade associations do.

The Ruckers-Genootschap is starting a series of publications called Mededelingen van het Ruckers-Genootschap (with English summaries). The first volume will be out soon and will be on the genealogical tree of the Ruckers/Couchet family. Cost per issue is 140 Belgian francs (120 for members of the Genootschap) plus 120 Bfr postage abroad (which includes bank conversion costs) or 20 in Belgium. Their address is Vleeshouwersstraat 38-40, B-2000 Antwerpen, Belgium.

Lawrence Brown says that he has been elected to the Board of Directors of the Guild of American Luthiers. Like us, the function of the GAL is information-sharing and they produce a large number of data sheets. We were going to reprint their list of them in Q 24, but there were snags: it was too faint to print from, it was an odd size in relation to our page size and it was already very small print which would probably have come out too small to read. If they can send us a darker copy we might have another crack at it; meanwhile, if you're interested, write to Tim Olsen, 8222 South Park Avenue, Tacoma, WA 98408, USA, and have a look at Bull.24, p.7.
COURSES: The Centre de Musique Ancienne (6 rue Charles-Bonnet, CH-1206 Genève, Switzerland) are running a whole string of courses over the next academic year, mostly playing various instruments (shawm, recorder, traverso, oboe, violin, viol, lute, cello and keyboards, all baroque and/or classical), singing and dancing; they seem mostly to be spread out (eg every Thursday, or six weekends and so on), but if you're within reach and interested get in touch with them.

The Istituto Musicale Comunale, I-12097 Pamparato (Cuneo), Italy, have as usual sent me a notice of this year's courses on playing and making various instruments too late to be any use to you, but it's worth writing them, if you're interested, in the hope that they will tell you next year soon enough for you to apply. They play most things and make harpsichord, clavichord and lute.

EXHIBITION: There is to be a Semaine Internationale de la Musique at the Grand Palais in Paris next March. Their "ambition is to assemble, on the very top-level, all the different branches involved in music: Music publishers, Musical Instrument Manufacturers..." etc etc. They didn't enclose the form to be returned, so I don't know what, if anything, they are charging exhibitors, but if you're interested, write to J.P. Jouet or Jessie Westenholtz at Soditec, 62 rue de Miromesnil, Paris 75008, France.

CIMCIM CONFERENCE: I told you in the last Bulletin that I was going to this last month. It was a very successful conference. We started in Oslo (Norsk Folkemuseum), went on to Trondheim (Ringve Museum), then to Stockholm (Musikmuseet and Stiftelsen Musikkulturens främjande) and wound up in Copenhagen (Musikhistorisk Museet & Carl Claudius' Samling, which are now combined). The idea was to study exhibition and display techniques in the various museums, and it was sufficiently hard-working that there was very little time to make any notes of the instruments that one was seeing. All have instruments worth seeing, but bear in mind that on a casual visit you won't see what's in the stores. From that point of view, it's particularly important to make previous appointment at the Stockholm Musikmuseet, which shows only a small part of its collection, and the Stiftelsen Musikkulturens främjande (which is often not open at all); for the former, get in touch with Cary Karp and for the latter with Göran Grahn (new address in this Supplement).

Ringve has most of what there is on show (there's a new edition of the catalogue that Peter Andreas Kjeldsberg was going to send me for review but he hasn't yet). Copenhagen has a vast amount on show and it's a superb collection; they used to be members but dropped out. I think because the October Q went straight into the library and nobody noticed that it had the renewal form in it, and they may well renew. Their address is Aabenraa 30 and be careful; they are closed on Monday and whichever day Torsdag is; other days they are open from 1 to 4 pm, except Onsdag, which is 10-1. The curator is Mette Müller. Obviously if you want to do anything more than walk round looking at any of these museums (or any other) you have to write in advance.

BATE COLLECTION: We are gradually getting straight; all the brass and percussion is set, though it's not all labelled yet. Woodwind will get started as soon as I've finished this. I shall be here right through the summer, getting it finished (I hope), but do ring up before you come (unless you're coming to Oxford for other reasons)
a) because I shall take the odd day off here and there, particularly if the weather's nice (1), and b) because we shall have the builders coming in to dig up the floor at some stage (I hope - if not we won't have any heating next winter either). I am now following the example of a lot of other museums: if people measure things here, I do expect to xerox their notes before they leave.
grateful to receive a finished copy of drawings or measurements, especially if I am permitted to copy the result for others (I don't insist on this, but I do my best to; the point is that it doesn't do instruments any good if they are measured again and again, and so if the measurements we've got are adequate, it does help to preserve the instruments for the future).

DEADLINE FOR NEXT ISSUE: 4th October here, please, for anything for the Bulletin, with a margin of up to a week later for Comms that are sent straight to Djilda, but only if they are sent to her new address on the first page of this lot (or as in the Supplement herewith).

FINALE: (and ah out time too) That's the lot unless anything else comes in tomorrow while I'm doing the Members List Supplement. Have a good summer.

Jeremy Montagu
c/o Faculty of Music
St.Aldate's
Oxford OX1 1DB

PS One thing I meant to say: this issue will be a bit thin, I think, though not as thin as the last one would have been if Eph hadn't wanted to play with his new word-processor. The thing is, if you don't write it, we can't print it. So, if ever you think that you aren't getting as much for your sub as you should be, the remedy is in your hands; the more you write, the better money's worth everyone else will get, and if they write too, you'll benefit as well.

BULLETIN SUPPLEMENT D.S.

The Early Guitar, one day seminars Sunday 31st October and 7th November 1982.

For the fourth year, the Guitar Study Centre is organising two one-day courses on the repertoire and the performing techniques of the Baroque Guitar. The courses will take place in S.E. London and will be directed by Harvey Hope. Some of the remarkable guitars from his extensive collection will be on display to illustrate the developments in construction which took place during the 17th. and 18th centuries, and the difference in tonal quality between early French, Italian, and German guitars. Amongst these instruments will be two Voboams - the earliest known example by Alexandre and the other by Jean; a magnificent ivory and tortoiseshell guitar by Joachim Tielke; and a guitar which recent evidence suggests may be a hitherto unrecorded example from the Tielke workshops. Some instruments are unrestored with their backs removed. A wide selection of 18th. and 19th. century guitars by makers such as Pages, Panormo, Fabricatore, Lacote etc. will also be on view. A number of makers and restorers have attended these seminars, held since 1979, and it is hoped this year that one of the days can be arranged as a 'makers workshop'. The course fee of £12. includes a ploughmans' lunch with wine. Full details from the Course Secretary, Guitar Study Centre, 64 Ashmore Grove, Welling, Kent. Please indicate if your interest is primarily that of maker and restorer.

NOTICE OF CHANGE OF ADDRESS

In May I closed my shop at 202 Wadison Road and moved to a larger space at 3952 Brotherton Road. The phone number has been changed to (513) 271-6336. Please continue to use my home address for all mail: 3605 Shaw Avenue, Cincinnati Ohio 45208. The events which precipitated this move are as follows:
My shop was located on a street with other craft-oriented businesses, antique shops, and art galleries. Inevitably, the area became a popular shopping district, and began to be exploited by greedy landlords and entrepreneurial developers. In April, my lease expired and I found that the landlord wanted an astronomical sum for rental. Unable to re-negotiate the lease, I vacated the premises.

This happened at a fortuitous time for me. I had recently been approached by another professional builder of early instruments, Ben Bechtel, who had found a large workshop for rent and wanted to share the space with me. The structure was formerly used by a printer, and is completely wired for machinery and power tools. With all maple floors and windows that look out over trees and gardens (instead of decaying buildings) it offers an ideal atmosphere for instrument construction.

I immediately moved my entire shop into the new space, and have spent most of May setting up. Although this means that I have lost a month or more of working time, I will soon make it up. The larger space has allowed me to set up much more efficiently. Additional workbenches and shelving space, a large varnishing room and spray booth, and a more organized shop will allow me to produce instruments much more quickly. This will hopefully shorten the waiting list, meaning some of my customers will receive instruments sooner than they had expected. Unfortunately, clients whose instruments were due in May, June, and July will find a one-month delay. I can only offer apologies for this delay.

I have often thought that the ideal situation for a luthier would be a loose consortium of instrument makers under one roof, sharing business expenses as well as the knowledge and experience of instrument-making. My association with Mr. Bechtel is a step in that direction. In addition to teaching music history at the University of Cincinnati for twelve years, Mr. Bechtel directed the collegium musicum and is a member of the professional touring and recording group Early Music Consort. He has been building instruments professionally on a part-time basis for six years. He has given up his University career to pursue instrument-making on a full-time basis. Mr. Bechtel is a member of FoMRHI.

Any FoMRHI member who happens to be in Cincinnati is cordially invited to visit the new workshop.

JM adds: Ben Bechtel is not a member of FoMRHI; he was a member for three years, but we've heard nothing from him since the end of 1979. This does arise occasionally (another ex-member said that he was a member in order to get access to the Trinity College harp) and is one reason that we have a List of Members. Those who are not in it nor a Supplement are not members, unless they joined very recently. Membership continues only as long as a member keeps up his subscription.

