FOMRHI Quarterly

BULLETIN 17
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FELLOWSHIP of MAKERS and RESTORERS of HISTORICAL INSTRUMENTS

Bulletin no.17 October, 1979

FoMRHI: Some members have asked how our name is pronounced. When we first decided to set it up, we ran through various names (Societies, Fellowships and so on of this, that and the other) until we came up with something that would produce an acronym which could, with an effort, be pronounced. The result is: FoM as in bomb or Comm; RH, the H being silent (as in rhombus or rhododendron), as in ridiculous. Now that we have ended with a Q for Quarterly, FoMRHIQ is the same as FoMRHI plus a hic, as in nick. OK?

1980 SUBSCRIPTIONS: These are now due. We have had to increase them, I'm afraid, partly because printing costs are up (and look like going up further and perhaps quite sharply so) and partly because postage costs have just gone up. The rates are: U.K. and elsewhere by surface mail, £4.50; anywhere by airmail £6.00.

This represents a departure from previous practice. In the past, all subscriptions outside Europe were automatically airmail. Because the subscription is now going up, we have decided to give you the option of speedy communication plus expense or slow communication plus economy. If you choose the latter, bear in mind that trans-Atlantic sea mail can now take a couple of months (I can't think why; do they use rowing boats?) and longer to Australia and Japan, which means that comments on one issue might not reach us in time for the next. But the choice is yours, and Djilda is sure that she can keep the mailing straight, so that you will get FoMRHIQ by whichever method you choose. To help us, do please mark the renewal form (herewith) clearly.

Also increased is the charge, now £1.00, for payments which are not in pounds; the bank is charging us more, so we have to charge you. Do not add this pound if you are paying in pounds, if you pay by GIRO Cheque, by Postal Order or Mandat, or if your bank sends a Bank Draft payable by a bank in London - we are not charged on any of these. Do add the pound if you pay in dollars, francs or any other foreign currency, or if you pay by Eurocheque or by any non-British cheques (except the Bank Drafts just mentioned). In case it helps, our bank account no. is: Clydesdale Bank Ltd, 30 Lombard Street, London EC3V 9BB (their code no. is 82-04-03), account no.60255878. But do not just have your bank send money to them without letting me know; if I don't know you have paid, you won't get any FoMRHIQs.

What may make things easier for North Americans is that Theo Miller has offered to collect subs from Canada and USA and send them over in bulk. We still need to charge something for bank conversion, and to allow for variation in exchange rates, but 50c. should be enough, which is only a quarter of the £1 which we need here. This offer applies only until the end of December. If you want to pay this way, send your cheques to: Theodorus Miller, HRI, Port Washington, B.C., Canada, VON 2TO, with a note that it's for FoMRHIQ, and your renewal form to me, filling in the amount you've sent Theo so I know whether you want air or surface.

This all seems a little complicated, but if it saves money, and also saves the nuisance of going down town to get a bank draft, it'll be worth it. For future reference, we would welcome offers from other countries where there a number of members to do the same job.

BORROWED FoMRHIQs: I've heard from several people that they have been getting along on borrowed copies. This is fine by us. Do lend your copies to friends and colleagues. If they decide to join us, encourage them to do so, but if they only want to read articles, let them read yours. We want members, but we want to spread information even more. If they want a copy of an odd Comm. or two, xerox them or let them do so. If
another journal wants to reprint one of our Comms or anything out of the Bulletin, write to the author for permission to do so, but don't bother to write for PoMRRHQ's permission - we do not claim any copyright, though it's nice if a note that the piece first appeared in PoMRRHQ is added.

JOINT MEMBERS: To remind you that we don't charge for added entries in the List of Members. If a couple both work on instruments, and don't want two sets of PoMRRHQ cluttering up the house, we're happy to list both names, and the same goes for partners who don't want two sets in the workshop (but bear in mind that if you split up, you may not be able to get a set of back issues).

REPRINTS OF BACK ISSUES: There was some confusion in the last issue about these. Please note that they are all flat, single-sided sheets, each carrying two pages of PoMRRHQ, paginated as in the original copies so that they can be stapled or sewn up into issues. The resulting issues will be twice as thick as the originals, of course, which may be inconvenient, but double-sided copies would cost about four times as much. Postage costs are 85p per issue or £3.00 for 4 issues in Canada; £1.00 per issue or £4.00 for 4 issues in U.S.A.; 30p per issue or £1.00 for 4 issues in UK and anywhere else by surface mail; £1.25 per issue or £2.00 for 4 issues to Europe by airmail; £1.25 per issue or £4.50 for 4 issues elsewhere by airmail.

Those listed in £ are for orders to Theo Miller (reprints themselves cost 5p per numbered page - list of number of pages on p.2 of last issue); those listed in £ are for orders from Geoff Kime (1p per numbered page).

LOST MEMBERS: Malcolm Prior, whom we had lost in the past, reappeared and resubscribed, and when I sent his PoMRRHQs to the address he gave, they were returned marked 'Unoccupied'. Does anyone have a current address for him? Or if anyone sees him, would they please ask him to get in touch with me?

Has anyone an address for Philip Lord (late of Diemen, Netherlands) or for Karl Baumann (late of Sussex Place, London)? I've had their PoMRRHQ l6s returned marked 'Gone away'.

Please let me know when you move; you won't get PoMRRHQ if you don't, and present postage costs are such that we can't afford to send things out twice.

EARLY MUSICAL INSTRUMENT EXHIBITION: As in the past, this was a very successful three days at the Horticultural Hall. I imagine it was good for business for everyone, and it was certainly a wonderful chance to see one's friends and make new friends. We are all grateful to Richard Wood of the Early Music Shop in Bradford and to EMIMA for all they do to make it possible.

ANMIS: Ed Bowles asks me to tell you that the 9th annual meeting of the American Musical Instrument Society will be at the Metropolitan Museum, New York, May 9-11, 1980. Papers, lectures, ideas for anything else, should be submitted to him (with abstracts) by October 1st (as he sent this to me, knowing that the October PoMRRHQ won't reach you till the end of the month, I hope he means as soon as possible). Maximum length is 20 minutes. If you're within reach of New York, attend the meeting if you can - what I've heard of past ones sound well worth while, and I'm sorry I can't afford the fare.

EUROPEAN SEMINAR ON EARLY MUSIC: I had a note in August from Bryan Tolley who had just come back from this in Brugge, saying that it was a wonderful two weeks of lectures and discussions, playing and concerts, with singers, instrumentalists and makers from all over Europe, including the Eastern bloc. It's an annual event and he's already looking forward to the next one. He didn't give me the organiser's address, so if this whets your appetite, you'll have to find it for yourself, unless someone sends it to me.
FURTHER TO: Bull.14, p.3 (Ivory): Tim Hobrough writes: This was formerly a rare and expensive material which today is treated as something perfectly ordinary, and is used to decorate some pretty mundane instruments. Restricting its use to genuinely expensive instruments, say those costing at least six months' salary for a full Professor, and not substituting any of the numerous ivory substitutes on cheaper instruments, would encourage builders and buyers alike to have a realistic view of its monetary and ecological cost. It wouldn't hurt if both FoMHRHI and EMIMA were to call officially for a complete halt to the use of ivory for decorative purposes.

If you do want a substitute, see Kevin Mercer's Comm. in this issue, jm.

Further To: Bull. 15, p. 6 and Bull. 16, p.3 on oils: Trevor Robinson writes:

On the question of what oil to use in the bores of woodwinds, I merely want to point out that almond oil, whatever its faults and virtues, is surely not a drying oil. The drying qualities of vegetable oils depend on their content of esterified linolenic acid, and almond oil has none. Oil chemists use a drying index number ranging from zero up to about fifty to describe natural oils. No oil with a number below 25 rates as a drying oil. Linseed is 35. All the common edible oils (peanut, cottonseed, corn, safflower, etc.) and almond oil rate zero. Soybean is about 5. Therefore, if there are important differences in the qualities of vegetable oils for bore oiling, those differences must be sought in some characteristic other than drying ability. Let me suggest that some oils contain more antioxidant constituents than others, but whether these are desirable or not is another question. I can imagine that it is oxidation products of the oil, rather than the fresh oil, that deter growth of mildew. In that case the oil with the lowest content of antioxidants would be the best for oiling bores. On the other hand ---but what we need is less speculation and more facts!

To which I'd add that I have been told that almond oil will eventually dry; olive oil was said to be non-drying if my memory is correct, but it leaves a sticky residue and should therefore be avoided. jm.

Comm.188: The American edition of Charles Ford's Making Musical Instruments (Pantheon Books, New York) is reviewed in the AMIS Newsletter of June 1979, and I noticed that the price was $15. The English edition (Faber) reviewed in Comm.188 cost £15, i.e. just on twice as much. Book prices are really something to wonder about. My own Medieval & Renaissance book cost £7.50 here and the American edition cost $20.00 (about £11 then); the American edition was printed here and cost them £4 per copy. Did they really need another £7 for shipping, selling costs and so on? And do Faber really need about £7.50 more than Pantheon? Or are we all being taken for a ride? And in case you are wondering, the £4 was all that they paid for Med & Ren; I got my royalty of 40% a copy out of that.

Comm.206 (also 216 & 218): Peter Tourin writes: Concerning Eph's justifications for using the method, I think that an important justification is that the method is analogous to historical methods of testing the bellies as one carves them. Looking at Mode 5 is similar to the tap test in which one holds the belly at the node in one of the upper corners and taps in the center. Looking at Mode 2 is similar to holding at this same node and tapping on the center line near the bottom edge of the top. I suspect that Mode 2 also relates to flexing the belly at the left and right sides of the lower bouts, and then at the left and right sides of the upper bouts, checking to see if they give equal resistance to flex, and also to holding across the bottom and top of the belly with both hands and twisting torsionally to feel the stiffness of the belly to twist. If part of one's aim in instrument building is to learn how the instruments behave acoustically so that one can build better and quicker, then Hutchins-style acoustic testing is very useful, as it gives the builder two methods for checking the same things, and thus educates him more quickly; one can be much more
positive of something if two separate methods both confirmin it.

George Bowden writes: On quality of sound in old instruments, if present
day examples are anything to go by, the personality of the maker seems all
important. Some men won't make fine instruments but they know a great
deal about sound and thus they put into their instruments. Other men do
fabulous fine decorative work and their instruments don't sound. They don't
know how to make them sound and if anybody told them, some of them would
automatically reject the advice and do the opposite. I mention this because
all this talk about making instruments sound like the old ones is very
relative. I suspect that many very good sounding instruments were played
until there was nothing left of them and some very poor instruments were
preserved because no one would play them anyway. I could give actual
cases of this which exist today. Always the human element comes into it.

JM adds: Eric Halfpenny made this point of good instruments being played
till they fell apart, and only bad ones being left, many years ago, and
there is a lot in it. But as I've said to Peter Tourin, I'd still like
to see Mode patterns of old instruments; were they aiming at the same things
that we are? After all, the modern violin maker is trying to get the
maximum resonance for an instrument to play in acoustically dead concert
hall or recording studio; the old viol or violin maker was trying to
get the most beautiful sound in an acoustically live wooden chamber.
Are these aims the same? The fact that nobody in their senses would use
a Strainer or Amati violin (especially one in original state) for the Brahms
or Tchaikowsky Concerto in the Festival Hall, suggests that these aims are
not the same. Of course if you are making viols to play the Dvořák Cello
Concerto on, that’s another matter, but if we are thinking of authenticity,
should we be worrying about how the instruments will sound in the Festival
Hall or Studio One?

See also the Comms herewith from John Connett and Bill Samson. And probably
a counter-blast from Eph to my note above.

Bull.16, p.6 (Frequency generators): I've had a note from Larry Domonkos
asking what type of tuner and what kind of controls would I personally
think that the members of FoMRHI would be interested in - battery versus
A.C., etc. He adds: Right now we can produce a Mean-Tone Pitch Box, battery
controlled, for about twice the cost of the equal tempered Pitch Box I said
$68.00 plus shipping in the last issue; Tony Simpson told me that he got
caught for Customs duty plus VAT on top of that. If there is a real need
we would consider producing the Mean-Tone Pitch Box. In addition we can
produce a Pitch Box with Mean, Just, and Equal Temperament all in one,
powered by alternating current.

I replied to him that one problem with the mean-tone box would be the price;
still cheap, but beginning to get up towards other machines, and that fixed
quarter-comma meantone might not be any more useful to someone who wanted
Werkmeister 3 etc than equal temperament. Also that battery, though
more expensive to run, would be better than A.C. at American voltage and
cycle rate, both of which differ from ours and from other countries. But
I added that I would ask you what you want in a Pitch Box. Replies to
him (address in the last issue) and a copy to me, please.

I've also had leaflets about another one, recommended by Theo Miller. This
is made by M.Ward Widener, Widener Engineering, 203 Westbrook Drive, Austin,
Texas 78746, USA. Theo says he is a professional musician as well as an
electronics engineer, and recommends his Model 120 which produces the
pitches which have been punched on a computer card; since 2048 tones are
available in the octave, one can punch the card to any temperament one
wishes to an accuracy of one third of a cent; with a selection of cards,
one can switch from temperament to temperament. There is a visual check
strode as well as tone output. Battery operated, it costs $169 plus
shipping ($5.00 in USA, $20 for export). He also has a number of other
models, from a pocket version at £9 to a 12-strobe model at an unspecified price. The main snag that I can see, from reading his literature, is that even those models on which the basic pitch can be varied from A-440 can only be varied by a semitone (quarter-tone each way) and thus anyone who wants A-415, or any other pitch below A-425, will have to start at 830 and perhaps recalculate. You'd be OK tuning from C, but you would not have a bottom A.

Perhaps Mr. Widener would also be open to suggestions; certainly Larry Domonkos is, and if you are not yourself an electronics engineer but are certain in your mind of what you want for a tuner (apart from your own ears), perhaps this is your chance to spell it out.

Comm.219: Eric Franklin (note his new address in this issue) is intending to make a study of the Lute Society's picture collection, along the lines suggested by Martyn Hodgson in Comm.219. The question is what details are worth recording, and he would be glad to receive ideas from fellow members. Obvious ones are: Artist; Date; Country of origin; Number of courses; Playing position of right hand, thumb or fingers forward. More of a problem are measurements; he hopes that some figures, with an indication of probable reliability, could be ascertained, presumably using the usual factors such inter-ocular distance. However, others have suggested to him that artist's licence may prohibit any useful assessments. I suspect that even artist's licence and the problem of small men with big lutes and big men with small lutes might still allow him at least, as he hopes, to produce some width/length ratios, shape patterns and so on. He would welcome suggestions and also requests to note any other details which members would like to have information on.

Comm.225: Tim Hobrough asks whether Pete Holmes could describe his filing system a bit more, so that we know what it does and how it works; he says that it seems to him that if it works at all, it should be used since it's already in existence; an absolutely perfect system is unachievable, and will be obsolete before the typing's done, so we might as well go with Mr. Holmes.

Ed Bowles, on the other hand, says:

Concerning the computer cataloging offer by Peter Holmes, as some one with (obviously) some knowledge of data processing, the first priority is to decide (agree) on standardization of information and what kinds of data to input. On the first point, as you may know, the RIM system at the City University of New York has a standardized data card for cataloging and computer input followed by all member-institutions; the computerized data base that produces the RTIM Abstracts can, I believe, eventually handle the pictorial type of data through the GRIPHOS program (operating on F-level PL/I for those interested in technicalities). No need to re-invent the wheel, in other words! As far as types of data is concerned, at the absolute minimum, it seems to be, would be, for example, the list of 15th century artifacts (mostly illuminations) containing musical instruments listed in the back of my book, Musikleben im 15. Jahrhundert. Again, unless we all decide and agree on this point, you end up with a mass of inconsistent and incompatible (from the computer's standpoint) data; this we don't want to happen.

Incidentally, Ed has complained in the past about the appearance of our and my typing and suggested that we should use IBM machines. When I compare his above and my typing, I do see what he means. The snag is that my electric Adler cost about £300 and an IBM like his would cost most of £1,000 or more even second-hand. So you will have to put up with us. Hiring is not the answer either; even if we could afford it, I haven't the time to go chasing round collecting and returning machines.
COURSES: The Early Music Centre course handbook has arrived here. If you want a copy, their address is in the List of Members. Most of their courses are for players, and include Master Classes, Professional Courses, Weekend Courses and Evening Classes. There is also to be a Summer School next July 20th to 26th. There used to be some making courses, but they seem to have dropped those.

The Centrum voor Muziekinstrumentenbouw, Van Hoomissenstraat 32, 2671 Elkevliet-Bornem, Belgium, has sent me their leaflet listing various courses. They seem to weekly, either every Saturday or every Wednesday, in two half year cycles. Since the leaflet is in Flemish, I presume that that will be the language of instruction.

Walter Sallagar says that he has some interesting projects coming up next year and that we shall hear more from him soon.

QUERIES & REQUESTS: David Ross in over here for a while studying Clarinets and would be grateful for any invitations to examine 18th and early 19th century instruments and for any information of where he could find examples. He is staying with Georgina Dobree at the moment, and any messages or letters to her at 5 Wellfield Avenue, London N10 2EA, tel: 01-444 0645 will reach him.

Michael Heron (note his new address herewith) asks for information on the Hardanger Fiddle, including history, construction, plans and tuning. I have suggested he write to Peter-Andreas Kjeldsberg at the Ringve Museum but I don't know whether they have any plans. Can anyone help him?