A late P.S. from J.M.:
I nearly forgot to say that the Bate Collection has re-started its Early Music Weekends. We had one last term on Wind Octets, and the next one will be on Flutes, on November 13th and 14th, with Stephen Preston. Basic format is some talk on Saturday morning, audience participation (i.e. playing) on Saturday afternoon, all in the Bate; then on Sunday an open rehearsal in the afternoon and concert in the evening, in the Holywell Music Room. I'd like to tie this one to a measuring and
making session with Robert Bigio, either the same Sunday morning, or the following weekend. If you're interested in any or all of this, and in future weekends on other instruments, let me know, and I'll put you on the Bate mailing list. There's also a mid-week quickie on Guitar with Harvey Hope on Wednesday November 10th - afternoon talk and demonstration of early guitars in the Music Faculty, and concert that evening in Holywell.

**MUSEE GROBET LABADIE**

_Instruments de musique_

1. Harpe diatonique en bois de cerisier sculpté, le fond sonore est décoré de motifs de fleurs peintes polychromes. Anonyme, XVIIIème siècle.

2. Archet de viole en bois et ivoire. XVIIIème siècle.

3. Pochette de viole d'amour en bois d'érable. La pochette est le nom d'un petit violon utilisé par les maîtres à danser pendant leurs leçons. La viole d'amour proche de la viole possèdent des cordes en laiton, Allemagne, XVIIIème siècle.

4. Lyritza ou pochette bateau en bois d'érable, France, XVIIIème siècle.

5. Plaque en bronze, portrait de profil de Nicolo Paganini par David d'Angers, 1834.

6. Centre d'une téorbe en bois tendre découpé. La téorbe est un instrument à cordes pincées, inventé par un musicien italien, Bardella, au XVIème siècle. Il possède deux têtes, une pour les cordes qui se doigtent sur le manche, l'autre pour les grosses cordes qui servent de basse.

7. Etui de guimbarde en buis sculpté, XVIIIème siècle.

8. Baton de chef d'orchestre en bois d'ébène et ivoire décoré d'une lyre en cuivre, XVIIIème siècle.


10. Flageolet en buis et corne, XVIIIème siècle.

11. Flageolet en buis clair, estampillé Michel, XIIIème siècle.

13. Flageolet en buis clair, estampillé A. Guerin, Marseille, XIXème siècle.


19. Pardessus de viole en cyprès, estampillé Bartélémy fecit à Marseille, 1704.

20. Petite viole d'amour en bois de cyprès et buis, fin XVIIIème siècle.


22. Alto en bois d'érable, XVIIIème siècle.

23. Guitare sarazine en bois avec des inscrustations d'os.

24. Mandoline napolitaine en bois de sapin avec des incrustations de nacre et d'ivoire, estampillée, Joseph di Maria di Napoli a di 1771.

25. Mandore en bois de sapin avec une plaque d'écaillle, Italie début XVIIIème siècle.


29. Cor anglais ou hautbois de chasse en bois, cuir et ivoire.

30. Guitare à cinq cordes doubles en bois d'érable, décorée d'incrustations de nacre et d'ébène, début XVIIIème siècle.
### DIFFUSION DE DESSINS TECHNIQUES D'INSTRUMENTS DU MUSEE INSTRUMENTAL

Liste au 15 décembre 1981

| No. | Instrument | Description | Fabricant | Année fabrication | Montant | Prix
<table>
<thead>
<tr>
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<tr>
<td>1</td>
<td>LUTH à onze chœurs, Anonyme, XVIIe siècle,</td>
<td>E.540 C.156, diapason 680 mm, Pierre Abondance, 1976, 1980</td>
<td></td>
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<td>2</td>
<td>GUITARE à cinq chœurs, Anonyme, Italie (?), XVIIe siècle,</td>
<td>E.30 C.263, diapason 725 mm, Pierre Abondance, 1975, 1980</td>
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<td>3</td>
<td>MANDORE à dix cordes, Anonyme, Italie (?), XVIIIe siècle,</td>
<td>diapason 355 mm, Pierre Abondance, 1976</td>
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<td>4</td>
<td>VIOLE DE GAMBE (basse), six cordes, Henry Jaye, Londres, 1624</td>
<td>E.23 C171, diapason 670 mm, Pierre Jaquier, 1976</td>
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<tr>
<td>5</td>
<td>VIOLE DE GAMBE (pardeux), six cordes, Nicolas Bertrand, Paris 1714, E.1005 C.138, diapason 180 mm, Pierre Jaquier, 1976</td>
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<td>6</td>
<td>VIOLON Franco Lupot, Orléans, 1772,</td>
<td>E.899 C.19, diapason 193 mm, Pierre Jaquier, 1979</td>
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<td>100,00</td>
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<tr>
<td>7</td>
<td>ARCHETS (2 de violon, 1 de basse), Anonymes, France et Louis Tourte, Paris, milieu XVIIIe siècle,</td>
<td>E.0165, E.0199, E.406 C.65</td>
<td></td>
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<td>100,00</td>
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<tr>
<td>8</td>
<td>PIANOFORTE (carré), Anton Walter, Vienne, fin XVIIIe siècle,</td>
<td>E.976.3.1, 4 octaves + 1 note (mi-fa), Michel Robin, 1978</td>
<td></td>
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<td>150,00</td>
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<tr>
<td>9</td>
<td>PIANOFORTE (carré), Anonyme, Allemagne, ca. 1800,</td>
<td>E.954 C.356, 4 octaves + 3 notes (mi-sol), Michel Robin, 1978</td>
<td></td>
<td></td>
<td>150,00</td>
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<tr>
<td>10</td>
<td>EPINETTE DES VOSGES CO, France, XVIII et XIXe siècles,</td>
<td>BUCHE DES FLANDRES, Flandres, XVIIIe siècle,</td>
<td></td>
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<td>150,00</td>
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<td></td>
<td>CITHARE, Allemagne, XVIIe siècle,</td>
<td>Pierre Abondance, Pierre Jaquier, Michel Robin, 1978</td>
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<td>150,00</td>
<td></td>
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<tr>
<td>12</td>
<td>CLAVECIN à un clavier G1 c3, Carolus Grimaldi, Messine 1703</td>
<td>Michel Robin 1981</td>
<td></td>
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<tr>
<td>13</td>
<td>CLAVECIN à deux claviers F1 f3</td>
<td>Jean-Claude Goujon, Paris, vers 1749 - Joachim Swanen 1784</td>
<td>Michel Robin, Pierre Abondance 1981</td>
<td></td>
<td>2 dessins techniques + notice</td>
<td>250,00</td>
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<tr>
<td>14</td>
<td>EPINETTE EN AILE D'OISEAU F1 sans F1 f3</td>
<td>Jean-Claude Goujon 1753 - Abbé Tapray 1789</td>
<td>Pierre Abondance 1981</td>
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<td></td>
<td>180,00</td>
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</tbody>
</table>

**N.B.**

Les adhérents à la Société des Amis du Musée Instrumental bénéficient de 20 F de réduction par unité.

Ce document ne constitue en aucune manière un bon de commande. Celui-ci vous est adressé par ailleurs et comporte le montant des frais d'envoi qui vient en sus.
PLANS AVAILABLE FROM MUSIKMUSEET, STOCKHOLM

Clavichord, fretted, anon. Cat.no.NM 264 785a, drawn by Felix Wolff & Hans Erik Svensson

Clavichord, fretted, Anders Wahlström, 1732, drawn by Felix Wolff

Clavichord, fret-free, anon, Cat.no.1812, -- -- ---

Diskant viola da gamba, Johann Harp, Copenhagen, 1730, -- ---

Hummel, Cat. no. NM 77200

Folk hurdy-gurdy from Hälsingland,

Silverbas nyckelharpa, 18th c, Cat.no.69/70B (2 plans) -- ---

--- ---- , Cat.no. 206 178a (2 plans) -- ---

Oboe,marked R.Haka, Cat.no. MM 155, drawn by Cary Karp

Copies of these plans can, for the moment, be seen at the Bate Collection but they may be sent up to NRI in due course; ring up before coming to check that they're still here.

Copies can be ordered from the Musik Museet, who will tell you the cost when you order them.

FoMRHI Book News

Jeremy Montagu

There's a new edition just appeared (1982) of John Henry van der Meer's Wegweiser durch die Sammlung historischer Musikinstrumente of the Germanisches Nationalmuseum in Nürnberg. Like the earlier editions it goes round the collection, case by case, but it's quite a bit longer and has better photographs, some of them in colour. I don't know the price I'm afraid.

Just arrived is Barra Boydell's The Crumhorn and other Renaissance Windcap Instruments, published by Frits Knuf at Hfl (Dutch guilders) 140 for paperback and 165 for cloth. No time to read it properly now, so review next time, but at a quick glance it seems comprehen­sive (description of all known surviving instruments, citations of all known literary references, descriptions of all known icono­graphic sources), clearly printed and well produced.

You may have seen something in the papers a few months back about the discovery of musical mammoth bones in a Palaeolithic settlement site in Russia. Anatoly Zajaruzny has sent me a book about these, S.N.Bibikov, The Oldest Musical Complex made of Mammoth Bones, published in Kiev last year. Since it is in Russian, I've not yet been able to puzzle any of it out, and we've not yet got the gramophone hooked up at home, so I've not been able to play the record in the back. If anyone wants a look at the book, it's here, and I will report further in due course. Meanwhile, my thanks to Anatoly for sending it; the initial press reports sounded so bogus that it will be interesting to find out more about it.
1.2: Errata for Bouwbrief 23. (hissing illustrations.)
1.3: Review of Die Dreileier. Handhabung und Spieltechnik. Zusammen-
estellt von Mitgliedern des Frankfurter Dreileierensembles 'Die
1.4: Review by Hugo van Veen of H.A.Kellner, Wie stimme ich selbst
1.5: Mention of Musikinstrumenten zum Selberbauen by Wilhelm
Erlewein, Ravensburger Freizeit-Taschenbücher Band 2. The author has
examined and compared European and American kits and courses. Available
from the author by transferring DM10,40 to Munich giro-centre,
account 180281-607, for W.Erlewein, Lärchenstr., D-8011 Zorneding.
1.6: Overeskontakt is reprinting the technical vocabulary Dutch/
English/French/German. Hfl 7.50. Contributions requested in the
form of lists relating to subscribers' own fields.
1.7: Substantial article on the tuning of violin bellies by Harry
Wetsloot.
1.8: Detailed instructions for building a carillon practice-keyboard
are available for Hfl 15 from Laura Meilink-Hoedemaker, Terbregse
Hechter Rottekade 173, Rotterdam.
1.9: Construction drawing for a small spinet is available for Hfl 35
from Theo de Haas of Haarlem. (No address given.)
1.10: Drawing of bentside spinet by Thomas Hitchcock, London ca. 1710
available from the Smithsonian Institution.
1.11: Catalogues of kits for organs, strings, winds are available
from Orgelbaumeister Hofbauer, Abteilung Tonstube, Am Mehrdrusch 20,
8-5951 Lahntal-Gossfelden, West Germany.
1.12: 22 buys you a catalogue of harpsichord parts from Hecksher and
Co., 75 Bayham Street, London NW1 OAA.
1.13: Catalogue of tools and materials for guitar builders and
repairers from Robbert de Vos, Akkerwende 1, NL-1689 NS Zwaag, Netherl.
1.14: Wood-buying trip to Mittenwald. To order,contact Vereniging
voor Huismuziek and send Hfl 1,50 for "Katalogus Fuchs".
1.15: Illustrated article on making extra-long drills from silver-
steel rods. Looks useful.
1.16: Making a baroque trumpet, part 2, by G.J.van der Heide.
1.17: Further comments on articles 8.3 and 9.4 in Bouwbrief 22, Sept, 81.
1.18: (and loose centrefold of this Bouwbr.) Comparative table of
various systems of measuring piano string gauges.
1.19: Help requested with the fretting of dulcimers, mandolins etc.
Herman Willemse, Mercuriusstraat 5, NL- 5694 TA Breugel, can
supply computer-produced fretting diagrams for any string-length.
1.20: Kornelius Götz recommends highly the lute-building courses
given in Erlangen by Robert Lundberg and Dieter Kirsch. For info.
write to D.Kirsch, Eibelstätter Weg 14, D-8700 Würzburg-Rottenbauer.

If you want any of this stuff, write to the Hon.Sec. (Requests sent
to me are immediately fed to the goat. PG)
When making lutes by any construction technique it is useful to know in advance what shapes the ribs should be, both as an aid to construction and to save material. For lutes of "semicircular" end view all the ribs have the same shape and it is straightforward to work out what the shape should be. However for "flattened back" or "humped back" lutes the ribs have different shapes and it would be a more tedious job to work them all out by hand. A computer program has therefore been written to calculate and draw accurate lute rib shapes for flattened and hump-backed lutes given only the belly profile and the end view.

The belly profile is specified by measuring the half-width of the sound table at 1 cm intervals along the length of the lute starting from the clasp end as shown in fig.1. In order to get a better reproduction of the profile near the clasp additional measurements are needed at 2 mm intervals for the first 1 cm. The width measurements are shown by \( w_1, w_2, w_3 \) etc. in fig.1.

Left-right symmetry of the lute shell is assumed so only one half of the belly profile needs to be specified. The end view is given by the radial measurements \( r_1, r_2, r_3 \) etc. as shown in fig.2.

The program assumes that each rib occupies an angular segment of \( \frac{180}{n} \), where \( n \) is the (odd) number of ribs. The degree of flattening (or humping) at every point along the length of the lute is assumed to be the same as the flattening (or humping) in the end view.

The program calculates the widths of the ribs at points along their lengths by geometrical formulae and then draws the full scale rib shapes for one half of the lute; the rib shapes for the other half are simply reflections of those in the first half.

Only a brief description of the procedure is given here since this is not a journal of computing.

The program calculates the widths of the ribs at points corresponding to the 1 cm intervals along the length of the lute; these points will be called "measurement points". Since the ribs can be asymmetrical it is necessary to calculate two half-widths, \( h_1 \) and \( h_2 \), at each measurement point, the half-widths being measured from a straight line joining the two end points of the rib when laid flat. The straight line joining the two points of the flat rib will be called the "apparent centre line". In the case of a symmetrical rib the apparent centre line lies down the middle of the rib, fig.3a, whereas in a crescent shaped rib the apparent centre line lies outside the rib, fig.3c. If we now imagine bending the rib to its correct shape the apparent centre line will bend to a profile which is similar to the belly profile but scaled in the radial direction (radial here means radial in end view).

Fig.4 shows end views of the ribs shown in fig.3. From the geometry of the triangles in the end view one can obtain the scaling factors to calculate the profiles of the rib edges and the apparent centre lines from the belly profile.

The computation proceeds as follows:-
1) For each edge of each rib calculate and store the curved profile which is derived from the belly profile by scaling it in the radial direction by $r_i/r_1$. Here $i$ denotes the number of the rib edge.

2) For each rib calculate and store the profile of the apparent centre line which is derived from the belly profile by scaling by the ratio $r_0/r_1$. (see fig. 4).

3) At each measurement point on each rib calculate the distance $d$ from the clasp end measured along the apparent centre line. This is done using the profile of the apparent centre line.

4) At each measurement point calculate the two half-widths $h_1$ and $h_2$ using the rib edge profiles and the geometry of fig. 4.

5) Using the stored values of $d, h_1$, and $h_2$ plot the rib shapes.

Figure 5 shows an example of the output of the program for a lute of rather exaggerated flattening in order to demonstrate the different rib shapes and the need for crescent shaped ribs in this case.

I have not yet made a lute using the results of this program but I have cut out the ribs in paper and stuck them together edge to edge and they do indeed form a lute shaped shell, so I believe the program works correctly.

If anyone wishes to know what their rib shapes should be I will be pleased to run the program and post them the full size rib drawings. Simply send to me the following data which can be prepared easily from your plans:

1) The total number of ribs.

2) The belly profile in terms of the half-widths measured at 1 cm intervals along the length of the lute starting from the clasp end, with additional measurements at 2 mm intervals for the first 1 cm. In other words $r_1, r_2, r_3$, etc. of fig. 1.

3) The end view in terms of $r_1, r_2, r_3$, etc. of fig. 2. All in cms please.

If anyone does avail themselves of this service I would be grateful if they could also specify what lute profile they are using so that I can build up a library of profiles.
Figure 1. Belly Profile Specification:

Specify $w_1, w_2, w_3$ etc.

$\{1\text{ cm intervals.}\}

$\{2\text{mm intervals for first 1cm.}\}$

Figure 2. End view specification:

Specify $r_1, r_2, r_3, r_4, r_5$. 
Figure 3. Ribs laid flat:

"Apparent centre line"

Figure 4. End views of ribs:
Figure 5. Computer generated rib shapes.

Rib Nos. Increase from middle to edge.
Bob Barclay, 1030 Innes Road, Ottawa, Ontario, Canada K1A 0M8; tel: (613) 998-3721 (Brass, M; all instrs, Cons).

Werkgroep BouwersKontakt, Utrechtsestraat 77, Postbus 350, NL-3401 CT Ijsselstein, Netherlands; tel:03408-85678.

Brian Butler, 40 The Esplanade, Wagga Wagga, NSW 2650, Australia (all instrs, M,R,Australian woods).

Stefan Czapski, 54 Ludovick Walk, London SW15 5LE, UK; tel: 01-876 3669 (lute, guitar; M,R,P).

John B.Dick, 22 Springfield Road, Stornoway, Isle of Lewis PA87, UK; tel: 0851-2500 x 59 (wind, R,C,P; fretted str, P).

Bruce W.Du Vé, An Spideal, Co.na Gaillimhe, Eire; tel: 009-83235 (bagpipes Uill, northumb etc, flutes; M,R).

Richard Earle, 41 Dewsbury Road, London NW10 1EL, UK.

Colin J.Everett, 47 Fentiman Avenue, Ottawa, Ontario, Canada K1S 0T5; tel:(613) 235-5710 (lute, racket, gamba; M,P).

Basil Foraud, until end of August: c/o Camoys Farm House, Barcombe, Peters Finger, Templeton, Narberth, Dyfed, UK.

John Groeneveld, Lot 12, Station Street, Drysdale, Victoria 3222, Australia.

Nancy Hirschfeld, Borneostraat 9, NL-2585 TR Den Haag, Netherlands; tel: 070-503909 (gamba; P).

Friedemann Hellwig, Blumröderstr. 17, D-8500 Nürnberg 30, West Germany; tel: 0911-203971.

Donald S.Gill; tel: Reading 873986.

Hans Olav Gorset, Nedre Aave 44, N-1300 Sandvika, Norway; tel:(02) 540441 (flutes, recorders; M,P).

Göran Grahn & Andreas Kilstrom, Stiftelsen Musikulturens framjande, Riddargatan 35-37, S-11457 Stockholm, Sweden; tel: 08/617171.

C.H.& K.L.Greaves, 10 Market Street, Rugby, Staffs WS15 2J, UK; tel: 08894-76161 (hpschd; M).