Peter Armitage (address in the last issue) is restoring an English guitar by Preston similar to that in the V&A etc Travelling Exhibition Catalogue (18th Century Musical Instruments: France & Britain), plate 58. It had at one time a Smith's Patent Box and a capotasto. Can anyone provide him with details of the Box's mechanism? As he lives in Kenya he can't go round to the V&A or Horniman and have a look. And he also asks whether the capo was just a plain bar or not? I must confess I had always assumed that it was and had never looked to see; can anyone please have a look at one and let him know?

Bengt von Matern asks:"Is there anywhere in the world an instrument with this technique: First the string is touched by a clavichord pin. Immediately afterwards plucked by a jack as of a cembalo."
Presumably the result would be a gebunden harpsichord and might be quite a useful idea!

Maurice Briggs asks to whom he could write for plans for a Spinet or Virginal. I get quite a lot of requests for plans (see below under that heading) and I think that perhaps it is time that we had and issued a central registry of plans available. Charlie Barker might be willing to do this (see below); would there be a demand for it? And is every organisation that is sitting on stocks of plans (eg NRI Design Service and a number of Museums) willing to list what they have got and to make copies available over and above the ones that they actually list for sale? We did have a Museum Contact idea at one time, but it seems to have slipped; can we revive it?

Kenneth Williams would like to find a definitive source of information on the construction of small (4 octave) single rank organs suitable for continuo. His address is in the last issue. How authentic, I wonder, is the use of such organs? It's always going on in all concert halls, but did it ever happen then? We use these little organs for Bach cantata continuos and in the Masses and Passions, but did JSB really use such an instrument when he had a whacking great organ up the end of the church? I'd be interested in other people's reaction to this question; obviously the continuo should not drown the orchestra and chorus, but should it always be the little box of flutes that we hear? No appersions on Kenneth in these comments, of course, but he has raised a question which has nagged at me for some time.
TECHNIQUES: Kevin Mercer, who is a dental surgeon, has sent me an X-ray he took on his dental machine of the head of a recorder which was getting clogged up through a fungal attack. He intends to write this up properly in due course as he has not yet properly identified the fungus and so on, but meanwhile I thought it worth putting in a note about it. We have been accustomed by Eric Halfpenny and others to seeing full X-rays of instruments, and several Museums, especially the Germanisches Nationalmuseum in Nürnberg, produce X-rays of their instruments. I'd not come across the idea before of using dental machines for detail work, and others might like to take it up. Kevin does not recommend this, as it would presumably depend on the variety of the fungus, but he dealt with his by treating it with 4% Chlorhexidine gluconate (trade name Hibitane - ICI, which is available in small bottles from chemists) in water/alcohol and being careful only to treat the locus affected (the absorbent stone that Moeck inserts). Fuller details will follow when he's worked on it further, but meanwhile please do pass on any such techniques and ideas to your colleagues. A friend and I were discussing the other day just what happens to a reed when one is playing; next time I go to my dentist, I'll ask him whether his machine would let us find out.

TOOLS, ETC: Another comment of Kevin's is that broken dental probes make the best purfling chisels he's met. Being a dentist, he's got an unlimited supply, but one can buy them (or cadge them from one's own dentist). I picked up a box full in a junk shop years ago and find them a god-send for all sorts of scraping and cleaning jobs, but hadn't thought of regrinding them as chisels.

Tim Hobrough says that the "Carpenter's Glue" which is on the market here and is similar to Titebond is not the same as Titebond. It's the same type of glue, but it's a lot more temperature sensitive, and won't harden properly if it's a little cold (normal winter workshop conditions for most of us) and the minimum temperature seems to be higher than Titebond's, though he can't give any figures. He lets it set by a radiator or in front of a fire.

One of the stands at the Early Musical Instrument Exhibition was that of Heckscher & Co, who supply harpsichord parts. I get asked about such things occasionally, so I thought it would be worth inserting their list here. John Rawson told me that they were the only people he'd come across who sold small reels (100 gram) of music wire. See note on p. 10 D.S.

OFFERS: Malcolm Jones (see this issue for his address) is a music librarian and offers search and access for books, records, music and information to fellow members. He also offers information retrieval and indexing, and says "what about the journal for a start?". Would you like an index to FOM/RIQ? Do we need one, and could we afford it? Let's have your views on this.

We have received two offers of workshop space. Ian Gerrard of Cheltenham Luthiers Workshops, Norfolk House, Well Walk, Cheltenham, Glos. tel:43137, has some individual workshop space available, with a good shop attached. Bob Eyland of Riverside Workshop, Staverton Bridge, Totnes, Devon, tel: Staverton 683, is looking for an instrument maker to share with him and Norman Reed. There is a main room, approx 25'x 26', with a machine room 12'x 22' and a varnishing room and wet-timber storage room each 10'x 10'.

PLANS: Eric Moulder has produced plans of his cornamusen at £14 for sopranino or alto and £21 for tenor or bass, both inclusive of VAT, postage, royalties, etc. Drawings include reed dimensions, staple, keywork and some complete with notes on tuning, voicing and finishing. He says: "In order to enable a high quality instrument to be produced, they have not been simplified to cater for the amateur".
Michael Goater of Pell Howell, Priory Road, Palgrave, Diss, Norfolk (Eric Moulder – see previous page – is in the List of Members) offers plans, a set of 4 drawings including thicknesses, of his division bass viol after the Barak Norman of 1689 in the Royal Northern College of Music, for £12 plus postage (50p in UK; £1.20 abroad).

Mark Ellis (new address in this issue) has recently measured and drawn a viola d'amore in the V&A (no.722-1878). A copy of the drawing, on two Al sheets, with notes has been deposited at the Museum and should be available for inspection there. Further copies are available from him for £6 including postage.

Kenneth Williams offers help in drafting plans; he has sent some ideas on what is desirable in plan drafting as a Comm. herewith.

He says also that the Royal College of Music told him that they had had problems with sending plans in cardboard tubes as they arrived damaged. He suggests "the best way to avoid damage is to roll the drawings tightly round a wooden dowel about 1" diameter. If the dowel is 2" longer than the roll the outer paper cover can be well secured by a tight lashing at each end. The weight is not excessive and it takes a very determined postie to bend it." Sounds a good idea to me and worth taking up.

He also suggests a complete survey of plans (see above on p.7, penultimate paragraph), particularly if each item could be accompanied by a quality rating as assessed by a knowledgeable expert. We have reviewed plans in the past, but only those which have been sent to us for review. Our libel laws are such that if we were to say that a certain plan was grossly inaccurate or unclear or useless to a builder, we'd be sued. I suppose that there is nothing to stop us saying that plans are good (nobody is going to sue us for that), but I would be very hesitant about including any critical comments if we had not been invited to comment by the museum or other publisher. I'd welcome your ideas on this, and meanwhile we would also welcome plans for review from any source, and also any favourable comments on plans that any of you have used. I don't mean "the only thing I can say in favour of this plan is..." but comments on any plans that you think worth recommending to colleagues (with as much detail of price etc as possible; if they are old ones, then please date the price as at least it gives us an idea).

Charlie Barker (again see p.7 above) has started to accumulate a list of plans. So that you can write to the institutions concerned and ask what they have in your line, the Smithsonian has plans of 11 instruments; Nurnberg have 33 and X-rays; Vienna have 44; Brussels Conservatory have 10; Boston Fine Arts have 5. Further and more detailed information will follow.

Luis Esteves Pereira asks me to say that he is at the moment embroiled with restoring an organ out in the country but should have finished by November and will then be back in Lisbon and able to deal with the requests for plans of the keyboards in the Museum.

POSTAL PROBLEMS: I had a letter today from a member in Holland saying that he had not received any issues since the January one. The post office, both in this country and abroad, is always liable to lose the odd copy, and if this happens to you, please don't wait for six months before letting me know. We try to appear before the end of the month of issue (Jan, April, July, Oct) and sometimes we succeed. I'd have thought that if you haven't had yours by the end of the following month, something is wrong (though this may not apply for surface mail abroad – you should have a rough idea of how long it takes by now), and you should let me know. Do allow us till the end of the following month, though; there can easily be delays at this end in producing it, though we do try to avoid them.
OFFERS: (Sorry, I forgot one) Marcel Glover offers help to anyone who needs it on metal-working.

MY MOVEMENTS: If all goes according to plan, I shall be in Sweden next month, Stockholm probably November 29th to December 2nd, and Göteborg December 3rd and 4th. I shall be happy to meet any of our members there; Cary will probably know what I'm doing when and where. Rather advance notice, but I'll be in Israel from February 12th to March 4th and will also be happy to see anyone there.

DEADLINE for NEXT ISSUE: 2nd January 1980.

And if you haven't paid your 1980 subscriptions by then, you won't get the next issue on time. Do please try to pay without a reminder - it makes life a lot easier for us (and we do this job in our spare time) and it also saves a lot of money - printing and postage is so high that we really ought to surcharge late payers.

Jeremy Montagu

POST-SCRIPT: Please do not try to pay for more than one year's subscription at a time. We cannot tell what inflation will do between now and 1981 and it simply makes more work here. We have tried to carry over advance subscriptions in the past, but we can't afford to do it any more.

As in the past, we would welcome an extra payment on behalf of members in countries which forbid the export of money. We have received some good Comms. from some of them, and it is an enormous help for them to be in touch with current research and practice elsewhere and with their colleagues.

BULLETIN SUPPLEMENT. COMPILED BY DJILDA SEGERMAN

HECKSCHER & CO (from p.8) Space is too tight in this issue for us to include things that can be obtained elsewhere. Their address is: 75 Bayham Street, London NW1 0AA; tel: 01-387 1735.

I have also had to leave till next issue a 7-page paper from Eph entitled: A THEORY OF VIOL DESIGN: I GEOMETRY OF THE INSTRUMENT-STRINGS RELATIONSHIP. If anyone can't wait 3 months for it, please send us 30p. for a photocopy.

Eph will be running EVENING CLASSES on STRINGED INSTRUMENT MAKING at the Manchester College of Building starting in January. He'll try to keep it on a professional level for competent woodworkers. Not having formally taught craft before, he would appreciate any advice and teaching materials that members more experienced at this game are willing to offer.
THE GUILD OF LUTHIERS AND PIPEMAKERS

Eph and Djilda Segerman

We recently received a mailing from a new organization - The Guild of Luthiers and Pipemakers, Chester Walk, Cheltenham, Gloucester, who give no phone and no names of organizers, and they don't mention early instruments. The only achievement mentioned is the fitting out of two showrooms with spotlights, carpets etc. They are offering very ambitious marketing, publishing, informational and organizational services to instrument makers for various fees. A detailed set of rules concerning the financial arrangements for makers are given, but no indication of how members might have any democratic say in the affairs of the Guild, as is usual with guilds. Since on the surface they seem to be a private business, we wrote to them with our terms of business for retailers. We received a reply from Iain Gerrard, Secretary, indicating that they do not consider themselves a retail shop. They obviously intend to compete with the established shops offering commission selling to makers instead of outright purchase. This would be cheaper to the customer but the maker needs to wait for the sale before he gets paid. It seems to us that they could be a useful alternative outlet if they sell enough to make payment of the membership fee worthwhile.

NRI DESIGN SERVICE - BORROWING OF PLANS. Ian Theakston and Eph Segerman.

The list of instrument plans shown in the catalogue below is available to be borrowed by members of the NRI Design Service. It is just a start with many more being prepared by Ian Theakston from Stephen Gottlieb's research data. We apologise for the long delay in getting moving. People who joined years ago are still members. Any member of FOMRHI can become a member of the Service by sending £3.00 to the chief librarian. A further financial contribution from members will only be requested when and if it is collectively decided to invest in some of the plans now available which are tending to be rather expensive. Members will be polled on this.

We have chosen to run a lending library on plans of instruments in museums to avoid possible competition with the museums themselves who may intend to sell their own plans of these instruments. The plans issued by museums are generally prettier and rather more complete than the ones we have.

Ian Theakston is the chief librarian and we expect to have sub-librarians in North America and Australia. The sub-librarians will organize tours of the plans in their respective areas to avoid much of the expense and lost time in transport to and from the U.K.

At this stage each request for a plan should go to the chief librarian who will advise on whether it is immediately available and, if it is out on loan, when it is expected back. He will also advise on cost and on whatever limitation he finds it necessary to make on the number of sheets that a borrower can have at any one time.

The charge for borrowing is calculated as follows:

The cost of postage outwards (postage for return is paid by the borrower), plus the cost per trip for the packing tube (i.e. the cost of the packing tube divided by the number of circuits it will take before it becomes useless; our first guess is three
circuits but this is likely to be modified by experience), plus 50p per sheet towards a fund for buying new plans and replacing the inevitable occasional one lost in the post.

The borrower is expected not to mark or damage the plans in any way. If damage does occur compensation will be negotiated with the librarian. The borrower is expected to return each plan to the librarian within one calendar month of dispatch. The librarian will vary the future conditions for that borrower, including possibly a complete ban, if this time condition is not strictly adhered to.

The Design Service is starting a file of who had actually studied which surviving pre-19th century instruments and what kind of information they have on these instruments that they have not already published in some way.

We can imagine that these people fall into four categories 1. Those who intend to polish up their information into a publication and/or drawing to be available to others for little more than reproduction costs, 2. Those with the same intentions but who are intending to sell the information at a price designed to largely pay for the work (an alternative is to trade it for equivalent unique information from others), 3. Those who have no intention of working up their information into a respectable state to send out but don't mind others coming to look at it (and possibly doing the working-up for them), and 4. Those who just want to keep their information to themselves.

It is understandable that people in Categories 1 and 3 who might offer their information to other members would resent those in categories 2 and 4 who would take advantage of their generosity through the Service with no intention of reciprocating. We have been under some pressure to make disclosure of information a condition for receiving Design Service information. This is an impossible condition to enforce, and so we have decided on a more constructive approach.

We request that each member in categories 1, 2 and 3 (who shouldn't mind other members knowing about what they have) please send the chief librarian a list of pre-1800 original instruments he has studied, the type of information on each he has (photos, tracings, measurements, etc.) and which category he falls into. The chief librarian will keep these lists on file and when members ask for who has information on a particular instrument or category of instrument he will use these lists in advising them.

We would appreciate any contributions of plans, other design information, comments on what we are doing, suggestions, etc.

Chief Librarian:
Ian Theakston,
72a Main Street,
Burton Joyce,
Nottinghamshire NG14 5EH
Tel: 0602-31-3714 (Burton Joyce 3714)
DRAWINGS PREPARED BY STEPHEN MURPHY

These drawings were made from tracings, measurements and photos of the instruments some time after the instruments were observed. They were not subsequently checked against the originals, so dimensional accuracy is not always high.

(Codes of pian contents as described in Comm. 232)

SM1 7 course lute by Magno Dieffrpruchar, Venice 1609
(Museo Bardini, Firenze, MI 144)
A (o d 1), C (p d 1), D (o d), E (x w 1 3), F (u 1), H (1 3),
I (p w d), J (t d 1), K (p s x 1), M (p s e d 1 2 5)

SM2 2 drawings
Hans Frei, Bologna (Bologna MC 1597)
A (o), B (p e w 1), D (o)

10 course lute by Michielle Harton, Padova 1599 (Bologna MC)
A (o d 1), B (1), C (1), D (o d), E (x w d 1 2 3 4), F (u w),
H (1 3), I (p t), J (t d)

SM3 8 course lute by Michielle Harton, Padova 1599
(GNM Nurnberg MI 56)
A (o d 1), B (x 1), C (o x w 1), D (o), E (w d 3), F (u w),
H (1 3), I (o x w 1), J (s d 1), K (o e 1), L (p),
M (p s d 1 2 5)

SM4 2 drawings
8 course descant lute by Wendelio Venere (Vienna KHM, C 39)
A (o w d t 1), C (o 1), D (o d), E (w x d 1 3), F (1), H (o 1 3),
I (p w 1), J (s t 1), K (p e 1), M (p s 1 2)

13 course lute by Dieffpruchar/Kdlinger (Vienna KHM, AR 969)
A (o d 1), C (o d 1), D (o d), E (x w d 2 3), F (u 1), H (3),
I (p d), J (s d 1), K (o e w 1), M (s d 1 2 5), N (o)

SM5 2 drawings
6 course lute by Georg Gerle, Innsbruck 1580 (Vienna KHM, A 35)
A (o d 1), B (1), C (o d 1), D (od), E (x w d 3), F (u),
H (1), I (p), J (s x d 1), K (p x l), L (p s), M (p s d 1 2 5)

7 course lute by Wendelio Venere, Padua 1582 (Vienna KHM, C 36)
A (o d 1), C (o d 1), D (o d), E (x w d 1 2 3), H (1), I (o w),
J (s t), K (p), M (s 1)

SM6 7 course lute by Giovanni Heiber (Brussels GRM, 1561)
A (o d 1), C (o d 1), D (o d), E (x w d 1 3), F (u 1), H (3),
I (o w), J (s 1), K (p x l), L (p s 1), M (p s 1 2 5)

SM7 13 course lute by Joh. Chr. Hoffman, Leipzig 1730
(Brussels CRM, 3188)
A (o d 1), C (o 1), D (o), E (w d 2 3), F (u), H(1), I (p),
J (s x w d 1), K (p e 1), L (p w), M (p s 1 2 5), N (p s 1)

SM8 2 drawings
Giovanni Tesler, Ancona 1621 (Firenze Bardini, 154/494)
A (o t 1), B (p x w 1), D (o), E (w 3)

Magno Graill, Rome 1627 (Firenze Bardini, 143/471)
A (o t 1), B (p s x w 1), D (o)
11 course lute by Joh. Chr. Hoffman, Leipzig 1716
(Brussels MICM 1559)

A (o d l), B (l), C (e 1), D (o d), E (x w 3), H (l 3), I (o),
J (s l), K (p x 1), M (s l), N (s)

Archlute by Matheus Buchenburg, Rome 1608
(Firenze Bardini 142/470)
A (o t d l), B (p x w l), D (o), E (w 3), J (p)

Lute by Markus Buedemberg, Rome 1608
(Firenze Bardini 155/490)
A (o t d l), B (p x w l), C (o), D (o), E (w 3), I (o), J (d)

Archlute by Weigert, Linz 17?? (GNM Nurnberg, MIR898)
A (o d l), C (o l), D (o d), E (s x w d l 2 3), F (u d l),
H (3), I (o), J (s 1), K (o x 1), M (p s d l 2), N (o)

13 course lute by Martin Hoffman, Leipzig 169?
(GNM Nurnberg, M1245)
A (o d l), C (o d 1), D (o d), E (x w d f l 3), F (l), H (3),
I (o), J (s), K (o l), O (p d)

Viol by Antonio Cicialiano (Bologna MC, 1761)
A (o x d s t), J (p s), M (s)

7 course lute by Michielle Harton, Padua 1602
(GNM Nurnberg, M144)
A (o d l), B (p x 1), C (o), D (o), E (w 3), F (u w d 1), H (l 3)
I (o x l), J (s d w l), K (o x 1), L (p l), M (p s w d l 2 5)

10 course lute by Magno Stegher, Venice (Bologna MC, 1754)
A (o d l), C (o d l), D (o d), E (x w d 2 3), H (3), I (p w d),
J (s d l), K (p x), M (p s l 2)

7 course lute by Magno Dieffoprochar, Venice 1612
(Bologna MC 1753)
A (o d t l), B (p l), C (o d l), D (o), E (x w 3), H (3),
I (o w), J (s w f)

7 course lute by Wendelio Venere, Padua 1592
(Bologna AP)
A (o d l), C (o d l), D (o d), E (x w d 3), H (3), I (o t),
J (s t d l), K (p x w l), M (p s d l 2)

Archlute by Matteo Sellas, Venice 1630
(Bologna MC 5)
A (o d l), B (p x l), D (o), E (x w 3), H (3), I (o), J (s d l),
O (o), P (l), Q (p s d)

8 course lute by Michielle Harton, Padua 1599
(GNM Nurnberg M144)
A (o d l), B (p x l), C (o x w l), D (o), E (w d 3), F (u w),
H (o l 3), I (o x w l), J (s d l), K (o e l), L (p), M (p s d l 2 5)

Viol by Hainrich Ebert (Brussels CRM)
A (o d t), E (p s d), I (x odd), M (p s d 5)
SM18 2 drawings

11 course lute by Joachim Tielke, Hamburg 1696
(GNM Nurnberg, MI394)
A (o d l), C (o d l), D (o d), E (s x w d 1 2 3), F (u), H (3),
I (o d w), J (s d l), K (p e l), M (p s d l 2 5), N (p s)
11 course lute by Pietro Railich, Venice 1644
(GNM Nurnberg, MI45)
A (o d l), C (o l), D (o d), E (s x w 2 3), F (u), H (3),
I (o w), J (s d l), K (o s e l), M (p s d l 2 5), N (s)

SM19 2 drawings

Lute by Marx Unverdorben, repaired Edlinger
(Prague National Museum, 656/1178E)
A (o d l), D (o d), E (s x w f 3), R (3), I (o), J (s l),
K (p e), M (s l)
Lute by Laux Maler, repaired Edlinger (Prague National Museum
SM20 655/1931D)
A (c l), D (o d), E (s x w f 3)

SM20 Lute by Laux Maler, repaired by Edlinger (Prague NM 65/1408E)
A (o l), D (o d), E (s x w f 3 4), F (u), H (1), I (o)

SM21 Baroque Guitar by Jean Verboam, Paris 1690 (Paris MICNSM E2087)
A (o d t l), B (l), C (o x d l), D (o d), E (s p d t 2 3),
I (o d t), J (s d l), K (o e), L (p), M (p s d l 5)

DRAWINGS PREPARED BY IAN THEAKSTON FROM INFORMATION COLLECTED
BY STEPHEN GOTTLIEB

These drawings have the outlines of the instruments, with cross-
sections and longitudinal sections of the body. There are narrative
descriptions of the component parts of each instrument (covering
dimensions, materials and finishes)

SG1 7 course lute by Giovanni Heiber (Brussels CRN, 1561)

SG2 6 course lute by Georg Gerle, Innsbruck 1580 (Vienna KHM, A35)

SG3 Lute by Hans Frei (Vienna KHM)

SG4 11 course lute by Joh. Chr. Hoffman, Leipzig 1716
(Brussels MICM, 1559)

SG5 13 course lute by Martin Hoffman, Leipzig 1697 (GNM Nurnberg MI245)

SG6 8 course lute by Michielle Harton, Padua 1599 (GNM Nurnberg MI44)

DRAWING OF RENAISSANCE HARP BY IAN THEAKSTON MI59 IN GNM NURNBERG

Drawing showing plan and elevation of this instrument, with internal
details taken from X-ray photographs. Notes on materials and finishes.
QUESTIONS ... from John Connett

SCIENCE AND THE ART OF VIOL MAKING

As a relative newcomer to the art/science of making viols, I should be grateful for advice on the arching and thicknessing of viol bellies. It is generally accepted that these parameters have a crucial effect on the sound of the instrument, but unfortunately it is not sufficient to measure authentic instruments; one also needs to know the physical properties of the wood, which will presumably not be the same now as when the viol was made. The skilled craftsman is said (1) to take into account intuitively such properties as stiffness and density; does he do this by aurally assessing the characteristics of his soundboard (tap tones?) or in some other way? It seems to me that whatever method he uses ought to be amenable to scientific analysis, and in fact such an analysis is given in a recent Comm. (2), in which the tuning of viol soundboards to obtain the ring mode of vibration is advocated, by observation of Chladni patterns. This, I believe, produces the maximum sound output, but is that really what is wanted? It is conceivable that the particular tonal quality the old viol makers aimed for was not necessarily achieved coincidentally with maximum volume.

There is another aspect to the tonal quality of the viol which has not, to my limited knowledge, been mentioned in recent Comm., viz. the interaction between the acoustic properties of the belly itself and the air resonance of the finished instrument, which depends upon the internal volume and the area of the C-holes. This topic was dealt with at length some years ago (3) but only with reference to the violin family, and again an important criterion was taken to be the production of "full, rich, tone". One or two paragraphs were devoted to the viol, where it was stated that "for contemporary performance of the viol repertoire, the old instruments are unsuitable. They do not have the variety of timbre that the violin has taught the modern ear to expect." So much for the current (1962) taste in viol tone. (To digress slightly, this article states that the bass bar originated, in viols, as a strip of wood running down the middle of the top plate to strengthen it, and that one of the early violin-makers moved the bar to one side. No evidence for this statement is quoted. Does anyone know of confirmatory evidence, or when the sideways move took place?)

A report of some similar work, this time on viols, was published more recently (4), but here again, the aim was to produce a viol "having the best results in terms of power, evenness, and ease of playing", although to be fair the author does claim that an "improved" treble retained the authentic tone-colour.

In short, the problem is whether or not science can be used to design a viol belly so that the resulting viol will have a better chance of sounding like the instrument on which it is based than if one merely made a dimensionally correct replica. And if so, how?

References

(2) Eph. Segerman, FoMRHIQ 15, Comm. 206.
(4) Carl Hugo Agren, Chelys, 1972, 22.

QUESTIONS ... from Paul Kemner.

Does anyone know of any references to 'cello-shaped viols, besides Simpson and Talbot, or have any ideas about the type of backs these instruments had?

Where can one get boar bristle suitable for jack springs?
FELLOWSHIP OF MAKERS and RESTORERS OF HISTORICAL INSTRUMENTS

1979 LIST of MEMBERS - 2nd Supplement, as at 9th October 1979

* in left-hand margin denotes a change of address from the main List or first Supplement.

Robin Almond, 19 St. John's Terrace, London W10 4RB; tel: 01-969 0490 (harpichord etc.; R).

A.M.L.I. Central Library for Music & Dance, 26 Bialik Street, POBox 488, Tel-Aviv, Israel; tel: Tel-Aviv 58106.

R.D.Axford, Chelmer Valley High School, Court Road, Eroomfield, Chelmsford, Essex; tel: Chelmsford 440232 (lute, woodwind; M).

Ben Bechtel, 4224 Red Bud Place, Cincinnati, Ohio, USA; tel: (513) 751-1091 (early music consort director).

Bruce Bekker, 222 Winona St., Philadelphia, PA 19144, USA; tel: (215) 843-1891 (keyboards; M,R,P).

* Antoni & Ruth Bonetti, Friedrichs Feldstr. 61, D-6803 Bingen, West Germany; tel: 06203/81392.

Ralph S. Bown, 22 Astoria Court, Esplanade, Scarborough, N.Yorkshire Y01 2BA; tel: 0723-69934 (guitars, lute, mandolin etc; M,R,P).

Pål Bue, Hollendergt. 1A, 4600 Kristiansand S, Norway (ww, P,R, pres; clarinet, P).

Donald Casson, c/o 12 Portland St., Nedlands, WA, Australia, Australia WA 6009; tel: 09 335-5035 (classical ww; R,C,P).

John Connett, Dene Croft, Westcott Street, Westcott, Dorking, Surrey RH4 3NY; tel: Dorking 5822 (viols; M,P).

Conservation News, Dept. of Archaeology, University College, POBox 78, Cardiff CF1 1XL; tel: Cardiff 44211.

* Alan Crumpler, 4 High Street, Leominster, Herefordshire HR6 8LZ; tel: Leominster 3477.

Bruce W. Du Vő, An Spidéal, Co. na Gaillimhe, Éire; tel: 091-83235 (Uill., Northumb., etc, bagpipes, flutes; M,R).

Lyn Elder, Dominican College, San Rafael, California 94901, USA (lute, bowed strings; M,P).

* Mark Ellis, The Music Dept., The Polytechnic, Queensgate, Baddersfield, W.Yorkshire HD1 3DH.

Ann Farquharson, Garden Flat, 52 Elenheim Crescent, Kensington, London W11; tel: 01-229 5597.

Susan Ferguson, 1825 Castellana Road, La Jolla, California 92037, USA; tel: (714) 454-5405 (ren.lute; P).

Martin J. Finn, 7 Northolme Ave, Leeds LS16 5JB (guitar, lute; M).

Eric R. Franklin, 3 Westfield, Panshanger, Welwyn Garden City, Hertfordshire.

Marcel Glover, Norton Cottage, Colchester Road, Wivenhoe, Essex (recorder, crumhorn, perc, M,P; help in metal working).

* Ian Gould, 256 Hockley Road, Hockley, Tamworth, Staffordshire B77 5ET; tel: 0827-28195.

David H. Green, The Aeolian Workshop, 1080 Beacon Street, Brookline, Massachusetts 02146, USA; tel: (617) 734-7415 (all instrs, esp. bassoon, M,R,C,P).

Malcolm Greenhalgh, The Early Music Shop, 47 Chiltern Street, London W1M 1HH; tel: 01-935 1242 (various instrs; M,P).

W. Groeneveld, 82 Dubourg Street, Ocean Grove, Victoria, Australia 3226.

Chris Grooms, 805 Box 54-E, Nacogdoches, Texas 75961, USA (guitar; P).

Michael Heron, Perry Hill Cottage, London Road, Chatteris, Cambridgeshire.

Alan Higgitt, 7 Percival Ave, London NW3; tel: 01-435 0370 (keyboards; M,R).

Eric Jabouille-La Salle, 3 rue Lamennais, 75008 Paris, France; tel: 561.15.07 (theorbo).

Klaus Toft Jacobsen, 37 Pottery Lane, London W11 4LY; tel: 01-727 8943 (ren & bar lute, theorbo; M).

F.B.W. James, Stonelea, Staintondale, Scarborough, N.Yorkshire Y013 0AZ; tel: Scarborough 870003 (keyboards, plucked strings; C,P).
Hein Jansen, Venenlaan 254, 1623 RP Hoorn, Netherlands; tel: 02290 17038 (Irish harp, hurdy-g, bagpipe; M).
* Graham Lyndon Jones, 20 Queen Street, St. Albans, Hertfordshire; tel: St. Albans 53951 (ww general, bassoon, curtail, tr. flute, bagpipes; M,P).
Martin Jones, Rue Pechère 13, B-1338 Lasne, Belgium; tel: Brussels 653 1755 (ren. wind; M,P).
P. Malcolm Jones, 73 Oxford Road, Moseley, Birmingham B13 9SG; tel: 021-449 7139 (home); 021-235 2614 (library) (keybds, reed ww, M, C, P, res; library research facilities offered).
Mike J. Joyce, 101 Southview Rise, Alton, Hampshire GU34 2AR (psaltery, dulcimer; M).
Alastair J. Kellas, Rosemount, Hope-under-Dinmore, Leominster, Herefordshire HR6 0PX; tel: Bodenham 338 (ren. flute; M).
F. D. Kempster, Scott Creek Road, Scott Creek, S. Australia, Australia 5153.
David N. Klaummer, 503 Sumach St., Toronto, Canada M5A 3K4; tel: (416) 964-1405 (ww, viol; M,P).
Ian Laidlaw, 17B Balnakeil, Durness by Lairg, Sutherland (string instrs, esp. plucked; M).
* Francis M. Longmaid, 16 Oakwood Drive, Fulwood, Preston PR2 3LX.
Judith Meier, 23 Menelik Road, London NW2 3RJ; tel: 01-794 9568 (oboe, ren. double reed; M).
Kevin Mercer, 44 Menangle St., Picton, N.S.W., Australia 2571; tel: 046-771-956 (lute, viol; M,P).
Dayton Miller Collection - see Michael Seyfrit.
* Stephen J. Minett, The Lodge, 42 Blenheim Road, Wakefield, W. Yorkshire.
Emil Misek, A-7304 Grosswarasdorf 115, Burgenland, Austria; tel: 02614/4311 (bowed strings, esp. viols; M,R).
Rod Nelson, 37 Coburg Road, Montpelier, Bristol 6; tel: 0272-556565 (recorder; M,P).
John Nicholson, 53 Warwick Park, Tunbridge Wells, Kent TN2 5EJ; tel: 0892-37694 (organs, regals, hurdy-g; M).
Joseph M. O' Kelly, 65A Uporne Rd., London, SW10; tel: 01-351 1762 (lute, guitar; M,P).
* Daniel W. Papuga, Dybwads Gt. 3, Oslo 3, Norway.
Bryan Poynton, PO Box 34, Airey’s Inlet, Victoria, Australia 3221 (lute, rebec, recorder, ren. flute; M).
Malcolm Prior - no known address (viol, lute; M).
* Geoff Ralph, 1 Weaver House, Pedley Street, London E1 5ES.
Franke Roos, D'Avreestraat 13, D-2903 Bad Zwischenahn, West Germany; tel: 04403/2712 (recorder, flute; M,P).
Malcolm Rose, 1 The Mount, Rotherfield Lane, Mayfield, Sussex; tel: 05940-3165 (keyboard; M,R, C, P).
David Royal, 137 Herne Hill Road, London SE24 (lute; M,P).
John E. Sawyer, Dept. of Music, University of British Columbia, Vancouver, B.C., Canada V6T 1W5.
Michael Seyfrit, 404 Kentucky Ave SE, Washington, DC 20003, USA; tel: (202) 546-0632 (oboe, flute, bassoon, M, R, P; curator Dayton Miller Coll).
Lambert Smit, Kerstraat 24, 2901 CN Zuidhorn, Netherlands; tel: 05940-3165 (violin, viola, wind; C, P).
Yaakov Shir - see A. M. L. I. Central Library, Tel-Aviv.
* James Somers, Point d'orgue, Rue Dizerens 7, CH-1205 Genève, Switzerland.
* Barbara Stanley, 44 Cannon Street, St. Albans, Hertfordshire; tel: St. Albans 67089 (ww gen, curtail, kortholt, tr. flute, racket, sackbut; M,P).
Peter Stephens, 11 Bucks Avenue, Oxhey, Watford, Hertfordshire WD1 4AR; tel: Watford 28115 (recorder, flute, keyboard; M,P).
Peter Storm, Hulvejen 6, Søgebung, DK-4735 Hern, Denmark.
John Storzz, Brookside, Hunsdon, Chichester, Sussex PO20 6NR; tel: Chichester 789605 (harpichords, spinet, clavichord; M).
Ian W. Strang, 23 Partickhill Road, Glasgow G11 5EP; tel: 041-334 5239 (ren. wind, brass, lute, cittern, viol).
John M.Symer, 260-D Quinby Road, Rochester, NY 14086, USA; tel: (716) 683-7579 (oboe; M,P).
Kenneth Taylor, Box 208, Gambier, Ohio 43022, USA.
Max Thoursie, Veggagatan 31, S-172 34 Sundbyberg, Sweden (traversi, recorder; M,P).
J.F.M.van der Tol, Hofstraat 30, 3581 TW Utrecht, Netherlands; tel: 030-514953 (hurdy-g, épinitette, lute; M,P).
* Bryan Tolley, 18842 Los Leones Street, Fountain Valley, California 92708, USA.
Pat Unruh, 3357 W.13th, Vancouver, B.C., Canada V6R 2B8; tel: 736-5745 (recorder, bowed strings).
Martin Vincent, 203 High Street, Penge, London SE20; tel: 01-778 2548 (recorder, flute; M,P).
* Kenneth Williams; add tel: 69-5484 (help in plan preparation).
* Dennis Woolley, Tubhole Barn, Dent, Sedbergh, Cumbria; tel: 058 75 361.
* Anatoly Zajaruzny; between Kiev and 94, insert: 2520