Donald G.Tegna, Reyershaag 13, NL-6228 HA Maastricht, Netherlands.

Bill Groeneveld, Lot 12, Station Street, Drysdale, Victoria 3222, Australia.

F Marco Tiella, Direttore dei Corsi di Liuteria, via Pastrengo 11, I-20159 Milano, Italy (italian hpschds, pos.organ; M,R).

Hugh Spencer, 267 Cordeaux Road, Mt.Kembla, NSW 2500, Australia (wind, esp.bagpp, organ, barrel-orgn; M,R).

Max Thoursie, Ribbings Väg 33, S-19152 Sollentuna, Sweden (flute, recorder; M,P).

André Verhoog, p/a Gasthuisstr. 13, NL-4161 CA Heuvelen L-H, Netherlands.
Katharina Walch, Rosslauer Strasse 8, DDR-7022 Leipzig, East Germany; tel: Leipzig 584698 (hpschd, bar flute; M,P).
Jürgen Weiss, Hornsche Str. 83, D-4930 Detmold, West Germany.
* Roland Wilson, Gr. Annenstr. 76, D-2800 Bremen, West Germany; tel: 0421/591743.
Richard Woods, 1143 W. North Shore Ave, Chicago, IL 60626, USA (irish & welsh harp, crwth, lute; M,P).

***

General Facilities

Conservation: Bob Barclay, Friedemann Hellwig

Museums: Nürnberg: Germanisches National (Friedemann Hellwig)
Stockholm: Stiftelsen Musikkulturens (Göran Grahn)

Woods: Brian Butler

Organological Index

All Instruments: Bob Barclay, Brian Butler, Friedemann Hellwig

String Instruments General: Gerrit van der Veer

Keyboards general: Gerrit van der Veer

Pianoforte: Marc Champollion

Harpischord etc: Marc Champollion Andreas Kilstrom Katharina Walch
Göran Grahn Mark Norris Greaves Bros Marco Tiella

Clavichord: Marc Champollion

Fretted Strings: John Dick

Lute: Marc Champollion Colin Everett Stephen Murphy
Stefan Czapski Patrick O'Brien Richard Woods

Guitar: Stefan Czapski Stephen Murphy

Cittern etc: Patrick O'Brien, cp

Bows: Allan Perry Crwth: Richard Woods

Violin: Allan Perry

Viola da Gamba: Colin Everett Naomi Hirschfeld Stephen Murphy

Harp: Marc Champollion, Mark Norris, Patrick O'Brien, Richard Woods

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Woodwind general: Gerrit van der Veer

Transverse Flute: Marc Champollion Hans Olav Gorset Katharina Walch
Bruce Du Vé Max Thoursie

Recorder: Hans Olav Gorset Max Thoursie

Organ: Hugh Spencer Marco Tiella

Racket: Colin Everett Bagpipes: Bruce Du Vé, Hugh Spencer

*** Marc Champollion, Haferweg 6, D-5902 Netphen 2, West Germany (harp, spnt, clavchd, vrgnl, M; pft, fl, C; lute, P; temperaments, res).

(apologies to him for missing his card earlier)
Some days ago, I got in my hands a copy of the "A New History of the Organ", by Dr. Peter Williams, (Faber Books, London). It is not my intention to review this book which I have not enough time to read. As a matter of curiosity, I searched for references to Portuguese organs, and found the instrument of the Braga Cathedral (which I just finished the restoration) mentioned among Spanish organs. A small reference is made to this magnificent instrument and the specification that is published is plagued with errors and misinformation. I found that this is a repetition of those published in his book "The European Organ", (London 1966). It was a pity that Dr. Williams who knows me personally, did not have the idea to ask my help (which would be given with pleasure) in order to put in print a correct information for his readers. I want, only, to give the specification to help readers to correct what was put in print.

Braga Cathedral - Gospel organ

Two manuals, eight pedal pull-downs connected to the lower short-octave of the upper manual. Upper manual plays the great organ. Lower manual plays the echo-organ and/or the "rucks-positive". Both manuals with 45 keys, lower short-octave, d61 to d65. Both manuals with divided registers: bass from d61 to d63, treble from d63 to d65. Organ with three departments - great-organ, echo-organ (partially enclosed) and "rucks-positive". The front pipes belong to the great, including the horizontal reeds. Obvious exception to the front pipes of the positive.
Great-organ

base registers (21 notes)

Simbala (Zimbel IV)
Resimbala (Zimbel III)
15° e 19° (15th, 19th II)
Composta 22° (22nd IV)
Nazardos (Nazard IV)
Dozena (Twelfth)
Plautado 26 (Op. diap.16')
8° Real (Octave 4')
Trompeta Real (Trumpet, inside 8')
Plautado 13 (Op. diap.8')
Clarin de batalha (Clairon, front 8')
Dulçaina (Dulzian, front 8')
Contrás (Op. diap.wood, 8' pipes for reinforcement of the lower short-octave)

treble registers (24 notes)

Simbala (Zimbel IV)
Resimbala (Zimbel III)
15° e 19° (15th, 19th II)
Composta 22° (22nd IV)
8° (22nd V)
Nazardos (Nazard V)
Dozena (Twelfth)
Plautado 26 (Op. diap.16')
Flautado 13 (Op. diap.8')
Trompeta Real (Trumpet, inside 8')
Clarin (Clairon, front 8')
Trompeta Magna (Trumpet, front 16')
Aboas (Oboe, front 8')

8 pull-downs, drum in d6, drum in sol, "Carrancas" left and "Carrancas" right ("carrancas" are human figures, one playing trumpet (left) and the other blessing the faithful with moving arm, sounding a reed in d6. There are no independent pipes connected to the pedals.

Echo-organ

base registers (21 notes)

Carrancas (see above)
Trompeta bastard (Trumpet 8')
Tenor (Tenor, reed 4')
Plautado violao (Stp. diap.wood 8')
Plautado 6 ecos (Stp. diap.metal 4')
Composta 15° (15th I)
Claron (Cornet IV)

treble registers (24 notes)

Clarim ecos (Clairon 8' encl.)
Cheremia (reed 8')
Corneta Real ecos (Cornet VI encl)
Flautado 13 ecos (Op. diap.8' encl)
Flauta doce (Chimney flute 8' encl)
Claron (Cornet V)

Sliding stirrup to operate the door of the swell box. Iron lever to put on wind the two nightingales.

Positive-organ

base registers (21 notes)

Flautado 6 (Op. diap. 4' front)
Octava (Octave 2')
Composta 22° (22nd III)
Simbala (Zimbel III)

treble registers (24 notes)

Flautado 13 (Op. diap.8' front)
Pifano (Gemshorn 4')
Composta 22° (22nd IV)
Simbala (Zimbel III)

This specification includes a total of about 2,400 speaking pipes. About 50 dummies are also in the front of the case, to complete the decoration. The organ, itself, was built by Frei Simon Fontanes, a franciscan monk, from the Compostela monastery. The architect and "entalhador" of the two magnificent cases (see Bibliotheca Organologica", vol. 50) was Marceliano de Araujo, a parishioner of the Cathedral and the painting and guilding was made by Manuel Furtado of Oporto. The Rev. Canon Rafael Alvares da Costa, of the Cathedral's chapter, supervised the whole job.

Famalicão, April 1982
Blown Resonance of Baroque flute-Traverso IV
The Tone and the Blowing Process

Going from players lips to edge of mouth hole, the air stream performs complex movement. Alternatively directing now outside, now inside the embouchure hole, jet comes into interaction with air column closed in the flute and induces the longitudinal oscillations in it. Oscillation frequency of air column is determined by its resonance properties, i.e. it couldn't be any. Similarly the jet by far not in any of its states could interact with air column in order to produce the sound.

John Coltman [1] has experimentally shown that the transit time, or the time of impulse traveling through the jet has decisive importance for the sound production. The fact is that the jet enters the flute at a given phase of air column oscillation, which somewhat lags behind the phase of air column oscillation at the moment that the jet has just started from the lips. The traveling time of impulse in the jet substantially depends upon air-jet velocity, while the amount of wave cycles of disturbance in jet, before it could come to the edge, depends upon "lip-to-edge" distance value. In other words, what will be phase with which disturbance in jet comes to the air column depends on the velocity outflow of the jet and the value of "lip-to-edge" distance. If the transit time coordinate with the period of resonator oscillation then a sound production takes place. When these values are totally incoordinating the jet can not act generatively and represents by itself the mechanism of losses.

When the coordination of transit time with resonator oscillation period is optimal, the sound with maximal (for given conditions) amplitude is generated and its frequency is equal to characteristic frequency of resonator. If we begin to decrease the jet velocity then frequency of sound will decrease and its loudness becomes lower until it proves to vanish. If the jet velocity is increased from the optimal one, then the sound frequency continues, to some extend, to increase, while loudness will not grow. When the stream velocity increases further, the hissing in sound will arise in which the sound is then likely to be dissolved. Then the moment comes when the sound production on given vibration mode brake off.

In simplified form, this is the implication of widebandness of flute tones. On one side it is caused by properties of jet whose parameters could be changed very arbitrarily, on other - by resonant properties of the instrument once and for all determined by the way it is made. Such combination of circumstances concludes in itself the promising possibility. We can do anything we like with the jet, while the instrument has no ability of doing anything. Consequently, changing the stream parameter we would have a possibility to reveal the instrument competence concerning its substantial playing features.

In this article the changes of flute-traverso tone frequencies due to velocity change of air stream coming from player lips should be considered. However, on one hand the stream velocity depends substantially on blowing pressure, and on the other pressure is more easily measured than velocity. Therefore in the article the blowing pressure values will be used. The frequency

Comm. edited by Ole Vang
measurements connected with one or other pressure values will be called p/P-measurements (in diagrams, accordingly p/P-curves).

The player on the flute-traverso controls simultaneously several parameters responsible for the transit time. Being advantageous from the point of view of expression possibilities of the instrument this fact complicates extremely the accomplishment of p/P-measurements on it. At the same time the problem of the present article is not more than an illustration of resonance band structure of flute tones. In this connection it is quite possible to replace the object, complicated for investigation, by an analogous one requiring less complex methods. The recorder is such an object. The dimensions and form of the bore as well as the character of some acoustical processes in treble recorders are quite similar to the ones of flute-traverso. Therefore the substitution supplies a good analogy.

The dimensions of labium and windway and their mutual placement in recorders are finally determined by making. Therefore all parameters responsible for transit time are fixed in it. The exclusion is air-jet velocity which is sole factor controlled by player, striving to get sound with certain frequency. (It is a widely spread opinion, that the player can influence the tone frequency by adjustment of mouth cavity resonance. Coltman /2/ has shown that in transverse-flute influences of this kind are practically eliminated by jet presence. Similar results have been obtained (although not explained) on recorder by N.Bak /3/.)

Such "insignificant" role of player permits, without damage for our problems, to replace him by a chamber hermetically connected with recorder mouthpiece. The chamber has adjustable supply of compressed air. Cross section of the recorder windway is invariable, so changing the air inflow it is possible to change the pressure in the chamber, and jet velocity depending upon it. The pressure value is evaluated with water manometer connected to the chamber. Fingerings are performed with help of adhesive tape, which is glued in three layers to prevent the induction of membraneous vibrations of tape.

For p/P-data receipt two treble recorders kept in Lenin*Cradian museum have been used. First of them (cat. no. 402) is made of ebony with rings and ferules of ivory. There is no master stamp but on the places where it usually is situated there are incrusted with gold, by picket technic, arms and monogram (not identified). Instrument design and decor character permit to suppose that it was made by Bressan. The foot-piece is not original (enjoying an opportunity to thank Mr. Friedrich von Huene for handing in the materials on Bressian recorder from Edgar Hunt collection). The second recorder (cat. no. 403) has the stamp of M. Parent on all its three parts. It is made of grenadil with ivory. Both instruments have damages which do not put obstacles however, in studying problems interesting for me. Frequency measurements were conducted with use of fingerings recommended by Hotteterre /4/.

In Fig. 1 p/P-curve of f* tone (treble no. 402) one of upper tones of lower register, is represented. At first the inflow of air into the chamber is so small that the air goes out through the windway without any acoustical consequences. When the pressure in the chamber reaches 6 mm of water, suddenly a clear, beautiful, although still sound appears. It remains till the pressure will not exceed 10 mm of water. Then the recorder falls silent again.
The appearance of such a "ghost" sound serves, in my belief, as sign of good adjustment of the mouthpiece. All successful recorders made by me have been characterised by appearance of such "ghosts".

When the jet velocity is small, it can be indefinitely much such situations when for given "lip-to-edge" distance will be as many wave cycles of disturbance find room in the jet as is necessary for in-time arriving to resonator. The problem only is whether there is enough power in order "to stir" the air column. In the example considered by Coltman (1, fig. 5) similar situations repeats twice before the musically usable process will arise. Naturally with such weak excitation the sound amplitude is small. However in full concordance with Coltman's prediction "ghost" frequency corresponds well to standard one, on which the instrument should sound in normal playing. This suggest an idea on "ghost" utilisation for instrument tuning control.

The recorder is silent till the moment when pressure in the chamber exceeds 12 mm of water. Then the sound appears more still and lower than "ghost". It is similar to what squeak. With the pressure increasing the frequency raises rapidly and loudness grows. Above 20 mm of water it is a well heard sound, while in interval of 24-30 mm of water it becomes the normal recorder sound. This part of p/F-curve corresponds to such pressures where the jet velocity stimulated by its transit time, is changing from the value totally discoordinated with resonator oscillation period to one where the jet acts in-time. This part of p/F-curve can be called transitional zone.

In conditions of p/F-measurements the pressure could be changed as smoothly as you like and stay as long as you wish on any value. In real playing the pressure increases over very short periods of time and the processes related to the transitional zone are usually imperceptible for the listener. The skilled player is able to regulate precisely the velocity by which this initial increase of pressure occurs, using different methods of articulation. With unsuccessfully formed articulation impulse (even by synchronous work of fingers) the processes inherent to transitional zone become appreciable. In such cases the player is accused of "gruntine".

When the player take tones in the lower register he should get over rather long transitional zone by means of well calculated "jump" carefully concealing these actions from the listener. Clean attack in upper register is connected with overcoming of more significant obstacles. In fig. 2 p/F-curve is shown. It was obtained from tone c third octave on the treble no. 402. Here everything also begins from the "ghost" after which a short curve occupies a much lower position. This curve corresponds to the first mode of tone by open thumb hole. The sound corresponding to it has no musical use, but then it contributes greatly in number of obstacles to clean taking of tone. Then a jump to the second mode occurs, the p/F-curve on this part having its own transitional zone (from 28 to 36 mm of water). How much the thumb hole facilitates tone in upper register is evidenced by lower p/F-curve in fig. 2. This curve corresponds to the tone taken by the same fingering, but with closed thumb hole. The pressure in the chamber has been brought to 130 mm of water but the tone does not reach the overjump yet.
In this connection the discussion devoted by Quantz /5, IV § 14/ to
the problem whether blowing should be strengthened in octave is
highly curious. Mr. Vaucanson does not in the least deserve
wrathful reproaches of Quantz. In full conformity with facts
he states that under stationary organized conditions of air-
jet action (exactly as the situation in "mechanischer Floten-
spieler") a considerable intensification of blowing is necessary
so that an overjump to octave would occur. This is expressively
evidenced by lower curve in fig. 2. -- The Quantz-Vaucanson
conflict has been discussed (not entirely correctly) by David
Lasocki /6/. --

In recorder playing this overjump is facilitated by usage of
register hole. There are quite different opportunities for this
in flute-traverso playing. Here "... player adjusts both the
blowing pressure and lip-to-edge distance in such a manner as
to control the arrival phase of the jet, and that this phase is
a more important variable in determining which mode will be
sounding than is the magnitude of the blowing pressure" /1, p. 989/
Thorough detailed instructions of Quantz /5, IV, § 13/guide
exactly to teaching of the right adjustment of lip-to-edge distance.
In this case increase of blowing pressure, naturally, should
not be significant.

Wide experience and refined observation of Quantz give at his
disposal important facts not always receiving, however, right
explanation. In this connection one of the arguments used by
Quantz "against" Vaucanson is highly interesting. In § 14 he
writes: "The opposite is confirmed even if by that the upper
notes could be held longer than lower ones with the same breathing
expenses that would be impossible if more air should be necessary
for high notes". Maintaining an excitation force in proper phase
relation with acoustical current the flutist increases the blowing
pressure and decreases lip-to-edge distance in taking of upper
notes, however blowing pressure increase is not indispensable
connected with increase of its expenses which in particular
essentially depends upon how narrowly tightened the players lips
are. Increasing or decreasing air expense under other equally
conditions the player controls sound amplitude. It is shown by
experiment that such control of amplitude could be carried out
independently from management of phase conditions of oscillations
/1, XII/. In other words in playing of upper notes the air could
be spent more or less and the fact that Quantz spent it less than
for lower notes, permit to make quite accurate conclusion about
what dynamic in upper notes correspond to good taste in Quantz'
understanding.

Between the pressures of 20 and 30 mm of water p/P-curve in
fig. 1 becomes less steep, then transformed into a sloping
straight line. All that the player seeks to use is situated in
this part of p/P-curve, therefore it could be called working zone.
The straightlinearity of the working zone indicates that there is
simple proportionality between pressure and frequency. This
proportionality can be expressed by the following equation:

\[ \left(\frac{p_1}{p_1}\right)^5 = \frac{P_1}{P_1} \]

where \( p_1 \) and \( P_1 \) - blowing pressures corresponding to some two
points of the working zone, while \( p_1 \) and \( P_1 \) - sound re-
in these points, the power $S$ is a value characterising the inclination of the working zone of p/F-curve. The principal meaning of $S$ small value is that when blowing pressure changes considerably, the frequency changes little.

It is easy to understand that the smaller the inclination at working zone is, the more the player has opportunities to take harmonious notes with little care about blowing force. (here a reservation is necessary, following further on), from the equation $(1)$ it follows that

$$S = \frac{1}{2(1 + \varepsilon)} \frac{p_2}{p_1}$$

The values obtained for some tones of treble no. 406 are cited below.