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**General Facilities**

Library research facilities: Malcolm Jones
Metal-working: Marcel Glover
Performance Practice: Ben Bechtel
Plan Drafting: Ken Williams

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**Organological Index**

All Instruments: David Green, Malcolm Greenhalgh
Percussion: Marcel Glover
String Instruments, general: Ian Laidlaw
Dulcimers: Mike Joyce  Psalteries: Mike Joyce
Misc. zithers: J.F.M.van der Tol (épinette)
Keyboards, general: Bruce Bekker  FBW James  Malcolm Rose  Ken Williams
Alan Higgitt  Malcolm Jones  Peter Stephens
Harpsichord etc: Robin Almond, John Storrs h,s, Ken Williams, h
Clavichord: John Storrs

Plucked Strings general: F.B.W.James, Ian Laidlaw
Ralph Bown  Martin Finn  Joseph O'Kelly  David Royal
Lyn Elder  Klaus Jacobsen  Bryan Poynton  Ian Strang
Theorbo: Eric Jabouille-La Salle
Guitar: Ralph Bown, Martin Finn, Chris Grooms, Joseph O'Kelly
Cittern: Ian Strang, c
Mandolin: Ralph Bown
Bowed Strings general: Lyn Elder, Emil Misek, Pat Unruh
Rebec: Bryan Poynton  Violin: Lambert Smit
Viols: John Connett  Kevin Mercer  Malcolm Prior  Ian Strang
David Klaussen  Emil Misek  Lambert Smit
Hardy-gurdy: Hein Jansen, John Nicholson, J.F.M. van der Tol

Harp: Hein Jansen

Wind Instruments general: Martin Jones, Lambert Smit, Ian Strang

Woodwind general: Pål Bue, Graham L. Jones, Barbara Stanley

Transv. Flute: Bruce Du Vé, Frauke Roos, Max Thoursie

Harps: Hein Jansen

Wind Instruments general: Martin Jones, Lambert Smit, Ian Strang

Woodwind general: Pål Bue, Graham L. Jones, Barbara Stanley

Transv. Flute: Bruce Du Vé, Frauke Roos, Max Thoursie

Kortholt: Barbara Stanley

Recorder: Marcel Glover, Bryan Poynton, Peter Stephens, Pat Unruh

Organ: John Nicholson

Regals: John Nicholson

Reed Instruments general: Malcolm Jones, Judith Meier

Crumhorn: Marcel Glover

Geographical Index

Australia: Kevin Mercer, NSW, W. Groeneveld, Vict, Donald Casson, WA

P.D. Kempster, SA, Bryan Poynton

Austria: Emil Misek, Burgland

Canada: John Sawyer, BC, Pat Unruh, BC, David Klausner, Ont

Denmark: Peter Storm, Mern

Ire: Bruce Du Vé

France: AMLI Library, Tel-Aviv

West Germany: Frauke Roos, Bad Zwischenahn, A & R Bonetti, Eningen


Dennis Woolley, Cumbr, Mike Joyce, Hants, Eric Franklin, Herts

R.D. Axford, Essex, Alan Crumpler, Heref, Peter Stephens

London: Judith Meier, NW2, David Royal, SE24, Robin Almond, W10

Alan Higgitt, NW3, Joseph O'Kelly, SW10, Ann Parquharson, W11

Martin Vincent, SE20, Malcolm Greenhalgh, W1, Klaus Jacobsen

England: Malcolm Jones, W. Midl, John Storrs, Sussex, Mark Ellis, W. Yorks

John Connet, Surry, Ralph Bown, N. Yorks, Martin Finn

Malcolm Rose, Sussex, FW James, Stephen Minett

Malcolm Prior, Unlocated
Music news to start with. Judging by some correspondence I've had, not all members know of the London Pro Musica Edition, edited mostly by one of our members, Bernard Thomas. Good, clean editions with the minimum of editorial markings, and those always clearly distinguishable, of a considerable amount of Renaissance and Baroque music. Some things are published in score and parts but a great many are score only, with 4 scores (for 4 part music) selling for the price of 3 and so on; there is a lot to be said for playing Attaignant and such-like music from score, which is why they are produced in this way. Translation of texts is provided, and a guide to contemporary pronunciation, as well as some suggestions for performance practice. I have got most of what they have produced and have used it very successfully in all sorts of circumstances, including school bands with modern instruments (and I'm supposed to be interested in authenticity? But I'd sooner play it on clarinets or saxophones than not play it), as well as for the instruments intended. London address is 155 Ferndale Road, London, SW4 7RE; USA agent: Galaxy Music Corp., 2121 Broadway, New York, NY 10023; German, Austrian, Swiss agent: F.Hanssler Verlag, 7503 Neuhausen-Stuttgart, Postfach 1220, W.Germany; Italian agent: Hortus Musicus, IL centro italiano del flauto dolce, Via Lima 9, Roma. The Catalogue (the latest is 1978-9) gives good details of all the music.

Bouwerskontakt: Bouwbrief XIV (or part of it anyway) has arrived. There is a 9 page article on Dom Bedos's square piano and organ, by Wim Krijger. A 2 page note on what seems to be a keyboard action for a dulcimer by the same author. 3 pages on making a profile-cutter and plane for keyboards, by Jan Kalsbeek. A 2 page further note on the Brussels crumhorns by Toon Moonen (see John Hanchet's Comm. herewith; I have asked Toon whether we can print a translation of his article referred to in the last Book News, and John Cousen is working on it in the hope that he will say yes). There should be several other articles, but my copy is defective.

Conservation News: As a result of our entry in the Conservation Sourcebook (a review of which will be found elsewhere in this issue), I was approached by the Editor of Conservation News, and we have agreed to an exchange, at least for the rest of this year. Copies of the News will be housed here in Dulwich if anyone wants to call and see it. It lists a number of courses and lectures, without saying whether they are only for members; if you are interested in any of those that follow, I suggest that you get on to the International Institute for Conservation of Historic & Artistic Works (IIC for short) at 6 Buckingham Street, London WC2N 6EA; tel:01-839 5975, and ask if you can attend.

Meetings etc: Monday 19th Nov., Environmental control & monitoring (at V&A). Thursday 26th Feb, Conservation of Furniture (at Inst.of Archaeology) Friday 25th April, Skin products (no venue yet) Friday 16th May, Health & safety in conservation (at Inst. of Archaeol.) Thursday 22nd May, Conservation of paintings (Nat.Maritime Museum) Friday 20th June, Paper conservation (no venue yet) Friday 4th July, Symposium on conservation of iron & other metals (further information from Conference Officer, Nat.Maritime Museum, Greenwich).
There obviously is a lot that goes on that may be relevant to some of us, and if you are seriously interested, get onto the IIC. Meanwhile, I’ll try to step up the level of exchange, though we haven’t much in the way of meetings to offer them.

There are a couple of reports, one on the Hydrogen reduction of archaeological iron, the other, which might be useful, on storing iron, using a polythene bin with a close-fitting lid and a container inside it for silica gel which will absorb moisture.

FoMRHI Comm. 228

MORE ON TITEBOND

Mark Butler

The L.S.A. seminar at Barrington, Rhode Island, U.S.A. was marred this year by the separation of five lute tops, one bridge, and the utter destruction of a harp. The climate was described by a member from British Columbia as a heavy fog with 90° F. heat. Both Titebond and hide glue failed under these conditions.

This weather is not unusual for the East Coast of the United States, and I have long been using Titebond to glue lute braces as “it is undone with heat - moisture has little effect.” (FoMRHI bull. 11, p.8) Or so I believed. My suspicions were first aroused when I started removing lute tops which were glued on with hot hide glue and had ebony half bindings which were glued in with Titebond. Using moisture but no heat, the bindings inevitably came loose even before the soundboard. Furthermore, I still had the problem of brace ends coming loose from the soundboard. Finally, in the first week of high heat and humidity this year I had two of my own lutes and three by other makers arrive for repair all at once. Two days later a lutemaker in Virginia called to ask what I was doing about brace separation as he had just had three lutes arrive for repair that week.

Doing what I should have done three years ago, I consulted the “Chart of Common Adhesives” in Cabinetmaking and Millwork, an American classic. It states flatly that aliphatic resin glue (e.g. Titebond) lacks moisture resistance.

I have already decided for myself that I will use a boatbuilder's plastic powdered resin glue for bridges and braces. My desire to be authentic is tempered by the fear of becoming a full time instrument repairman. I will of course continue to use hot hide glue to glue the soundboard to the body; annual separation here is preferable to welding the top on forever.

It is perhaps hoping too much to hope that makers in other climates will follow suit. I know that builders on the West Coast of the U.S. simply believe that we on the East Coast don't know how to make a good glue joint. Perhaps if we send every maker a notice of repair every time we are asked to fix one of their instruments they may come to realize that there is a real and pressing problem. Almost a third of my summer working time is now spent repairing other makers' instruments. I have not yet rebelled and told anybody to spend $200 to ship their lute to Europe for repairs by the maker, but the temptation is strong at times. While I approve of hot hide glue aesthetically, I do not wish to reap the practical consequences of another maker's authenticity.

Mark Butler is not a member himself, but writes from James Cox's workshop. Ed.
III. INFLUENCE OF CORK POSITION ALTERATION

A. INTRODUCTION

Quantz was comparing a flute cork with a violin sound-post (I.1. Quantz, Versuch einer Anweisung die Flöte traversiere zu spielen, Fax. Nachdr. Earenreiter,assel, 1953, H.S. I, §10). This comparison is true only partly, because the soundpost is not responsible for the violin pitch. Flute resonance behavior exhibits extremely curious details when the cork position is altered and they should be considered in certain details.

In order to investigate the cork position influence on the baroque flute behavior I have conducted the frequency measurements on the typical instrument. The instrument in question was the flute kept in the Museum of Musical Instruments attached to Leningradian Institute of Theatre, Music and Cinematography - N 472 by the catalogue. I have reported already that by its form and dimensions this flute was identical to well known Hotteterre flute from the same collection - N 471 by the catalogue (FoMRHIQ, comm.170). However, there is no author stamp on it and the question of its attribution is open for the present.

Both flutes (N 471 and N 472) were found formerly in the collection of G. Snoock which had been acquired by Imperial Court Orchestra in 1908. Since that time the flutes are in Russia. In Snoock's catalogue the flute N 472 (N 215 by Snoock's catalogue) is described as the flute in Hotteterre genre (literally citation: Flute de grand format en grenadille, grand anneaux en ébène, une clé, genre Hotteterre). I have defined the wood species otherwise: the middle part and head piece were made of sandalwood (pium ?), cap, barrel and footpiece of grenadille. Even though I do not insist on 100% correctness of my definitions, it is absolutely clear that the head and middle part are not of grenadille. Besides the mistakes in wood species determinations are met pretty often in the Snoock's catalogue. As for attribution one peculiarity is inherent in Snoock’s catalogue - in it only those instruments are attributed which have stamps, marks etc. The flute N 472 has no stamp and its description follows general rule, though setting the fact of likeness of N 471 and N 472 flutes.

The modern museum catalogue describes the flute a 472 as Hotteterre flute copy, however I do not know the investigations permitting to make this conclusion. The comparison of dimensions of both instruments apparently makes this statement doubtful. I have compared the inside profiles of both flutes middle parts. For this purpose the measurements have been conducted on each of the middle parts in four different planes — sagittal (i.e. passing across the centres of finger holes), perpendicular to it – the frontal one and two intermediate situated at the angle of 45° to the former two. This 4 series of dimensions have,
been received by each of the middle parts, on whose base the average diameters on each centimetre of length and corresponds confidential intervals have been calculated. The confrontation of these data didn't show significant differences between the profiles compared ($\chi^2 = 0.31$ by 33 degrees of freedom). In other words the internal profiles of middle parts do not give the reasons to consider that these details have been made by various reamers. The internal profiles of heads, principally cylindrical, have completely analogous deviations from cylindricity. The internal treatment of fingerholes also quite analogous in both flutes. All these facts in certain degree are the arguments confirming in some degree Hotteterre autorship concerning the flute N 472.

By all externall similarity of embouchure holes, their internal profiles have differences, which, in my opinion, represent a serious argument against Hotteterre autorship. However this problem demands a special consideration. Some acoustical differences will be shown below.

The data of acoustical measurements conducted also on Hotteterre flute (N 471) have been used in the article. Finally the data obtained on the flute N 469 by the catalogue have been used. The latter has Naust's stamp. It was before in Snoock's collection. In place of lost original footpiece somebody of former owners has selected to the footpiece from other flute and scrapped off the marks both on the original parts of instrument, now the marks could be distinguished with difficulty and by a special illumination. Perhaps namely by this reason the flute is not attributed either in Snoock's catalogue or in the modern one. I have not succeeded yet in decipherment of the mark at the footpiece, but someone may be sure that this is not Naust's mark. Perhaps the photography in ultraviolet rays would be able to obtain a more definitive answer.

The original details of flute were made of boxwood. The head has four long cracks going from the joint with middle part. The damage is repaired, for that the half of decorated thickening on the socket was turned off and the ring of roughly enough processed horn has been put. The middle part is the best preserved detail although the lower tenon is diminished by the diameter - the change whose necessity was caused by the adjunctment of strange footpiece. The external dimensions of original details coincide well with those of Berliner Naust's flute. (I make the use of occasion to thank Mr. Paul Hailperin and Mr. Karl Uriwohl for sending me the detailed materials on the instrument from the Berliner museum.) The exception is only the cap having the other form than that of Berliner flute (including the cap known by Saks catalogue). This is cylindrical short cap demonstrating, in Bowers opinion (Jane Bowers, New Light on the Development of the Transverse Flute between about 1650 and about 1770, Journ. of the Amer. Mus. Instr. Soc., Vol.III,1977,) the late stages of three-part flute evolution. I have reconstructed the footpiece by the available data. In such form the flute passed the frequency measurements whose results have been used in the present work. Naust's flute has the same absolute pitch height.
as Hotelmetre flute, in any case these flutes are suitable for joint playing. As for playing features of Nauat’s flute, they are excellent. The soft and rich timbre, surprisingly light playing of tones, strong lower notes, very convenient intonation - these are only the most important details.

Methods of data obtained and demonstration used in this article have been described previously (FomHHik, comm. 145, 170 and 181). Seven different cork positions have been chosen - 7, 12, 17, 22, 27, 32, 37 and 47 mm from embouchure centre. On every of these positions five series of optimum frequency measurements for the tones of all flute sound range (from d1 to b3) have been carried out. Besides the data on maximum and minimum frequencies of all bands have been received. The data obtained serve as the basis for the present article.

For the sake of simplification only natural tones are considered here (the concept of "natural tones" is used here in the same sense as in comm.170). The cross-fingered tones are not considered and I can report only that they follow well general regularities. I allow myself one lexical simplification. Below the expression "47 cork" will be used, which should be understand as "cork position at 47 mm from the embouchure centre". Analogous expressions will be used for other cork positions. The diagrams illustrating the text are executed in logarithmic scale. In all cases when the diagrams represent the data on several registers, the diagram of lower register is designated by letter A, the middle one - B and upper one - C. The scale of diagrams by vertical is indicated in cents. The pitch axis corresponds to A=495 cps.

E. CORK POSITIONS AND CHARACTERISTIC FREQUENCIES OF RESONANCE BANDS.

The diagram in Fig.1 represents the characteristic frequencies of resonance bands of a 472 flute tones. Data series, obtained by different cork positions are represented in form of separate curves. The frequencies are compared between themselves, their relation to the pitch axis is not considered for the present. The horizontal axis of diagram is composed by the data series, obtained by the cork 27. Let us note following peculiarities:

1. In each register the lines of separate graph diverge fan-shaped from lower tones to upper ones. This means that in limits of every register for higher tones the changes of cork positions have more considerable consequences than for lower tones. In other words, the effect of cork position change is proportional to effective bore length.

2. In lower register the graph of separate series are situated more compact (Fig. 1a). For the upper register the opposite is true. The tones of different registers...
correspond to different vibrational modes, the higher is the register, the higher is the number of corresponding to it vibrational modes. Therefore the effect of cork position alteration is proportional to the vibrational mode number. 1/

3. The graph 7 and 47 have interruptions in upper register (Fig. IC). This means that corresponding tones in general are not played by such cork positions. Consequently, depending on cork position some vibrational regimes lose their capability to establish.

Three peculiarities enumerated have important consequences and it is necessary to discuss them in detail.

to Jacques Leguy

1. The diagrams in Fig.I permit to elucidate that effect of cork position change firstly is proportional to effective bore length and secondly is proportional to the number of vibrational mode. If, for example, the cork moved aside from the embouchure, then in each of the registers the upper tones are lowered stronger than lower ones, and total flattening proves to be more significant in upper register.

Graphically this expresses in that that treble end of the graph falls quicker than bass one. Roughly speaking the graph is performing rotary motion.

On the other hand in the graphical demonstration method accepted here, the pitch axis has a form of horizontal line, and a change of absolute pitch height expressed in parallel transfer of pitch axis. As far as the graph of characteristic frequencies rotates, only one case is possible (in limits of $\pi$), by which the graph may coincide with some pitch axis. Let us call this case the consent maximum and consider the method of its determination.

The diagrams in Fig.2 shows the positions of the graphs considered above relatively pitch axis $\lambda=395$. In comparison with Fig.I the curve form becomes more complicated. The graph 27, for example, has peaks on e and g and the deeps on fis and dis. The other graphs have analogous configurations. I have already spoken about that characteristic flute tone frequencies could not precisely follow the pitch frequencies, in which the instrument was made (FOMRHIQ, comm.181) and in some extent has considered the causes by which the tonts have higher or lower than the pitch characteristic frequencies (FOMRHIQ, comm.170). In the case in question it is important that no one of graph can coincide with pitch axis completely and we may speak only about that to what extent those or that graph doesn't coincides with it. Thus the consent maximum declared above in real situation is more conveniently expressed through negative category, i.e. try to decide

1/ Earlier benade represented the data of such kind as a continuous function (A.H. benade, I.W. French, Analysis of the flute Head Joint, JASA, Vol.37, n 4, 1965, p.631-682) however a large amount of the facts obtained by me demonstrates a discontinuity in the points of vibration modes change.
which of the graphs in Fig. 2 has discordance minimum with pitch axis in all registers simultaneously.

So far as each of graphs has deviations from the pitch axis it is quite reasonable to believe that those of them is situated nearest to it, whose sum total of deviations has the least value. The sum of deviations is a good criterion if all the curves compared have identical number of points. In given case the curves 7 and 47 have by one point less than the others. Therefore it is better to use the mean deviation, i.e. the sum of deviations divided by the number of them. However, the mean deviation in the case considered also may give a distorted representation. The point is that algebraic sum lying in its base may give not correspond to absolute value of all deviations on account of mutual annihilation of the values with opposite signs. In my opinion, here the most reliable will be the quadratic criterion calculated by the formula (I)

$$d_i^2 = \sqrt{\frac{\sum d^2}{n}}$$

where $d_i$ - mean quadratic deviation obtained with the cork $i$ by the sum of square deviations $d$, observed in all points of the curve divided by the number of these deviations $n$. In such criterion the absolute value of each deviation accumulates in sum total independently of the fact whether the deviations themselves have negative or positive values. Now the problem decision is the finding of such cork position by which $d_i$ has the least value. In the case represented in the Fig. 2 the least value $d=18$ cents has been obtained with the cork 32.

Influenced by some a priori considerations I have chosen the absolute pitch height $A=395$. The decision obtained is valid for this case, but for the present we have no guarantees for that there is no other absolute pitch height by which the smaller values $d$ could not be received, for elucidation of possibilities of such kind I have conducted analogous calculations for the pitches with absolute height $A=393$, $A=397$, $A=399$ and $A=401$ cps. The results are represented in the table I.

<table>
<thead>
<tr>
<th>$A$</th>
<th>7</th>
<th>12</th>
<th>17</th>
<th>22</th>
<th>27</th>
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</tr>
</thead>
<tbody>
<tr>
<td>393</td>
<td>86</td>
<td>63</td>
<td>52</td>
<td>41</td>
<td>31</td>
<td>22</td>
<td>23</td>
<td>49</td>
</tr>
<tr>
<td>395</td>
<td>78</td>
<td>55</td>
<td>44</td>
<td>34</td>
<td>25</td>
<td>18</td>
<td>25</td>
<td>54</td>
</tr>
<tr>
<td>397</td>
<td>70</td>
<td>48</td>
<td>37</td>
<td>28</td>
<td>20</td>
<td>19</td>
<td>31</td>
<td>62</td>
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<tr>
<td>399</td>
<td>62</td>
<td>40</td>
<td>31</td>
<td>22</td>
<td>18</td>
<td>23</td>
<td>35</td>
<td>69</td>
</tr>
<tr>
<td>401</td>
<td>54</td>
<td>35</td>
<td>26</td>
<td>20</td>
<td>21</td>
<td>29</td>
<td>42</td>
<td>76</td>
</tr>
</tbody>
</table>

TABEL 1 (in cents)

Here the columns correspond to different cork positions, while the lines - to absolute pitch heights, by which the calculations have been performed. It is seen from the table I that there is one more value $d=18$ cents - by the cork 27 and $A=399$. Thus the sphere of true consent maximum should lie in limits of cork position 27 - 32 mm, and for the pitches whose absolute height not less than 395 and not more than 399 cps for $A$.

It is interesting to compare these data with the data by Naust's flute (N 465)
TABLE 2 (in cents)

<table>
<thead>
<tr>
<th></th>
<th>81</th>
<th>44</th>
<th>29</th>
<th>16</th>
<th>13</th>
<th>14</th>
<th>25</th>
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</thead>
<tbody>
<tr>
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<td></td>
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</tr>
<tr>
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<td>13</td>
<td>18</td>
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<td>403</td>
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<td>20</td>
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<td>27</td>
<td>33</td>
<td>41</td>
<td>56</td>
<td>84</td>
</tr>
</tbody>
</table>

A-

| 7 | 12 | 22 | 27 | 30 | 32 | 37 | 47 - cork pos. |

There are lower values of $\bar{d}$ in the table 2, than in the previous case. Basing on general sense of the criterion it may be supposed that this evidences more significant intonational perfection of Haut's flute. Thus the criterion in principle may be used as the formal estimate of the instrument. Practically such possibility really exist, if somebody is aware clearly of stochastic nature of minimum discordance criterion.

TABLE 3 (in cents)

<table>
<thead>
<tr>
<th></th>
<th>41</th>
<th>29</th>
<th>20</th>
<th>19</th>
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<td>403</td>
<td>12</td>
<td>23</td>
<td>33</td>
<td>50</td>
</tr>
</tbody>
</table>

A-

| 17 | 22 | 27 | 32 - cork pos. |

In table 3 the data by Hotteterre flute (N 471) are represented. Here the lesser amount of cork positions is considered, in return the data are calculated on the base of more considerable volume of selections (n=30). Let us determine conventionally (at present I do not see the base for more strict definitions) that the musically useable are those cases, by which the value of minimum discordance criterion accounts for less than 20 cents. All these cases are registered in tables 1,2,3. Judging by these tables the region of musically useable cases is wide enough and it is possible managing without interchangeable middle-parts to change the absolute pitch height in the flutes N 465 and N 471 in limits of about one and a half comma. Let us mention also that the comparison of the tables 1 and 3 demonstrates appreciable differences in the resonance organization of both instruments and evidences apparently not in favour of Hotteterre's autorship concerning the flute N 472.

2. The proportionality of cork position alteration effect with vibrational mode number has another important meaning. The frequencies in lower register change slower than in middle one. This results in that octave relationship between the tones of the same name in these registers, which should exist in principle, could not preserve by cork position alteration.
Quantz correctly points to possibility of loss of true relationship between octaves by wrong selection of cork position (cit. comp. H.S. I, §11). However it is not clear from this indication what is from the acoustical point of view the right octave relationship. The more so as Quantz himself (cit. comp. H.S. IV, §15) in other place reports: "... die Octaven etwas über sich schweben". Considering the proportionality of cork position effect to the vibrational mode number first of all someone may imagine the case when cork position corresponding to the discordance minimum simultaneously corresponds to such situation by which throughout all sound range purely octave relationships between characteristic frequencies of lower and middle registers are fulfilled. To check the possibility of such kind let us use the data available at our disposal.

**TABLE 4**

<table>
<thead>
<tr>
<th></th>
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<th>37</th>
<th>47</th>
</tr>
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<td>0.0070</td>
<td>0.0061</td>
<td>0.0034</td>
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<td>0.0066</td>
<td>0.0034</td>
</tr>
<tr>
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<td>0.0043</td>
<td>0.0031</td>
<td>0.0026</td>
<td>0.0003</td>
</tr>
<tr>
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<td>0.0070</td>
<td>0.0062</td>
<td>0.0055</td>
<td>0.0013</td>
</tr>
<tr>
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<td>0.0103</td>
<td>0.0094</td>
<td>0.0090</td>
<td>0.0035</td>
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<tr>
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<td>0.0093</td>
<td>0.0035</td>
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</tbody>
</table>

In the table 4 the logarithms of values by which the ratios of characteristic frequencies of middle register tones to the lower register characteristic frequencies of the tones of the same name differ from 0.3010 (i.e. from the logarithm of pure octave) are represented. The positive values in the table indicate that the corresponding ratios more than 0.3010, i.e. the octave is too sharp, the contrary is true for the negative values. The columns correspond to different cork positions, while the lines - to the tones. Near to zero values are met only in right lower corner of the table, i.e. for the upper tones and by the cork considerably moved off from the embouchure. As for the musically useable case (cork 27), here the middle register has somewhat higher frequencies than pure octaves. The difference has the value of syntonic comma order.

It follows from this that the flute was deliberately designed by its creator so as the characteristic frequencies of the middle register tones would be somewhat higher than the pure octaves of lower tones. In order to play well-pitched notes here, therefore it is necessary to cover the embouchure somewhat more. The timbre by this is deepened and softened, levelling with the lower register, such is the artistic invention of the flute a 472.

**TABLE 5**

<table>
<thead>
<tr>
<th></th>
<th>7</th>
<th>17</th>
<th>27</th>
<th>37</th>
<th>47</th>
</tr>
</thead>
<tbody>
<tr>
<td>$d_i$</td>
<td>0.0027</td>
<td>0.0014</td>
<td>-0.0001</td>
<td>-0.0016</td>
<td>-0.0031</td>
</tr>
<tr>
<td>$e_i$</td>
<td>0.0000</td>
<td>-0.0018</td>
<td>-0.0028</td>
<td>-0.0038</td>
<td>-0.0049</td>
</tr>
<tr>
<td>$f_i$</td>
<td>0.0013</td>
<td>-0.0004</td>
<td>-0.0023</td>
<td>-0.0042</td>
<td>-0.0050</td>
</tr>
<tr>
<td>$g_i$</td>
<td>0.0050</td>
<td>0.0035</td>
<td>0.0021</td>
<td>0.0007</td>
<td>-0.0005</td>
</tr>
<tr>
<td>$a_i$</td>
<td>0.0066</td>
<td>0.0031</td>
<td>0.0004</td>
<td>-0.0024</td>
<td>-0.0050</td>
</tr>
<tr>
<td>$b_i$</td>
<td>0.0036</td>
<td>-0.0007</td>
<td>-0.0017</td>
<td>-0.0046</td>
<td>-0.0073</td>
</tr>
<tr>
<td>$c_i$</td>
<td>0.0097</td>
<td>0.0037</td>
<td>-0.0026</td>
<td>-0.0092</td>
<td>-0.0156</td>
</tr>
</tbody>
</table>
In the table 5 the identical data obtained for Nauot's flute are represented. Here the negative and near to zero values appear much earlier than in previous case and illustrate by themselves the opposite in certain sense artistic idea.

**TABLE 6**

<table>
<thead>
<tr>
<th></th>
<th>d - d_ref</th>
<th>0,0046</th>
<th>0,0059</th>
<th>0,0018</th>
<th>0,0011</th>
</tr>
</thead>
<tbody>
<tr>
<td>dia - dia_ref</td>
<td>0,0000</td>
<td>0,0013</td>
<td>-0,0022</td>
<td>-0,0008</td>
<td></td>
</tr>
<tr>
<td>e - e_ref</td>
<td>0,0004</td>
<td>0,0000</td>
<td>-0,0009</td>
<td>-0,0011</td>
<td></td>
</tr>
<tr>
<td>fis - fis_ref</td>
<td>0,0026</td>
<td>0,0028</td>
<td>0,0024</td>
<td>0,0050</td>
<td></td>
</tr>
<tr>
<td>g - g_ref</td>
<td>0,0045</td>
<td>0,0042</td>
<td>0,0038</td>
<td>0,0026</td>
<td></td>
</tr>
<tr>
<td>a - a_ref</td>
<td>0,0025</td>
<td>0,0029</td>
<td>-0,0002</td>
<td>0,0000</td>
<td></td>
</tr>
<tr>
<td>h - h_ref</td>
<td>0,0017</td>
<td>-0,0003</td>
<td>-0,0034</td>
<td>-0,0046</td>
<td></td>
</tr>
<tr>
<td>cis - cis_ref</td>
<td>0,0002</td>
<td>-0,0032</td>
<td>-0,0056</td>
<td>-0,0077</td>
<td></td>
</tr>
</tbody>
</table>

In table 6 data obtained for Nottetierre's flute are represented. It may be seen that there is more similarity between the data of tables 5 and c, than between the data of tables 4 and 6. This is more interesting as, how it was mentioned in the beginning of the article, the flutes N 471 and N 472 are almost completely identical geometrically - a convincing example of that that the geometry itself does not omnipotent.

"Wishing to know whether the cork is correctly situated try the lower d with middle and upper d. If these octaves are pure, then everything is correct. If the upper d is too sharp, and consequently the lower d is too flat, then shift the cork farther from the embouchure until the pure pitch would be obtained. If, on the contrary, the upper d is too flat and lower d is too sharp then shift the cork nearer to the embouchure..." - such are Quantz's instructions (op.cit., H.S. I, §12). Quantz imagines the lower and upper d as two scales, whose shaft center is attached to the middle d, implying by this that the lower d is more "obedient" to the cork, than the middle d. However, the diagram in Fig.2 and my other investigations show the reverse. The lower d is more indifferent, the middle d is already more "obedient", while the upper d is highly critical to cork position. Moreover this tone has narrow enough band. Therefore it is more correctly to recommend such strategy by the cork position determination which would be grounded on the stability of lower d. It should be find such cork position by which the upper d forms pure double octave with lower d, if the flute is made correctly then the purity of middle d is accomplished automatically. The finer correction may be performed on the base of upper g, which on the one hand even more critical to the cork position, on the other hand - one of the most narrow banded flute tones. For those who play on the copies of Nottetierre or Nauot a flute I can recommend the utilizing of above described results (table 1,2,3).

3. In the diagram in the graph 7 is interrupted at the tone fis, and the graph 47 - at the tone bj. This means that the tones in question generally are not played by these cork positions. The data by a number of other
cases are not considered in the article, however it should be reported here that by the cork 47 the tones gís and a₁ are not played as well, by the cork 37 the tone b₁ is not played, by the cork 17 the tone f₁ is not played. It is not played also by the higher cork positions. Thus due to cork position alteration two "blind spots" are formed in upper register, one of them touches the region of gís - a₁ - b₁ and it is widened as the distance from embouchure to the cork increases. The second - touches the region f₁ - fís and it is the more extensive, the nearer the cork is to the embouchure.

Benade connects the limitation of baroque flute range top with the fact that its cork is farther apart of the embouchure than in the modern flute (A.H. Benade, Fundamentals of musical Acoustics, 1976, p.497-499). The facts described here show that such conception is too simplified. Almost with any cork positions in the flute the harmonics which are not played could be discovered. Those harmonics begin to sound as soon as cork position is changed. Excluding the notes enumerated they are not referred to the musically usable cases.

C. CORK POSITION AND RESONANCE BANDS.

Diagrams in Fig.3 represent the location of upper and lower limits of tone bands relatively corresponding to them characteristic frequencies, here we neglect the fact that the characteristic frequencies change by the cork position alteration. In such conventional concept the characteristic frequencies form the diagram axis. For the sake of simplification only the data by the corks 7, 27 and 47 have been represented, i.e. middle and two extreme cases. The other data coincide well with them.

As the distance from the embouchure to the cork increases, an insignificant enough augmentation of band width is observed (on the average this augmentation, considering that the cork shifts from 7 to 47 mm, accounts only for 0.0055 - i.e. comma). The principal feature demonstrated by the diagrams in Fig.3 is the paradoxical disposition of minimum graphs, by which the band minimum by the lowest cork position - 47mm - occupying the highest position. This means that as the distance to the cork increases, the zone of optimum in the band changes its position and approaches the minimum, moving off from the maximum. In other words by cork position alteration the reconstruction of band structure takes place.

In the Fig.4 the diagrams of band position change relatively the pitch axis A=395 are represented. Here the proportionality of cork position alteration effect to vibrational mode number is especially well expressed. In lower register the bands almost do not change their position, then in upper register the same cork displacements result in catastrophic effects - withdrawal of the whole range regions beyond the limits of the pitch axis. In this a strong enough argument for basing of method of correct cork position selection is contained.

As for small yielding of lower register bands, then here the maxima deserve a special attention. Their graphs
in Fig. 4A are so dense arranged, that practically they lay in limits of one confidential interval. In other words, the maxima of lower register tone bands practically do not depend on the cork position.

The independance of lower register band maxima permit to base also a good method of acoustical documentation of flutes in museum catalogues and analogous sources. The data on original flute frequency maxima may serve as an excellent base for copy tuning permitting to preserve completely the intonational features of the originals.