<table>
<thead>
<tr>
<th>$f_1$</th>
<th>0.025</th>
<th>$c_2$</th>
<th>0.059</th>
<th>$f_2$</th>
<th>0.055</th>
<th>$b_2$</th>
<th>0.061</th>
</tr>
</thead>
<tbody>
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<td>$p_1$</td>
<td>0.027</td>
<td>$c_3$</td>
<td>0.056</td>
<td>$f_3$</td>
<td>0.072</td>
<td>$b_3$</td>
<td>0.025</td>
</tr>
<tr>
<td>$a_1$</td>
<td>0.026</td>
<td>$d_4$</td>
<td>0.061</td>
<td>$p_4$</td>
<td>0.025</td>
<td>$c_5$</td>
<td>0.079</td>
</tr>
<tr>
<td>$b_4$</td>
<td>0.027</td>
<td>$e_5$</td>
<td>0.056</td>
<td>$f_5$</td>
<td>0.070</td>
<td>$a_5$</td>
<td>0.026</td>
</tr>
</tbody>
</table>

It is seen that the values for cross-fingerings are larger than for simple fingered tones. On the whole, however, these values are small enough and close to one another, indicating high quality of the instrument. I have chances to observe by far less happy state of things on the instruments of some modern makers. Thus small value of $S$ is an important condition characterising high quality of the instrument. It may be called the minimum disadjust condition.

Now the above mentioned reservation should be made: the player has a possibility of reliable taking a harmonious tone only in case the frequency of the standard scale lies within the limits of the working zone of p/F-curve. Let us call it the combination condition. Under this condition, such ambitious concept as expression of "well tuned tone" in relation to instruments, whose tones have widebandness, could be satisfactorily determined. How we are able to give definite determination for well tuned woodwind instruments regarding as such the instrument for whose all tones the combination condition by disadjust minimum is accomplished.

When the pressure increases further (after 70 mm of water) the missing additional sound $S$ appears. Then they increase still more while the tone itself as melts away. At 100 mm of water the missing additional sounds are very emphasized, the main sound is stratified, the fundamental part beginning to pulsate. A curious phenomenon occurs at that moment. Further increase of air supply does not cause pressure increase in the chamber, manometer stops until the over-jump will occur. At that moment as if superadmittance of windway is arising. At the moment of over-jump the manometer also makes a small jump. Before over-jump occurrence the frequency increases less rapidly than in the working zone, then it ceases to rise at all, and before proper over-jump it may even reduce. This part of p/F-curve in fig. 1 may be called zone of overexcitation.

The length of overexcitation zone in various tones is different. In the lowest tones of recorder the sound makes an over-jump suddenly without expressed phenomena of overexcitation. The p/F-curve of fig. 1 demonstrating one of the upper tones of the lower register, shows...
well the expressed and rather extensive zone of overexcitation. This zone is still more significant in tones in the second mode. At the base of all these facts is the circumstance, that for all recorder tones lip-to-edge distance remains the same.

Demonstrated and discussed by Coltman /1,7/ the meaning of adjustment of lip-to-edge distance has several aspects. From phase condition choice for main mode point of view there is an optimal value of this distance. It is connected with characteristic resonator frequency in such a way, that just at this lip-to-edge distance the most favourable generative conditions are formed. Alteration of this distance starts a mechanism of losses in one or another degree, spending the power which with more successful adjustment would go for sound production. Such degrees of incoordinating are quite possible when the resonance band does not at all include the sections with optimal generative conditions, but entirely consists of transitional or overexcitation zone.

Failure of certain lip-to-edge distance for main mode does not in the least means it failure for the second mode. On the contrary, with correct selection of this distance the second mode could be put in preferential conditions in comparison with the first one. Exactly this circumstance lies in the base of octave taking.

For higher modes this or another lip-to-edge distance has analogous meaning. As it was mentioned, an appearance of favourable situations in phase coordinating repeats several times at different energetical levels, having in a certain sense the cyclic character. The period of such cyclicity for n-th mode as many time less than first mode period, as many times n-th mode frequency is more than first mode frequency /1/. Thus lip-to-edge distance regulation is of great importance for all tone spectrum determination.

Due to peculiarities of its structure, the recorder deprives the player of a whole number of opportunities of this kind. Therefore, for example, in upper tones (for which it could be better to decrease lip-to-edge distance) overexcitation is expressed so much. As for the flute-traverso the player has everything necessary for a beautiful sound, and any flutist playing muddy tone should imagine he is spending the blowing power for this mud manufacturing instead of getting the nice sound with its help.

Bibliography.
Any discussion of action should include precise measurements of string heights at the bridge, at the nut, and at the neck/body joint or a given fret. There is no "ideal" action on a lute (or any other instrument) and different playing techniques will require different actions. Articles on lute action are less meaningful if string heights are not given since the reader may have no idea what the author considers proper action or what playing techniques are used. Some authors speak of a "high" or "low" action, terms that are misleading since "action" comprises a number of variables besides string height. Players often refer to action as "fast" or "slow", or "soft" or "hard". These terms are more descriptive than "high" or "low" since they give an impression of "feel" or overall playability, which is what a player is mainly concerned with.

My shop receives a great deal of repair work which I perform as a service to the very large classical guitar community here in Cincinnati. Since 90% of the repair work involves action problems, I have been able, over the years, to work out a limited set of parameters that may be applied to different playing techniques. I also frequently receive lutes that have developed action problems, or that were built with action problems. These have required everything from minor adjustments to total rebuilding of the instrument. The scope of this repair work has been great enough to allow me to develop insights into problems that could not have been grasped if I did no repairs but only built instruments. In addition, discovering what sort of problems occur in an instrument after a number of years has been rather instructive. I now anticipate these problems when I build and, as I will show later, use some construction techniques that could eventually allow some compensation for these problems. Any responsible maker will build an instrument not only for the immediate needs of his customer but for some future repairman (which will probably be himself if he built the instrument). I am sure that the old lute makers did likewise since all of the construction techniques that I use are often found on old lutes. (One of the fascinating aspects of building reproductions of old instruments is solving some particular problem of construction and later discovering that the old makers solved it in exactly the same way. In most cases this is probably because there is really only one solution that is simple, elegant, and the most appropriate for the problem.)

This paper will be limited to a discussion of the mechanical aspects of action and how they affect the playability of the instrument, as Geoff Mather correctly points out in Comm. 335, action also has a noticeable effect on volume and tone. However, the builder will have to work this out for himself since it is rather subjective. Too many variables (stringing, soundboard stiffness, bridge size and mass, your own notion of what constitutes...
good tone and proper bass-treble balance) enter into it.

**String height at the bridge.**

Old lutes that I have measured had holes bored as low as 3mm above the soundboard and as high as 6mm above the soundboard on the treble side. Holes on the bass side were usually (but not always) higher, since the bass strings vibrate with a greater amplitude and require more clearance. Lutes with a very low string clearance at the bridge may have had the soundboard dished inward between the bridge and the rose to increase the string height in this area and prevent the fingers from striking the soundboard. This dishing seems to take three forms. It is difficult to determine how much of it is intentional and how much is due to the distortions of string tension, age, and restoration work.

The first of these dishing effects that a builder is aware of is the concavity in front of the bridge caused by string tension and the tendency of the bridge to rotate forward into the soundboard. If uncontrolled, bridge rotation can cause the rose to move upward and buzz against the strings. A soundboard that stays perfectly flat under string tension will be too stiff to yield a pleasant tone with good projection, so some amount of dishing is desirable. I doubt that this concavity was ever manipulated by the old makers to increase string clearance, although it may have contributed to it in some small measure. (See figure 1)

![Figure 1](image1.png)

The second form of dishing can be noticed in many old paintings and drawings of lutes. The entire soundboard seems to be sinking in, as evidenced by a shaded area around the perimeter of the soundboard. I have seen this identical effect in many modern lutes I have repaired when the braces had come unglued at the ends. Some modern makers whose lutes I have opened have apparently interpreted this effect as deliberate and have glued negatively curved braces (figure 2) to the soundboard, introducing a tangential concavity in front of the bridge (figure 3).

![Figure 2](image2.png)

Although this concavity does significantly increase string clearance, I know of no examples of negatively curved braces in original instruments. If any reader has evidence of this, please let me know.
The third form of dishing is the most interesting. This takes the form of a longitudinal concavity introduced into the soundboard by planing a curve into the ribs adjoining the soundboard (figure 4).

This effect has been observed in extant instruments but has previously been taken to be the result of poor restoration. Some modern makers regularly duplicate this concavity with interesting results. Not only is string clearance increased in front of the bridge, but because of the curvature of the soundboard, normal dishing (figure 1) does not occur. It would be interesting to hear the tonal effects of this "pre-stressed" soundboard compared to an identical instrument with a soundboard exhibiting normal load-tension bending (as in figure 1).

However string clearance is managed, there is definitely a need to provide a high clearance for players who want to use a strict, classical guitar technique without scraping the fingerboard with their nails. The alternative to this is rejecting orders from such players (not an economically viable alternative for a full-time, professional lute maker) or building lutes with a low clearance and getting scratched-up soundboards and complaints from customers. I frequently have to raise the string height at the bridge for players who have purchased their instrument from a maker who is unwilling to be flexible in his approach to the problem. Oddly enough, the lutes with too low a string height at the bridge are invariably the ones with too high an action over the fingerboard! String holes on a 7-course (58-60cm mensur) lute, built for a player who chooses to use an authentic, thumb-under technique, I normally bore 5mm above the soundboard at the treble side of the bridge, and 6mm above the soundboard at the bass side of the bridge. A player who insists on using modern classical guitar technique gets his holes bored 6mm above the soundboard at the treble side increasing to 7mm above the soundboard at the bass side. (Fortunately only a few lutes have to be built to accommodate this technique anymore). Now, these figures are meaningless unless considered in conjunction with the neck angles and the string heights over the fingerboard that will be described below.