Felix RAUDONIKAS

MORE ON FREQUENCY BANDWIDTHS OF REED INSTRUMENTS

I am glad that Jacques Leguy find it possible to continue the discussion of comm. 145. I am grieved only that Jacques take my joke with seriousness which I didn't expect at all. It is obvious that Jacques is not one to be trifled with and I express all apologies which I should imply as well as those which I possibly owe, inspite of my effort to be serious.

Jacques fairly affirmed (FOMRHIQ, 13, p. 9) that the band width was modified by the reed characteristics, implicitly confirming also (and this is even more important) that a displacement of bands by pitch was occurring (below he informs of receipt of parallel transfer of whole instrument sound range due to the change of reeds). In other words, it is possible to select several different reeds by which the same instrument would give musically usable sound ranges with different absolute pitch. If I understand Jacques correctly, the method discussed shouldn't be used in such situation, because it is impossible to decide which one of the results obtained should be considered as the problem solution of the original instrument pitch.

However, the matter becomes clear in comm. 207:

"...The reed (s) which gives a good tuning of octaves indicates the pitch... in which instrument was probably played..." So Jacques just cited contradicts Jacques cited above.

If only one reed (s) exist which can give musically usable sound range with the woodwind in question, then only one answer (although not discrete) is possible to the question of the absolute pitch height of the instrument studied. If the alternative described by Jacques in FOMRHIQ 13 is possible (and I consider that is a more realistic point of view) then several different answers are obtained. I don't find a priori foundations to give preference some of these answers and offer all these answers to consider as pertaining to the interval of values where the true answer is determined. At present I can't vote for more considerable competence of pure acoustical methods.

Jacques finds such approach "little artificial" basing his sceptis on the report that the band width may depend on blowing techniques. I have read this information with great interest. However the consid-
ration of band wideness causes has nothing to do with the discussion subject. It is not important why and how much these tones have wide bands, but that they are widebanded in general and this predetermines the widebandness of absolute instrument pitch height.

I would agree to take a reproach in the artificiality of the point of view stated by me, if I could have guarantees that one of the reeds discussed above is identical. I am afraid that even Jacques can't give such guarantees. By the way I note that I don't pretend at all to a reputation of the creator of "the conception of absolute pitch height widebandness". This concept goes without saying, and whatever authorship is out of question.

As for the reeds breaking integer number ratios between the modes, I am ready to agree with Jacques, if he guarantees me that he had never done such reeds for the instruments well studied. At the same time I pray Jacques to sent me his handbook as soon as an opportunity arise. In exchange I promise to forward the description of original mouthpiece of XVII century cornett.

Felix RAUDONIKAS

SMALL PLANES

Comm. 168 (A.F. Young) gave details of fabricating these; it may be simpler for some members to use cast bodies, and this pattern has been very successful.

The pattern was made from 1/4 balsa in four layers, glued up as each piece was cut to shape, with the bottom being the final part.

The sides should be sloped in on the outside about 1/32 and the opposite way on the inside, and the internal corners filled in with plastic wood to a smooth curve.

Finish should be quite smooth with a final dip in polyurethane varnish.

A small jobbing foundry will cast the body in brass or bronze, and the only finishing required will be filing off rough spots, cleaning up the bed for the blade and drilling for and inserting the 1/8 dia. pin for the clamping wedge. The wedge is hardwood and the blade of the original was made by grinding off a section of a standard spokeshave blade to 9/16 wide.
FoMRHI Comm. 231

STANDARDS FOR INSTRUMENT PLANS

Ken Williams.

Previous Comm's. on the subject of Plans have indicated that a number of draftsmen in this field adhere to a very high standard of accuracy and presentation.

However, at present the purchase of an instrument plan involves a risk that the information supplied may be inadequate, unreliable or not clearly presented. Close examination of some plans has revealed not only lack of essential information but also details of construction which without note or explanation differ from other published data on the same instrument.

Some drawings are almost devoid of dimensions and rely generally on scale and where overall dimensions are listed the precise points at which they have been taken is not precisely indicated.

Perhaps the time has come to establish a designation to indicate that a plan conforms to an acceptable standard of information & accuracy.

Ideally the drawing should indicate the present state of the instrument as well as the original state where different & determinable.

Linework should preferably show:

1. Present state of instrument
2. Original do. (by concrete evidence)
3. " " (by conjecture)
4. Position or item recommended by editor or draftsman.

If we include dimensional tolerances and where not possible by line any linear or torsional deflections we may establish that degree of conscientious presentation that is expected of an 'Urtext' music edition.

Deflections are important, there is little point in carefully duplicating a structural design that has been proven faulty.

The formulation of a code of practice for instrument draftsmen seems to have some merit, and perhaps the FoMRHI could encourage the submission of plans for review, allowing the endorsement of drawings complying with the code with the 'FoMRHI Gold Star'.

Also the cost of plans is in many cases very high, with catalogue information confined to a name and a date; the publisher or institution giving outline specifications in their listing might be worth at least a Silver Star rating and would receive the grateful thanks of those interested persons many miles away who can't inspect the originals.

FoMRHI Comm. 232

ON THE INFORMATION IN INSTRUMENT DRAWINGS

Eph Segerman

Accurate copies of surviving original instruments would have to be made if we are to hope to recreate the sounds the original music was written for. Each original instrument is irreplaceable and valuable information useful for future research could be lost if there was damage during handling. Thus very few of the makers intending to make copies should handle and measure the originals.
This presents us with a communications problem. The more information that can be made publicly available about each instrument, the more accurate the copies can be.

On the other hand, many makers today adopt what is probably an authentic attitude towards their craft. This is that they amalgamate information on a new model with design details that they expect will please the players they make the instruments for, plus other details which result from their own instrument-making style and experience. For such a maker, complete information on an original instrument is usually not necessary. Publicly available information about the original beyond what he will happily incorporate into his own model can even be a nuisance because it may put him on the defensive having to justify the modifications he chose to make.

Thus there are makers who require little more in a drawing that the outline and indication of the type and distribution of distinctive decorative detail, while other makers want everything that they could possibly observe and measure themselves if they had the instrument disassembled in front of them.

The drawings that have been available vary considerably in the amount of detail they contain. Whatever the maker's requirements it would be useful for him if he could tell what information a drawing contains before embarking on acquiring or borrowing it.

In this Comm. I outline a code for lutes which in a short space can state the kinds of information included. It does not include any measure of accuracy or comprehensiveness of that information, only if any information of each type is given. I visualize this list of codes as possibly being useful to vendors and lenders and reviewers of drawings for general indication of what are included, and to those who make the drawings as a checklist to help decide on what to include.

The codes list given here is the result of a few hours of thinking of what I would be interested in seeing on a lute drawing. If any reader thinks such a list is useful and worth improving, please communicate your suggestions for modifications and/or additions either directly as a contribution to FOMRHI Q or to me directly. The goal would be to set up some shorthand way of cataloguing what is on a drawing that is generally accepted and used.

In this code small letters identify features of interest on different components of the instrument, large letters identify the individual components and numbers identify features (beside those covered by small letters) that are peculiar to that component. A small letter has the same meaning irrespective of the instrument component (capital letter) that it is associated with, but a number has a different meaning for each component.

How the code can work is illustrated on the Design Service list of drawings elsewhere in this issue. Ian Theakston has applied the code to drawings of viols and a guitar as well as to lutes. It would be preferable for a modified code system to be written for each type of instrument, and this will be done if there is any indication that people find this approach useful.

During proof reading I've noticed a glaring omission in the codes. There should be a small letter, call it 'a', to denote whether actual numerical measurements are given.
CODES FOR INFORMATION IN DRAWINGS.

p  plan drawing as viewed perpendicular to the soundboard plane or
the plane of the component's largest surface
e  end drawing as viewed along the instrument's axis of pseudo-
symmetry or the component's longest axis
s  side drawing perpendicular to p and e
x  sections perpendicular to the axis of e
t  thickness or thickness distribution
o  outline
u  unbent shape or flattened shape of curved surface (usually
obtained by bending paper over that surface and making a rubbing
m  markings related to the construction method
n  most probably a replacement since the instrument's last state
as a standard instrument in a living musical tradition
r  most probably modified by a non-conservative repair
w  material information (usually wood) giving any of :
    species or type; grain orientation; grain density; grain
    straightness; relative widths of grain dark lines; hardness
d  decoration (patterns as well as thickness when appropriate)
giving any of :
    veneers; marquetry; purfling; edging; stippling; carving;
    burning; painting
f  finish, giving any of :
    bare wood surfaces; evidence of tool working; colour, sheen or
other treatment evidence of covering layer; material, colour,
    transparency, UV fluorescence, hardness

CHECKLIST AND ADDITIONAL CODES FOR INFORMATION IN DRAWINGS OF
SINGLE PEGBOX LUTES.

A soundboard   o t m w d f
   1: join line with fingerboard (inc. points)
B soundboard bars p s e(or x), w f l
   1: positions on soundboard
C bridge      p(or o) s e(or x) w d f
   1: string hole centres
   2: string hole diameters
D rose         o d f
E back         p s e x t w d f
   1: rib fluting
   2: attachments (buttons, etc)
   3: number of ribs
   4: inner or outer linings around edge
F endclasp    u t w d f
   1: end positions on A
G inner endclasp u(or o)
   1: end positions on A
H neck block     p s e w f
   1: lower edge on A
   2: cutaway under soundboard
   3: angle of body/neck join
   4: nail information
I fingerboard  p(or o) s x w d f
   1: fret position indications
J neck  s x w d f
   1: shape of rebate for pegbox in s
K nut  p(or o) s e(or x) w f
   1: notch positions
   2: notch shapes
L pegs  p s w d f
   1: diameter variations (taper) of shaft
   2: string-hole diameters
M pegbox  p s x w d f
   1: angle with fingerboard
   2: shape of nut and block in s
   3: thickness of back in s
   4: peghole centres
   5: peghole diameters
   6: x through end-string
   cut-outs from side
N pegbox riders  p s e x w d f
   1: peghole centres
   2: peghole diameters
Z weight
   1: overall weight
   2: point of balance

MODIFICATION FOR TWO-NECKED LUTES (Chitarrones, theorbs, archlutes, theorboed lutes, etc.)
Replace 'M' and 'N' by •.
O second neck  p s x w d f
P first pegbox
   1: cutout in O(p)
   2: cutout in O(s)
   3: x through O at P
   4: peghole centres in O(s)
   5: peghole diameters in O(s)
Q second pegbox  p s x w d f
   1: u around back surface
   2: u around front surface
   3: peghole centres in s
   4: peghole diameters in s
R second pegbox nut  p s e w f
   1: notch positions
   2: notch shapes

MODIFICATION FOR TWO-HEADED LUTES.
Replace 'M' and 'N' by •.
S first (bent back) pegbox  p s x w d f
   1: initial angle with fingerboard
   2: u around back surface
   3: u around front surface
   4: peghole centres
   5: peghole diameters
T second pegbox  p s d x w f
   1: u around back surface
   2: u around front surface
   3: peghole centres
   4: peghole diameters
U second pegbox nut  p(or o) s w d f
   1: nut notch positions
   2: nut notch shapes
FoMRHI Comm. 233

A jig for preparing and gluing lute neck joint

Mark Ellis

This jig assists accurate cutting of the butt joint between neck and neck block, and the alignment of the neck in its correct plane. Additionally it can be used when gluing soundboard to ribs and in preparing the peg-box/neck joint. It is not based on historical methods of lute construction, but it does combine standard woodworking procedure with a technique well known in guitar making. The jig essentially comprises a baseboard which is the gluing jig for the neck/corpus joint; the baseboard is extended to form a mitre box for sawing the lute neck and peg-box angles. The jig can be adapted for a variety of lute designs and no specific measurements or angles have been given on the drawings.

Construction of jig: the baseboard of the jig should be flat and unlikely to warp. 20mm ply or blockboard is suitable; it should be larger than the plan view of the finished lute. Scribe the centreline. At a distance from the edge of the baseboard of about one-and-a-half times the length of the lute neck scribe a line at right angles to the centreline; this line represents the juncture of the corpus of the lute with the neck and is subsequently called the "cutting line". The outline of the lute is now drawn on the baseboard, as follows. With dividers mark on the cutting line, either side of the centreline, half the maximum width of the neck. Align lute half-template carefully against centreline and slide until its width coincides on the cutting line with the exact half-width of neck as previously marked. Draw around lute template to provide the approximate lute outline (the exact outline is determined by the ribs of the lute back when constructed. It is, incidentally, useful to draw a second line - perhaps in a constrasting colour - 5mm outside the approximate lute outline, so that, even if the ribs are larger than the template, it is still possible to determine the discrepancy from the template). Repeat for other side. The neck should also be marked out. (See diagram A.)

Next the baseboard is marked out and cut. First, draw the baseboard outline 20mm outside the approximate lute outline. Then scribe two lines, either side of the neck outline, parallel to the centreline and at a distance from the centreline 20mm greater than the maximum half-width of lute neck. Cut carefully down these two lines until they meet the baseboard outline and then cut around the baseboard outline. This can be done with panel saw and then coping saw, or with bandsaw throughout. Cut out centre of baseboard, allowing 50 mm inside approximate lute outline and 75mm from cutting line.
The mitre box is now constructed. The two mitre-box sides (of the same material as the baseboard) are screwed to the edge of the baseboard parallel to the centre line (see diagram B). The height of the sides depends upon the maximum cutting depth of available back-saw. The ends of the sides nearest the lute outline should be shaped to meet the outline. The other ends may be left square. Cardboard or formica templates are needed of the neck/corpus joint angle and the peg-box angle. Exactly where the cutting line meets the mitre-box sides mark the neck angle (sloping away from the lute outline) on the sides. Similarly, deriving location from the outline of the neck, mark on the sides the peg-box angle and angle at end of neck (the latter is usually a right angle). Also mark on the sides the top surface of the baseboard. Unscrew the mitre-box sides. The angles marked now have to-be cut to the level of the top of the baseboard. Cut carefully, with a dovetail or fine tenon saw, on the lines to about one-third thickness, then complete with panel saw.

The jig is completed as follows: replace mitre-box sides and check operation with a deep tenon saw in mitre-box guides (a good panel saw could be used). Into remaining exposed edge of baseboard at 40mm distance drill for 20mm roundhead woodscrews and insert screws leaving 5mm proud. Drill three holes in baseboard surface on centreline: x and x' at one-third and two-thirds neck-length from cutting line, and y to coincide with neck block on rib side of cutting line.

Use of jig: for accuracy of jointing and good gluing try to complete joint in single work session. The lute back (the rib construction) should be complete with neck block. The outer ribs (that is, ribs one and nine in a nine-rib lute) have to be trimmed to produce a plane surface for joint with soundboard. (This is often accomplished by planning down ribs to level of lute mould. If a mould has been used it may be left in the back until a later stage.) Place back face downward on baseboard, and stretch a couple of elastic bands over it, using the protruding roundhead screws as anchors for elastic bands. Now, aligning centreline of back to centreline of board, slide back until it crosses the cutting line at the exact maximum width of lute neck as marked. When alignment is correct stretch several more strong elastic bands over lute back. Then from underside insert 25mm woodscrew through baseboard into neck block. Check centreline alignment, and width at cutting line. Clamp baseboard to workbench. With tenon saw in mitre-box guides saw neck angle through ribs and neck block. Cut cleanly by moving saw fast with little pressure. (Note that the saw should not coincide with screw in neck block because screw is other side of cutting line.) Unclamp baseboard. Remove back. If cut is clean no further finishing is necessary.
Plane one surface of oversize timber for neck. This surface will eventually be underneath fingerboard. Check flatness across diagonals. Place this surface downwards over neck outline on baseboard and screw to baseboard through holes x and x'. (The holes are later covered by fingerboard.) Again using mitre box guides, saw neck angle. (It will now be seen that any inaccuracies in the original angle of neck block are compensated for by using the same saw guides to cut neck angle also. The mitre box should continue to be accurate if the saw is not allowed to cut into saw guides. In practice, all wooden mitre boxes eventually have to be renovated, in this case only the sides need be replaced.) The end of the neck is now sawn using the right angle guides. The peg box angle is sawn only to required depth; to ensure that this cut is not too deep plywood protectors of the appropriate thickness (for example, 4mm) are placed inside the mitre box either side of the neck; the cut is made down to these protectors.

Replace back on baseboard; hold down with elastic bands and ensure correct alignment at centreline and cutting line. Project outline of corpus onto base of neck. At other end of neck transfer centreline from baseboard to neck. The neck is now removed and shaped. First complete peg-box joint with cut parallel to plane of fingerboard. The centreline can now be marked on the flat surface of neck by connecting mark of centreline transferred from baseboard, to centre of projection of joint at other end. Mark fingerboard outline on neck and cut down sides. Reduce profile thickness with saw and then prepare parabolic section of neck with saw, plane and rasp. A useful holding jig for this stage is shown in diagram C. It is "T" shaped in cross section and relocates with holes in neck from x and x'; this jig is itself held in the vice. At the thickest end reduce to line projected from corpus; at peg box end work to template or by eye. (When neck is finished the peg box may be attached. Alternatively this may be left until neck joint is complete.)

If mould is used it should now be removed from back. Rescrew finished neck to baseboard. Replace back on baseboard (with elastic bands only); align carefully with neck. The neck could be about 0.5mm oversize and this excess can be removed after joint is complete. Ensure corpus/neck alignment is correct. Band down back very firmly. The large cut-out from the centre of the baseboard allows access to the neck block even when back is secured to baseboard. Drill through neck block into neck to take two 70mm countersunk woodscrews (one each side of centreline, some lutes use only one screw, others, of course, use none). The screw holes should be prepared carefully, with various sizes of drill, to ensure that the joint is strong and that the neck does not split. When the joint is satisfactorily prepared it can be dismantled and then reassambled on the baseboard, this time using glue. The region around the cutting line can be lightly varnished or waxed to prevent the joint sticking to the baseboard.
A. Plan of Jig

- Location of neck block
- Cutting line
- Baseboard (20mm ply)
- Centre of baseboard removed
- (x x x') holes in baseboard (for screws affixing neck to baseboard)
- (y) hole in baseboard (on "rib" side of cutting line for screws affixing base to baseboard)
- Machine screws in edge of baseboard (40mm apart, 3mm protruding)
- Approximate outline of hole

B. Sketch of Miter Box

- Pegbox angle (sawn cut)
- Neck angle (sawn cut)
- End-of-neck angle (sawn cut)

C. Sketch of Jig for Holding Neck

- Base (held in vice)
- Hole for screw into flat surface of neck (locate as for x x x')
PARCHMENT ROSES.  

Ian Theakston

Over the past few issues of the Quarterly I have noticed a number of requests/queries for parchment roses - these are my findings so far.

Materials.

Suppliers of parchment are William Cowley, Parchment Works, Caldecote Street, Newport Pagnell, Bucks., MK16 ODB. They supply parchment in a sheet (approx. 5¾ sq. ft. for £13.50 in March 1979). They supplied the thickness to match some thick paper I sent them; the thickness that I've been using is approx. 0.6mm.

Cutting.

As mentioned in previous comm.'s, cutting edges give straight cuts whereas punches tend to 'dub over' the edges; this seems acceptable for small parts of a pattern. I had a punch made by a local jobbing metal-worker, for the small Ø shape; this does an admirably quick and clean job. For anybody with the skill, time and patience, this was made thus:

(a) 10 mm. steel rod drilled with 1.5 mm. holes thus: 
(b) slot cut thus: 
(c) outside waste removed: 
(d) hardened and tempered: 

A square edge is left on the pattern (i.e. not a bevel edge), and consequently a hard backing is needed to punch onto (I use a block of rosewood or a piece of hard nylon).

Curved shapes can be cut with a scalpel (Swann-Morton no.11) or by making a small tool to the required shape. I have made these in two forms; both use half of a safety razor blade split thus:

The first method is to make a dowel shape to the cut required; cut a rebate at the end of the dowel to stop the blade riding up during cutting, and bind the blade to the dowel with strong thread (e.g. cobbler's thread); cut off any excess razor blade.

The second method is to cut the required shape out of a piece of perspex-type material, and to spring the blade inside this shape. In both cases, the tool is used as a punch with a softwood backing.

Gluing.

The critical consideration for gluing seems to be to leave the parchment flexible and use a flexible adhesive; thus, do not clean the parchment with a solvent to remove waxes etc. To make a suitable adhesive

(a) put a heaped teaspoonful of cornflour into a screw-top jar with 2 fl. ozs. of cold water and shake the jar until thoroughly mixed. 
(b) bring this mixture to the boil, stirring continuously, and boil for about five minutes (still stirring). Boiling is important - ask whoever makes your gravy! 
(c) if required (mainly for colouring) add about 5 drops of hot Scotch glue and mix thoroughly (I have successfully made this without Scotch glue).
(d) the ideal consistency (for me) is as a thin jelly; the glue may be thinned by adding hot water, mixing and re-boiling, or thickened by mixing further cornflour with a little water, adding to the glue and re-boiling.

(e) allow to cool (does not need to be cold) before use. This adhesive sets to a translucent white colour (Scotch glue darkens it) which blends well with the usual parchment tone; if kept in a closed jar will last for about 3 days.

Sandpaper the parchment at the points of contact (using 4/0 or 5/0 Garnet paper) and apply the adhesive fairly liberally (excess may be wiped off for about 15 mins. after application). Hold the glued pieces in position for about 1 hour. I use a series of 'straps' of fairly thick paper held in place on a cork backing board with pins. For joints at right-angles (e.g. the separators of layers in a multi-layered rose) the vertical pieces can be double thickness (where the design allows) and/or thin tissue paper may be glued over the hidden side of the joints.

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PARCHMENT ROSES.

Parchment Roses: The problem of cutting parchment roses is similar to that of making Indonesian Wayang puppets, which are made out of very thin leather and also have many odd-shaped holes cut in them. A Balinese craftsman showed me how it is done: Chisels are made from steel about 3-4mm diameter. The ends are hammered flat, they are tapped to shape and filed, then hardened. The curved chisels cover no more than 1/8 diameter of a circle. These tools are left without handles, and tapped with a mallet. The leather is placed over a very hard backing, which leaves clean edges. When a line or arc is cut that requires several cuts with the same tool, it is tipped so that one corner rests in the hole it has just made, and slid to its next position. This avoids the rough edge which would result if the tool was lifted out of the work and placed over new territory. I tried to cut out parts of a Voboam design with the Balinese method, and it took much less time and the results were far better than my efforts with a scalpel.

Paul Kemner
The Collection of Ukrainian Folk Instruments at Kiev

Anatoly Zajaruzny

The value of the Ukraine takes second place amongst the republics of the U.S.S.R. and its history numbers ten centuries. The history of musical culture of the Ukraine is very interesting and rich. The main museum that collects Ukrainian folk musical instruments is the Museum of Art, Theatre, Cinema and Music of the Uk.S.S.R. in Kiev, the capital of the Ukrainian S.S.R.

This collection is not very large; a little more than 300 instruments, but it offers all kinds of Ukrainian instruments with sufficient completeness. The collection of banduras is the most interesting one. This is the most typical instrument of the Ukrainian people; there is no similar one in other countries. (See A.C.Baines, European & American Musical Instruments, fig.196 - London, Royal College of Music 286 - where it is called "Russian bandura". This ascription is mistaken; it should be "Ukrainian bandura"). There are about 50 banduras at the museum, from the 18th century to the present day.

The collection of lira (hurdy-gurdy) is of interest too. The oldest lira (18th century) is from the personal collection of the famous composer N. Lysenko, who was the founder of classic Ukrainian music in the 19th century. There is a big collection of folk woodwinds, with reeds and mouthpieces \( \text{i.e.} \) the collection includes wooden "brass" instruments; \( \text{jm/} \) pipes, double pipes, horns, both diatonic and chromatic systems, with lengths from 100mm to 4m; total number over 70.

Also we can see cimbaly, folk violins, enough rare table-like gusly (19th century), and all kinds of modern concert Ukrainian instruments.

Besides these, there are some instruments which have value as memorable things that were belonging to famous performers such as Kushnerik, Movchan, Panchenko, Kabachok and so on.

I think it will be useful for my colleagues who take an interest in folk instruments to get to the Museum if they are going to visit the U.S.S.R. The Museum is situated on the territory of the famous Kievo-Pecherskaya Lavra. Leonid Cherkassky is its curator. I will be happy to help members of our Fellowship to become acquainted with the instruments of the Museum, the more easily because I work at the Museum as a restorer. It is a pity that there is no catalogue of our Museum as yet; Leonid Cherkassky and I are beginning to compile it. But meanwhile, if anybody is interested in some Ukrainian instruments, I am able to get him photographs from all sides, correct sizes, plans, descriptions and so on.

\[ \text{JM adds: apologies if I have misread Anatoly's handwriting and spelled any names wrongly. Referring to the second paragraph, this ascription to Russia probably arose from our habit of equating Russia with the U.S.S.R. We need to try to remember that the Russian S.S.R. is only one of the many Republics which make up the U.S.S.R. We are rather in the same position as we would be if we referred to everything American as Californian or New Yorkian. One reason for it is that we have no adjectival form for U.S.S.R. in the way that we have American for U.S.A. (and in fact that usage infuriates most of the inhabitants of the other nations on the American continent)}\]
There are two basic types of acrylic available as dental materials, cold cure and heat cure. Cold cure is the same as heat cure, with the addition of a 'trigger catalyst' to the monomer (liquid), usually a tertiary amine, eg dimethyl-p-toluidine. Both are powder/liquid systems and the principal difference occurs in the method of polymerisation. The finished material in each case consists of a matrix of polymerized monomer (liquid) around particles of polymer (powder). The liquid is methyl methacrylate monomer with the addition of:

- a) an inhibitor (usually hydroquinone 0.005%) to stabilise it.
- b) a cross-linking agent (usually glycol dimethacrylate 1.2%) to reduce the solubility and increase the dimensional stability.

The powder consists of polymethyl methacrylate ground fine, plus:

- a) an initiator (usually benzoyl peroxide or lauryl peroxide 0.02% to 1.0%) to start things off.
- b) a plasticiser (dybutyl phthalate or triphenyl phosphate 2.7%) to improve resilience.
- c) colour agents when needed (titanium dioxide, zinc oxide, iron oxide).

Precautions: The monomer is volatile and a fat solvent (this means it can behave as an anaesthetic). It is also flammable, and the merest speck of polymer will polymerise it. So use adequate ventilation and care.

Polymerised resin absorbs water, but this should not be a problem (it expands on the absorption of water); it is soluble in alcohol - this may be important.

Mixing and use: Place a small quantity of liquid in a rubber/glass container (this enables one to reuse the pot). Proportions are variable between pouring consistency and dough. The mixture progresses through a number of stages: wet sand - runny - stringy - dough. It can be used after the runny stage, but some procedures are better with the dough. The difference between the two materials now becomes apparent. "Heat cure" needs to be heated in a water bath under pressure, whereas "Cold cure" sets at room temperature, but ideally should have pressure applied. For simple castings a thickish mix will be adequate. If you need to lathe-turn the material it would seem best to apply pressure whilst polymerisation occurs; this increases cross-linking (details available if anyone wants them).

Moulds: The "lost wax" process is ideal - carve wax pattern - invest in art plaster - boil out wax - let cool and paint with "cold mould seal" (Sodium alginate solution, comes with cold cure) - pack - process. The finished material is carvable with sharp instruments, files, sandpaper. Polish it with pumice/water and put high shine on with proprietary paste (metal polish does - tooth paste also works but is slow). Colours are usefully obtained by grinding Perspex of a suitable shade into the powder (start with clear). Ivory shades are available as such; crown tinting shades are useful (with these brown patches or lines can be added ad infinitum).

In the musical field I have rebuilt two saxophone mouthpieces using multi-part moulds in plaster - they are played professionally and are still going four years on. Reason for repair was 20-plus years use and almost bitten through; first repair was pink! By adjusting powder/liquid ratio, the density of the repair was matched to the original plastic. I also have a bass recorder with a pink mouthpiece - rush job that continues to serve - the same bass has gold soldered keys, but that's a different story.
Odd as it may seem to readers of Comms 216, 217 and 218 it would appear that Eph, Martyn and myself are agreed on the kind of instruments we would ideally like to see in the hands of lutanists.

Last summer I met a German student who dearly wished to play the lute. He went to a course on lute playing and was told by his tutor that unless he was prepared to spend at least £1000 on an instrument he might as well forget about lute playing. This is an instance of the kind of situation that is going to deprive early music of many potentially talented musicians. Makers will, as a result, lose potential future customers.

The big problem, then, is to produce cheap lutes for people who are unable (or unwilling) to part with the best part of a thousand quid for some masterpiece they might not be able to play. As Eph says, the over-simplified over-priced basic instruments don’t really solve this.

I would like to suggest that the following features are what the customer for a cheap lute would like:

1. An instrument that looks like a real lute (with decent rose, wooden back etc.)
2. A nice finish (like most cheap guitars have.)
3. Reasonably easy to play.
4. Reasonably loud.
5. Structurally sound. (No bars working loose, bridges flying off etc.)

In order to produce these features at a reasonable price, the makers must be geared for a certain degree of mass production. This necessitates more in the way of jigs and special tools which in turn demand that the design must be very standardised.

It might be argued that such a set-up would demand a great deal of investment. I disagree. Anthony Rooley tells us (Early Music Gazette, January 1979, p9) that Gamil Georges’ oud shop, in Cairo, turns out four or five instruments a day with a staff of eight. I suspect that this shop uses pretty traditional methods of construction. Judging by the vast numbers of partly built lutes in Laux Maler’s workshop at the time of his death, one would suspect that his methods were closer to those of Gamil Georges than to those of any Western lute maker today.

Many problems will have to be solved before we can attempt to emulate such production methods. Success in such a venture could lead, in turn, to a great expansion in the business of those makers producing custom-built masterpieces. NRI are to be praised for their efforts in this direction.

The identity of soundboard wood - I’d like to thank Eph for his research into the identity of the opaque wood used in old soundboards. I wait to be convinced that Swiss pine can be treated to reduce its opacity.

Semicircular backs - The back of the Venere lute on which Philip Mcleod-Coupe’s drawing is based differs from a semicircle (cross-section) by no more than about 5mm. I wait to be convinced that this affects the sound by any significant amount.
I have recently begun to take an interest in reed making, and had the good fortune some time ago to have a sort of tutorial from a maker of fine Northumbrian small pipes during which, in the course of two hours or so, I made what he declared to be a serviceable chanter reed. I would not call myself a reed maker on the strength of that afternoon’s work, of course, but as the methods used for the chanter reed differ in some respects from those described by Meyer and Kottick I hope that a brief account may be of interest and elicit further and better informed discussion of this interesting topic than I can offer.

The small pipes reeds are unusual in that they operate dry; the maker is enjoined always to test a reed by sucking through it. Whether this makes any radical difference to the method of manufacture I do not know. They can be made by a wet process, much as the Comm. describes, in which case they must be left for several days to dry out before voicing, or by a dry process which my mentor preferred, as it is much quicker. The wet process is described at length, and the dry process briefly, in 'The Northumbrian Bagpipes', by W A Cocks and J F Bryan (Northumbrian Pipers Society, Newcastle-upon-Tyne, 1975); my mentor's method differed in some ways from that given in the book, and what follows is based mainly on what he told me.

The chanter reed is about 7/16 in. wide, parallel sided, and is mounted on a short staple about 3/16 in. diameter made slightly oval at the reed end. The cane used is about 1 in. diameter, gouged and sanded to a uniform thickness of about 1/32 in. Before cutting, the cane is scored across as Meyer and Kottick describe, and also nicked at the edges; this lessens the risk of splitting. The ends of the cane are shaped as shown; the curve is not critical but all four curved edges should have the same shape. The sketch shows the position of the staple relative to the ends of the reed blades, which are bevelled so that the wrapping beds down on to the staple. When the blades have been shaped the control wire is fitted near the free end to help keep them in place while the wrapping is done; one turn of about 22 SWG (.028 in.) wire is used.

Thin hemp rubbed in black wax is used for the wrapping, which is close wound from just beyond the tips of the blades up to just beyond the end of the staple and finished off with a few criss-cross turns to hold it in place. The wire is then pushed down to just above the wrapping. Finally the wrapping is coated liberally with shellac, and may be warmed to drive off the meths quickly. The shellac mixes with the wax to give a slightly flexible coating.

The last stage is to scrape the blades so that they both taper equally to the tip and are thinner at the edges than at the centre. Some makers take the extreme corners off the tips, which makes them less vulnerable to accidental damage.

I have deliberately given only a bare outline, to enable some comparisons to be made with Meyer and Kottick. There is clearly a great deal of skill and experience involved in getting a reed that will work properly over the full compass of the chanter (up to two octaves), but the method seems essentially simple and the materials have a traditional look about them (though where did early reed players in Britain get their cane from?). I should be interested to know how the method I (or Meyer and Kottick, for that matter) have described compares with those used by traditional reed makers elsewhere or in the past.
Research into the nature of early instrument varnishes has been continuous for many decades. Comparatively recently, William Fulton published a method which seems more likely than most to have been that used by the 16th and 17th c. makers. Essentially, he produces the dark colours usually so difficult to obtain in an oil varnish, not by adding them to the varnish as is usual, but by heating the resin to higher than usual temperatures. Earlier this year, Eph Segerman introduced me to both Fulton's descriptions of his method and to samples of a varnish made by W.R.I. based on them. The convincing things about the method are that it is easy, so that anyone can do it - although minor variations may well produce a better or a worse varnish or a different shade ( the Hills, in their book on Stradivari, quote a letter of 1726. "The celebrated lute-maker Sigismond Maler has promised to give me in writing by Monday next the recipe of the varnish he uses, as well as the manner of putting it on the lutes. This master also tells me that he has two kinds of varnish, and that it is his assistants, not he himself, who make it") - secondly that it is easy to apply - easier than any other coloured varnish that I have met - thirdly it fits contemporary descriptions by requiring sun or ultra-violet light to dry, although it then dries easily and quickly.

Various recipes that I came across recently seem to confirm Fulton's general method whilst possibly modifying it in detail. Ridiculously enough they have been in print in modern translations since 1847 and 1849. Perhaps the fact that they occur in books on artist's methods and materials has led to their not being noticed despite their similarity to other recipes contained in Heron-Allen.