**Neck Angle**

Some makers have their lute necks canted forward (figure 5).
This creates an unusually "hard" action, since the strings end up rather high off the fingerboard. By "high" I mean 4mm or more at the body fret, measuring from the top of the fret to the bottom of the first course string (figure 6).

There is a precedent for this action established by Spanish guitar makers who have found that volume and projection could be maximized and an aggressive right-hand technique better accommodated with a hard action. It is a big mistake, however, to extrapolate modern guitar acoustics and mechanics onto a lute. This construction technique not only does not increase volume and projection, it makes the lute overly difficult to play. Worse, it leads to a situation where the string height at the bridge is too low (holes bored 1-4mm from the soundboard) since the strings must be lowered at the bridge to prevent the action at the body fret from becoming ridiculously high. Again, Geoff, Mather's suggestion (Comm. 335) that the neck be in parallel set, or in the same plane as the soundboard, results in the best action. By this I mean a string height at the body fret of no higher than 3mm under the first course and no higher than 4mm under the seventh, or 5mm under the tenth. Repairing a lute with a neck canted forward is difficult since paring away the neck, making it shallower at the pegbox end, is not always possible. Planing wood from the top of the neck can result in a narrower neck since, as seen in end view (figure 7) the neck is a sort of quasi-parabola. Cutting material from the top may mean moving the courses closer together. If the neck is not wide enough to permit this repair, it is necessary to disassemble the lute, remove and reglue the neck at the proper angle. Moreover, lowering the string height at the nut lowers the string height in front of the bridge even more, so the row of holes in the bridge must now be raised. This is done by filling all the holes with dowels (toothpicks), gluing on a bridge cap, and redrilling a new row of holes (with a flexible shaft and pin chuck). The drill bit can be guided by filing grooves for the new holes in the top of the bridge before gluing on the bridge cap.

I occasionally glue a neck on a lute with a backward cant (figure 8). This is done in order to get a low string height over the fingerboard when the strings are quite high at the bridge (for the reasons given above). More frequently, I tilt a neck backward and then glue on a wedge-shaped fingerboard, thinner at the neck/body joint and thicker near the pegbox. This brings the surface of the fingerboard back into the same plane as the
soundboard. In this way, I have anticipated an eventual problem—an increase in string height over the fingerboard caused by the neck pulling upward under string tension over a long period of time. The action can be lowered by planing down the fingerboard at the thick end. I have seen wedge-shaped fingerboards on some old lutes (although I don't know how original they were) and I imagine they served the same function. This method also allows me to get the first two or three courses as low as possible by shaving a little more wood off the fingerboard on the treble side.

**Neck relief**

When a string on a lute is set in motion by plucking, it moves in a long arc (Figure 9). In order to prevent the string from buzzing against a fret or frets, the shape of the neck must echo this shape.

This is called neck relief. It may be introduced into the neck by scraping the fingerboard or by tying on frets that are graduated in size—the largest fret nearest the nut and the smallest at the neck/body joint. A certain amount of neck relief will occur as a result of normal string tension, but this is usually not enough to prevent buzzing with a good, low action (as described above). I usually do both. I scrape the neck to introduce neck relief but also to give a slight camber to the neck (which helps hold the frets tight against it). The frets are still graduated in size, but because the neck has been slightly hollowed (longitudinally) only a few sizes are needed. I usually end up with four different diameters—the first three frets are 1.0, .9, .9 mm, the second three are .8mm, and the third three (I like to have at least nine frets on a neck) are .7mm. Thus, my customer does not have to fuss with too many different fret sizes. (Neither do I since I am the one who usually ends up supplying fret gut). Without neck relief, it is impossible to get a good "low action" without buzzing.

Occasionally, string height at the body fret is too high because of too much neck relief. Usually this is because the frets nearest the fretnut are too thick. This situation is always accompanied by a fretnut that is too high. Lowering all of these usually solves the problem, although scraping is sometimes necessary under frets 3, 4, 5, and 6, to eliminate small buzzes in this area. Test for proper neck relief by pressing any string down against the first fret and against the body fret. The string should clear the 4th and 5th frets by about 1/64 inch or not more than .5 mm. A higher clearance means too much neck relief.

If a 1.0mm fret is used in front of the fretnut, the height of the nut should be just enough to allow the strings to clear the first fret without buzzing. This usually means a height of 1.3 to 1.6 mm (from the treble to the bass side). Since different neck angles and different bridge heights will create a different set of parameters for regulating action, other fret diameters than the ones that I suggested may be necessary. Thicker or thinner frets may be used, but the net result is the same because action is not measured from the fingerboard or soundboard to the bottom of the string—it is always measured from the top of the body fret to the bottom of the string.
I am convinced that makers who construct lutes with the neck canted forward do this because they do not understand the concept of neck relief. Usually the frets on these lutes are all of the same diameter, a situation that seems to confirm my suspicion.

I have attempted to show that acquiring a good "low", "fast", or "soft" action is the result of regulating a number of variables, including height of strings at the bridge, neck angle, neck relief, and fret size. String length and string tension will also affect action. Higher string tensions will only allow slightly lower string heights at the fingerboard since the effect of tension is negligible. The above comments are directed toward 7-course lutes with string lengths shorter than 63 cm. 10-course lutes with 65 cm or longer string lengths and Baroque lutes will require a slightly higher action. 10-course lutes of 65 cm will usually be 3.5 mm between the body fret and the first course, increasing to 5 mm underneath the 10th course. Baroque lutes will be 3.5 to 4 mm under the first course to 5 or 6 mm under the eleventh.

It goes without saying that frets should always be gut rather than nylon. Gut tends to bed in when tied tightly around a neck, while nylon frets leave a slight gap between the fret and the fingerboard underneath the first and last course. This is due to the inability of the nylon to conform to the sharp angle of the neck at these two points. In addition to having a small effect on action, the slight gap is springy enough to absorb an enormous amount of acoustical energy, destroying any brightness that the treble may have had.

All of the recommended string heights in this paper lend themselves to the acquisition of an advanced playing technique, and are also appropriate for what we consider authentic right-hand technique (except where noted). They should be taken as maximum clearances rather than standard. I have occasionally been able to work the action on a 60 cm lute down to 2.5 mm under the first course and 3.5 mm under the seventh, with no buzzing. On a lute with a shorter string length (52-54 cm) these figures are easily obtained and should be standard.

Regarding string clearance in front of the bridge—I am not suggesting that clearance be increased in this area (by any of the methods described in the beginning of this paper) solely to accommodate players who use a modern classical guitar technique. Players who use an authentic, thumb-under technique are usually comfortable with a low clearance in this area. Resting the little finger on the soundboard becomes less comfortable as the string height is raised. Playing techniques changed, however, after the 16th century and lute-makers may have wanted to increase string clearance in front of the bridge in response to the demands of their customers. I have merely attempted to suggest some ways that this may have been done. Adapting lutes for classical guitar players should be done with caution. I would advise doing nothing that could not be reversed since (on this side of the ocean) players are more and more frequently discovering the advantages of thumb-under and returning their lutes for conversion to a wider string spacing and a lower action.

Much of the repair work that my shop receives involves correcting unusually bad action problems that are normally found on all inexpensive, mass-produced classical guitars (and many

* OOPS! Guillotine slipped. Re-type paragraph. D. S.
expensive ones). Good teachers are usually able to spot this problem and send the student around to my shop to have it corrected. People who attempt to teach themselves to play are invariably frustrated since they have no idea that their problems are caused by a poor action on a brand-new instrument. Since we are providing our customers with a hand-made instrument that costs (presumably) ten times what is charged for a factory-made instrument, we have an obligation to provide them with something that is more playable than these cheap instruments. This paper was prompted by the number of lutes that have found their way into my shop with necks canted forward, treble strings 4 to 5 mm off the fingerboard, and other disheartening characteristics. I hope that I have been able to contribute in some measure to a re-examination of set-up practices and careful consideration of the results.

**A NEW EDITION OF LANGWILL’S INDEX?**

1. The need for a reference book listing Wind Instrument Makers has been clearly demonstrated by the circulation of six editions of Lyndesay G. Langwill’s INDEX throughout the world, a book unique in its field.

2. Future editions, up-dated and improved, are clearly called for, but LGL is not planning to produce any future edition himself.

3. There is evidence that, unless a plan to re-issue is announced soon, some other version will be produced. If this happens, its identification with LGL will be lost, and his copyright in the INDEX may be breached.

4. For a new 7th Edition, the mere addition of an appendix, as in the 5th and 6th editions, will not suffice; the whole text must be reset. For this and any subsequent revisions, the use of data storage technology could prove worthwhile.

5. All the data on individual makers needs re-checking as well as being added to — tasks which require detailed local research. Data on holdings also needs up-dating. The requirements of modern scholarship puts this task beyond the unaided powers of any single individual.

6. The opportunity to muster local research contributors exists, thanks to the membership of such bodies as the GALPIN SOCIETY, AMIS, CIMCIM, GEFAM, FoMRHI, IGEFB, etc.

7. A Committee should be formed (with LGL as Honorary Adviser) to plan future editions, with representatives in many countries, responsible for furnishing and checking data relating to their own areas.
8. Guidelines for the scope of the new INDEX should be decided on (e.g. need the data contained in Phillip Young's "2500 Hist. Wind Instr." be included?).

9. An interested publisher has been found, who is willing to provide data storage facilities.

10. LGL approves of this project in principle and would undertake to make over to a future editor all his rights in the INDEX, together with his files and reference material relating to the previous editions. As Honorary Archivist of the Galpin Society, as one of LGL's Literary Executors and with the approval of my fellow Executor, I am exploring these possibilities on his behalf, and would welcome your reactions and comments.

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Review of Dionisio Aguado, 'New Guitar Method'

There were many methods for the guitar published in the early 19th century, the best-known being those of Carcassi, Carulli, and Sor. Yet the method of Dionisio Aguado could be considered as perhaps the most important, for it not only gives clear and valuable instruction in the art of playing the guitar from the 19th century point of view but also contains a wealth of information of interest to the musicologist.

The Tecla Edition is not a facsimile, though some of the more interesting plates have been reproduced. These include a portrait of the author, various hand positions, and illustrations of 'la Tripode' - more of which later. The book was originally published in Spain in 1843 and has been translated into English by Louise Bigwood. A scholarly introduction by Brian Jeffery summarises many of the more important aspects of the book. The reader who is familiar with other methods of the period will no doubt agree with his assertion that this 'is the most detailed and thorough of the early 19th century methods for the guitar'.

Aguado was born in 1784 in Madrid, and would have seen the changes that occurred in the construction and stringing of the guitar. He would have been familiar with double strung guitars, and in particular the six-course guitar, an instrument which was in use in Spain until well into the 1820s. It is also probable that Aguado was familiar with the five-course 'baroque guitar', and remarks ...'each of the strings forms a course, which is why guitars are said to have six, seven, or five courses, depending on the number of strings. A guitar is known as single when there is a single string to each course, which is certainly preferred and what is actually used today, but if there are two strings to each course, the guitar is said to be double, even when the first string is single'(19). His mention of a seven course guitar is particularly interesting; there is a rare example by Francisco Sanguino of Seville c1780 in the Museum of the Barcelona Conservatory.
Aguado was deeply concerned with all aspects of the instrument including its construction, and claimed the design of a bridge which is still in use today(27). His description of this bridge as 'de invencion nueva' in his Escuelas of 1324 at least establishes its use by that date. He recognised the significance of the angle made by the strings over the bridge(28), and also the importance of string balance '...the guitar must have equality of tone; I mean that the sounds made by the upper strings should correspond in volume to those of the bass strings'(25). He even gives specific advice on the type of room acoustics that are most suitable for the guitar(31).

He was the inventor of 'La Tripode', a stand which held the guitar firmly thus eliminating any strain caused by supporting the instrument, and allowing it to resonate freely. Although the device was recommended by Fernando Sor, it is one of the many 19th-century improvements' that have not survived, though a few players today are experimenting with it. The interested maker will find the Tripode illustrated and discussed at length (20es.49es.360es).

All of the essentials of today's technique can be found in Aguado's book of 1843. Many of the studies have not been published in modern edition and are a worthy addition to the repertoire. There is much that is relevant to the interests of both the performer and the musicologist, and one must congratulate Tecla for publishing this well-produced edition.

FoMRHI Comm. 423 Jeremy Montagu

Review of: Check-Lists of instruments in the Edinburgh University Collection of Historic Musical Instruments. £1.00 each including postage in UK; £1.50 each including postage abroad (remittances must be in £ sterling).

a) Bernard Emery, Bowed String Musical Instruments

A number of interesting items. Violins, of course, including the unaltered one from Northumberland described by Kenneth Skeaping in GSJ 14. The rest have been modernised but several only by changing the angle of the original necks. Also violas, cellos, including a piccolo by Gilchrist, and a couple of basses. A number of kits, including the two on pl.XXXI of Hipkins & Gibb, three viole d'amore again including one which Hipkin & Gibb illustrated, some viols (Kambl treble, 1736; Hintz tenor), four hurdy-gurdies (Lambert en luth, Ouvrard en guitar, Colson en luth), and a fair number of bows.

b) John Dick and Arnold Myers, Flutes and Whistles

A very impressive collection, with a lot of important instruments. I'm not reviewing it in detail (a check-list is a check-list; there are brief descriptions with overall lengths - the bowed string list has slightly more detail: overall length, body length, width, depth, sounding length where ascertainable - number of keys, inscription, etc, roughly all one needs for identification). What I really want to say, and have said before, is that this is clearly a major collection, it is easily accessible to the majority of FoMRHI members (there is still just a majority living in the UK I think) and Arnold Myers, the curator (he's also a FoMRHI member), welcomes visitors. However, if you are to get the proper benefit from a visit, you need to know what's there, so write to him (at the Reid School of Music, Teviot Place, Edinburgh EH8 9AG) and buy these check-lists before you go up there. You should know, perhaps, that the collection consists of the original Reid School Collection, much of which has
been there for over a century, the Rendall Collection and other gifts which were originally intended to be the Galpin Society's Permanent Collection, and on loan the Brackenbury Collection (mixed) (I should have said that the Rendall was general woodwind, not just the clarinets which he wrote about in the Benn series), the Macaulay Collection (strings, mainly plucked), the Ross Collection (which came from Glen's shop; Andrew Ross took over the bagpipe business from Glen and had a good mixed collection, mainly wind), the John Dick Collection (I think mainly woodwind), some of the Mickleburgh Collection (from Bristol; when I saw it there some years ago it was a very wide-ranging collection of almost everything, but I don't know how much has got to Edinburgh), and the Arnold Myers Collection (mainly brass I think). So there is a lot there, and more accumulating all the time both through gifts and loans and through the fact that Arnold and John (he's a member, too) are still collecting.

Reminder: Earlier check-lists were reviewed in Q 26 (double reeds), Q 24 (brass and ethno).

Arnold points out that I was wrong in saying in Q 26 that there were only two alto fagotti; there's one in Boston (ex Galpin and shown at RME) and there were two others in that exhibition in 1890, only one of which is likely to be one of those in the Reid, so there must have been at least five of them if not more. Apologies.

FoMRHI Comm. 424 Jeremy Montagu

Review of: Two Catalogues of Exhibitions at the Dreieich-Museum.

Peter Spohr sent us a notice about this year's exhibition (see Bull. 27, p.4), and he has sent me a copy of this year's catalogue (flutes) and of the 1980 catalogue (bagpipes and hurdy-gurdies); there was no catalogue for the 1981 exhibition of plucked strings. I fear that this year's exhibition will be over before you get this (it closes on 8th August), but the catalogues may be of interest, especially as both are almost fully illustrated. Copies are available (though I'm afraid that I don't know prices) from Peter (address in Members List) and could be useful as location lists, as well as interesting in themselves, though the majority of instruments in the flute catalogue are listed as 'Private Collection'. In more detail:

a) Kurt Reichmann & Peter Spohr, Flöten aus fünf Jahrhunderten

An annotated check-list of this year's exhibition, with the majority of the instruments illustrated. Produced by offset litho or some such process (much like FoMRHIQ except that it is printed rather than typescript), with the result that some of the illustrations are clear enough, but others, particularly those of dark wood instruments, are little more than a black bar. However, for a catalogue of a temporary exhibition, it is excellently done and very adequate. There is as a rule rather more information than there is in the Edinburgh check-lists (also reviewed in this issue), partly due to the annotations and partly because in each case both overall and sounding lengths are given, and of course because of the illustrations. There are a number of important instruments listed (eg the Frankfurt Historical Museum's recorders) and, as well as the European instruments, there is a very large and representative selection of non-European and European folk flutes. Even if you can't get to the exhibition, I'd say that this catalogue is well worth having.
b) Kurt Reichmann & Marianne Glier, Drehleier und Dudelsack

I'm less sure how worth while this one is, chiefly because you'll only read it once and then you'll have a handful of separate pages. The binding is a strip of tape that may once have been adhesive down the spine. Since it no longer adheres, it's not an effective binding. Admittedly this was a temporary exhibition and it was two years ago, but nevertheless one expects a catalogue to last longer than that. It consists of a short description and history of the hurdy-gurdy (4 pages) and the same for the bagpipe (5 pages), followed by a photograph of each instrument exhibited, with a very brief description as a caption. A considerable number are reproductions (the source is always given). If you want a good collection of photos of hurdy-gurdies and bagpipes, then this might be worth having (and if you have two copies, you can chop them up without worrying about what is on the back of each sheet).

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Jeremy Montagu


A fascinating book and a must for anybody concerned with collections of instruments. It lists all the published catalogues known to the author of public collections (museums, trade exhibitions, worlds fairs and so on) in the first section, and of all private collections known in the second. The latter part includes also a large number of auction catalogues recording the dispersal of such collections.

One might think, from such a description, that nothing could be less interesting, but one would be wrong; in fact the book lost me two days' work. I started out by glancing through it and quickly came across a few references that I didn't know; then I spotted one that he didn't know, and then of course started to go through in detail to see just many that I knew weren't in it, and how many were in it that I didn't know. He won hands down, not surprisingly, and most of the catalogues he hadn't got were either too recent to be in it or were on ethnographic instruments, on which he has quite a few entries but which are on the whole weaker than the rest.

The reason that I say that this book is a must is that if we are concerned with instruments we have got to know where they are; the only way to find out is to know the catalogues of as many museums and other collections as possible, and if you want to know what catalogues there are, this is the book that will tell you. There is only one snag: at $25 the price of the book is fairly reasonable for nowadays, but it won't stop there. If you use this book properly it will cost you a packet by the time you've bought all the catalogues you'll find in it, and it will also cost you a lot of hours in the libraries, going through the catalogues that you can't buy any more.

One request, passed on from the author: if you do find any gaps, please let him know. Help your mates by helping him to produce an even better second edition.