The painter Gentileschi, who painted the work in the Liechenstein collection known as the "Lute-player" about 1525, and who was known as a capable musician, later living in England, is quoted by Eastlake as saying that in his time all the colour-vendors in Italy sold the amber varnish used by the varnishers of lutes. However it seems that the word amber was usually descriptive of the colour and not of the material from which the varnish was made. Eastlake's book is almost entirely concerned with the technical development of oil painting, and with the early use of varnishes mixed with the oil to promote drying as traditionally introduced by the van Eycks. Obviously the painter's problem was to produce a pale varnish, and it is to the common varnish recipes and to elements in their making that the artist might regard as undesirable that we must look. It seems that by about 1500 the word for varnish - vernix - had been transferred from the mediaeval Greek word meaning amber, veronice or berenice, firstly to the varnish which had the colour and transparency of the fossil resin, the vernice liquida, and then to the sandarac resin from which that varnish was usually made. Amber itself could be and sometimes was used in varnish from an early date (vernice liquida gentile) but was generally too expensive for common use and gave a darker varnish than other resins.

Sandalac was apparently the resin used for the cheaper red varnish - vernisum rubeum - mentioned in the Westminster accounts during the 13th and 14th centuries. In Italy it was sometimes called grassa (amber was glassa or carabe) but most usually as vernix or gum juniper. It was believed to be produced by the juniper tree or thuja articulata, but is now known to come from the Alerce, calitris quadrivalis, in North Africa. It is a hard and brittle resin which gives a reputedly dark varnish.
The considerably more expensive white resin mentioned in the Westminster accounts was probably mastic which occurs in Italian recipes from the beginning of the 16th c. Mastic comes from the Pistacia Lentiscus, a tree which grows in all countries bordering the Mediterranean. Although fairly brittle, it softens at a low temperature and is used as a chewing gum. It gives a paler varnish than sandarac (vernice chiara).

The third resin, possibly a cheaper white resin used at Westminster, is turpentine resin, produced by heating gum turps, the sticky exudation of various pines. At the present time it is used to make turpentine and rosin. When prepared it was called Greek pitch — pece greca —, pegola, or glorie. The following recipe comes from a ms. at Mount Athos, originally written by one Dionysius about the 11th c. but added to up to the 16th. quoted by Eastlake from an earlier (1845) translation into French.

"Take fir resin in the quantity required; place it in a copper vessel (which it should only half fill), and set it on the fire. Take care that it does not run over; if you see it rise, remove it from the fire and blow on it with a reed, or place the vessel in another that is full of cold water; this instantly stops the tumefaction. Replace it on the fire, and repeat the operation several times, till the resin ceases to swell. Thus pegola is prepared. Remove it from the fire, and pour it into a copper vessel full of water, ready for the purpose. Afterwards gather up the pegola and preserve it".

"The translation could also be pine.

This product is rosin, although still containing impurities. Modern opinions differ considerably on its usefulness in varnishes. "Paints and varnishes which contain rosin are weak, not durable, they will always turn dark and crack, and are so generally inferior that although rosin is used in large quantities for cheaper products, it is considered an adulterant in some industrial paint and varnish finishes". (8)

"By itself it leaves rather a hard brittle and lustrous coat, but tempered with some oil or soft resin it makes a durable varnish". (9)

Its earliest use in Italy seems to have been in mixtures with sandarac which it assisted to melt. Later it became used on its own as the resin ingredient of the common varnish (vernice comune). It gave gloss and a paler colour.

These three resins, sandarac, mastic and pine resin, together with linseed or walnut oil are those most commonly occurring in the recipes collected by Eastlake and Mrs. Herrifield. From about forty or fifty recipes I have selected those that I thought most relevant.


"To make Painter's Varnish.— Take of linseed oil 4 oz., boil it in a copper vessel, renewing the scum as long as it forms any; then take 1 oz. sandarac in grain (i.e. the solid resin, untreated) and put it in another vessel, with a little of the aforesaid boiled oil in the bottom. Let it boil, and continue to add the oil, little by little, until you have poured in all. Let the ingredients still boil, for the more they boil the better; and take care that the fire does not reach the oil. This is a good varnish for varnishing whatever you please".

Another recipe uses pulverised sandarac, which experiment suggests was heated, solidified and ground, added to the boiling oil together with pece greca (turpentine resin).
Also: "To make Vernice Liquida.- Take of solid sandarac 1lb., linseed oil 3lb., pece greca 3lb.; this will be good for varnishing cross-bows. A similar recipe adds, " in order to know when the mixture has boiled enough, place a little on a knife, and if it remain thick, and somewhat firm, the varnish is made."

Further detail comes from a German ms. (Strassburg public library, A.VI.19) "Let the varnish seethe gently with a moderate heat, stirring it continually that it may not burn; and when you find that the composition has become thick, like melted honey, take a drop of the varnish on a knife, and, after suffering it to cool a little, touch it and draw your finger slowly off; if the varnish strings it is well boiled, but if not, boil it better till it strings. Then take it from the fire and suffer it to cool; strain it through a strong piece of linen, wringing it through the cloth into a clean glazed vessel, and keep it well covered for use." 

Mrs. Merrifield includes the following recipes from a ms. in the library of S. Marco in Venice, dating from the first half of the 16th c.

"Linseed oil is thus purified:- Boil it over the fire with water for three or four hours, then let it settle and separate it from the water." (Other recipes add salt to the water).

399. Item, a varnish which spreads like oil, dries quickly, and is very lustrous and beautiful, appearing like a glass mirror, and which is admirable for adhering firmly and for varnishing lutes and similar things.- Take one pound of linseed oil, boil it in the proper manner in a clean glazed pipkin, add to it half a pound of well pulverized clear and fine Greek pitch, and stir and incorporate the whole over a slow fire; then add half a pound of powdered mastic, and the moment you have done so, withdraw the pipkin gradually from the fire, because it swells up, and incorporate the ingredients thoroughly; then replace the pipkin on the fire, and keep it there until everything is well dissolved and mixed, when some burnt and powdered roche alum (allume di roccha) of the size of a nut should be added and mixed until that also is entirely dissolved and incorporated. Then take the varnish off the fire and strain it through an old linen cloth. Your varnish is then made, and it will be found to be beautiful varnish for wood, iron, paper, leather, and all kinds of painting and works, and for withstanding water. When you find it too viscous, dilute it with linseed oil in the proper manner.

Exactly these proportions are given in another recipe from the Mount Athos ms.

400. Item, a most excellent varnish of mastic for lutes, leather, panels, cloths, wood, and pasteboard.- Take 3 oz of strained and clear linseed oil and boil it. Then take 1 oz of mastic pounded and ground and add it gradually to the oil, mixing it in such a manner that it may be entirely dissolved and incorporated with the oil, and that it be properly evaporated ( sfumato?) and made into a varnish (as above) then put in a little pulverized roche alum at discretion, but sufficient to affect all the varnish; keep it over the fire until it is entirely dissolved and incorporated with the varnish and evaporated, after which you may take it off the fire, and strain it through an old and good linen cloth, when it will be finished. But observe that everything should be done over a charcoal fire and with great care.

402. Item, a most excellent clear and drying varnish proper for colours, both in oil painting and other kinds of painting.- Take 2oz. clear and good nut oil, 1oz. clear and good Greek pitch, and 1oz. clear
and good mastic; grind the pitch and the mastic (separately) to a
very fine powder, and place the oil in a clean glazed pipkin over a
charcoal fire, and let it boil gently until it is done sufficiently,
that is, until one third has evaporated; then put in the powdered
pitch a little at a time, mixing and incorporating it well; after-
wards throw in the mastic in the same manner, and when it is dis-
solved, take the varnish off the fire and strain it through a fine
and old linen cloth. And if you wish it to be still clearer, prepare
the mastic with tepid water in the following manner:—Take the largest
and clearest tears of mastic that you can find, and soak them in tepid
water, so that they may become tender; then select the best pieces,
dry them and pound them. You may also try the effect of adding a
little burnt and pulverized roche alum when the other ingredients
are dissolved, so that the whole may virtually be seasoned with it,
straining it afterwards. This is done in order to purify it better.

405. Item, an excellent common varnish, good for varnishing whatever
you please.—Take 2 oz. of clear and good linseed oil, and one oz. of
good and clear Greek pitch, but 2 oz. of the latter also will make the
varnish thicker and give it more body; boil the oil over a slow fire,
and then put in the pounded pitch a little at a time, that it may
incorporate well; and add a little roche alum previously burnt and
pounded, and when it is incorporated and boiled sufficiently, that is,
when you try a little of it in your fingers and find that it is done,
strain it and keep it. When it is used it will be beautiful and good;
if it is too tenacious you will dilute it with a little oil. And if
you wish it commoner so as to sell it at a larger profit, take 10 oz.
oil to one of pitch; and if you use black pitch it will be good for
pommels of swords, spurs and similar things.

Pulverized brick also is suggested for clarifying the varnish. Hurst
(op. cit.) states that all varnishes will improve with keeping and
suggests 6—24 months.

Heron-Allen quotes Fioraventi (Jologna, 1564)—"the oil should be
boiled until it scorches a feather dipped into it." (about 300°C.)

Cennini (11) writing of varnishing a painting on a wooden panel—
"When you have warmed the panel in the sun, and the varnish too, lay
the panel out level, and spread this varnish (vernice liquida)
thinly and thoroughly all over it with your hand. — If you do not
want to work with your hand, take a little piece of nice soft sponge
dipped in this varnish; and by rolling it over the ancona with your
hand, varnish methodically; and take away and add as proves necessary.
If you want to have the varnish dry without sun, cook it thoroughly
in the first place; for the panel will be very well off not to be
strained by the sun too severely."

Notes
   Varnishes. William Fulton. Journal of the Violin Society of
   America, Fall, 1976.
   Eastlake. London 1847. republished by Dover in 1960 under the
   title, Methods and Materials of the Great Schools and Masters.
3. Ancient Practice of Painting. Original Treatises, dating from
   the 12th to 18th centuries on the Arts of Painting, etc.,
   Mrs. Mary Philadelphia Herrifield. London 1885. I have not been
   able to find a more recent edition although I understood at one
time that it too was to be republished by Dover. The Library
   service obtained it for me after some months— that copy came from
   Glasgow University. It is on the reading list for the Courtauld
   Institute.
4. Violin-making as it was, and is. Ed. Seron-Allan. Yard Lock, London, 1895 and subsequently.

5. The Artist's Handbook. Ralph Mayer. Faber and Faber 1951. This book also contains useful information on egg/oil emulsions, pigments in different vehicles, etc.

7. Eastlake, op. cit.


10. Eastlake, op. cit.


Additional Bibliography:


Vasari on technique. Dover 1960. Hardly relevant but interesting contemporary background by Giorgio Vasari mainly concerned with sculpture and architecture.


The Practice of Tempera Painting. D.V. Thompson. repub. Dover 1962. As above, but a practical manual, O.I.Y. gesso, gilding, etc.

Experimental procedures:

These were by no means as simple as I had expected, partly due to ignorance on my part perhaps, partly by using in some cases rather small quantities in crude equipment, and also perhaps to a lack of information in the recipes.

The equipment used consisted of an electric ring (no thermostat) an enamel saucepan, 360°C thermometer (to check the feathers), a knife (for chipping out resin and testing stringing). Also available were a bucket of cold water for rapid cooling if necessary, a blanket and saucepan cover for smothering flames and half an unfinished pair of nakers to see if copper affected the colour of the pegola—it did not do so obviously. All the experiments were carried out out-of-doors to reduce the fire risk.

I used artist’s linseed oil (although stand oil would have cut down the cooking time) which I had previously tested by heating to about 350°C (if impure it will "break", making a brown, insoluble cloud in the oil). Sandarac and mastic resins were begged, gum thus (dry, solid) was "borrowed" locally from Corsican Pine woods. Alum was bought from Boots, mine was white, the best is supposed to be pale pink.

All the quantities used were calculated on the basis of 2oz. of linseed oil.

I attempted both the varnishes where lutes are specifically mentioned, also the earlier vernice liquida (sandalac) and the vernice comune.
1. I had most difficulty with the sandarac varnish. Unless the resin is melted beforehand ("run") it will not dissolve in the oil. Hence the two vessels in the formula which echo commercial equipment as described by Hurst. To follow the recipe it is essential to have two sources of heat as subsequent heating will not persuade the resin to dissolve if it does not do so when first mixed with the oil. This was the only time I actually set fire to a mixture. I achieved some success with a method implied in some of the formulae and mentioned by Hurst, by first melting the resin until it fused (it went from a whitish-yellow, via some frothing, to a dark red-brown), powdering it when cold and adding it to the boiling oil. Most of it dissolved using this method, although there was still a lot of gelatinous residue left compared with the solutions formed from the other two resins. I heated the mixture to about 310°C until I obtained stringing after about 25 mins. I have the impression that I might have obtained a larger percentage of yield if I had used larger quantities and slower heating at perhaps a lower temperature.

2. I had no difficulty preparing the pegola or pece greca. The depth of colour could be varied by the temperature to which it was raised. The frothing is caused by an exothermic reaction at about 125°C which results in the resin continuing to heat itself even after the heat source has been removed. Fulton also warns of this when preparing his resin from turpentine, but provided you are ready to remove and to cool the vessel there should be no danger. Both sandarac and mastic behave in the same way, as I believe do most if not all resins. When cooling the resin by dropping it into water there is some splashing and it is not easily removed from a plastic bucket. A large metal saucepan is better.

3. The Greek pitch/mastic recipe worked as described in the ms. The alum had a clearing action - specks and impurities seemed to be attracted by it - and probably also acts as a drier. I used a temperature of 305°C and cooked for 25 minutes.

4. The mastic alone recipe also behaved as expected, and reached the stringing stage after 30 mins. at 305°C.

5. The common varnish. I used 2 oz. of pece greca to 2 of oil, and the varnish seems very good. This is the recipe which is closest to Fulton's because it starts from the same materials. He however obtains his resin by oxidising turpentine, whilst the ms. recipes seem to imply that it is the residue left after the turpentine has been driven off that should be used.

Description of the varnishes obtained.

Drying was effected by exposure to rather dull outdoor light and to ultra-violet over-night (a single tube at about 18" ). The sandarac varnish dried in about 24 – 36 hours, mastic in about 6 – 8 hours and both of the varnishes containing the pece greca in 1 – 2 hours.

The paleness of the colours obtained came as a surprise. I had expected the sandarac especially to be quite dark. Although a strong red in the bottle against the light it is a warm but quite pale yellow at coating thicknesses. The mastic is even paler, certainly quite acceptable as a picture varnish, although I have subsequently achieved a pale orange by melting the mastic resin and over(?)-cooking it beforehand. This seems a possibly worthwhile area for further experiment. The colour of the other two varnishes depended on the heating of the pece greca. Dark but rather cool browns are easily obtained and the dark colours dried even faster - down to about 15 mins. in bright sunlight.
I tried applying all the varnishes with the fingers. It was difficult but possible in most cases. It could be made easier by cooking the varnish until it only just reached straining, although this lengthened the drying time. Mixing with a little extra linseed oil had the same effect. It was easier with those varnishes where I repeated the recipe using stand oil instead of linseed; the thickening of stand oil was at one time achieved by letting the oil stand in a sunny place for a year or more and many of the recipes recommend that the oil should be as old as possible. Turpentine seems to have been used little if at all as a diluent at this period, presumably it would have been expensive because distilled, even if its properties were known. I found that all the varnishes would mix with turps although the sandarac was the least successful and retained a somewhat jelly-like quality.

How dark should an instrument varnish be? It is possible to make an almost black varnish by adding iron oxide to the pine resin when it is cooked. However, of the three reproductions that I have immediately to hand, by Gentileschi, Cossa and Caravaggio, only the Caravaggio seems to depict a dark lute and as even here the sound-board seems to be as dark as the back, it suggests that an old lute is being depicted. A "badly" prepared picture varnish will darken badly in thirty years. If anyone has looked through a large sample of paintings comparing the colours of instruments with other objects and particularly flesh in the same picture, the results would be valuable. It may well be that particular colours were preferred at particular periods and in particular places, and this may give clues as to the resins used.

It is frustrating not to be able to immediately recommend a recipe as a successful instrument varnish. However, these are recipes which were at least close to actual practice, and bearing as some of them do, a strong similarity to Fulton's recipe and to the experiments of R.I. and others, 12 months ageing may make an acceptable varnish. I would be grateful to hear of any results from anyone using these or similar formulae.

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CRUMHOURS - a letter from John Hanchet to Jeremy Montagu

Dear Jeremy,

It's strange how ideas float around for years and then all of a sudden are seized upon by different people in different places at the same time. This time it's "Crumhorns bored by nature" or "Grow your own"!

There is a maker near Dusseldorf (Herr Ertel) who has been making very successful cornetto contoured cornamuse out of Elder for years. Encouraged by this, and by the thought that the Brussels crumhorns could well be made of this material, I went searching for a piece of elder to make a copy of one of the Brussels instruments. The task is made difficult by the fact that nature is not at all keen to reveal pieces of elder exactly like the one that made the Brussels crumhorn No.611 in c.1580? In fact, the piece eventually selected was one sent me in a bundle by post from a Dutch friend. (Have you ever seen an astonished German postman carrying what looked like a prop for a production of Macbeth?).

However, it is our Dutch friends in BouwersKontakt, headed by Toon Moonen, who have produced the best exposé of the pith-bored crumhorn and I hope that a translation will appear in FoMRHIQ in due course. I have had only a quick verbal translation while at a summer course this year, but from this it would seem that T. Moonen has sorted out the theory while I have gone...
more directly to the practice and produced an instrument, as I was able to use existing jigs and bending techniques etc with which I have been making crumhorns for years.

In view of this I should like to make a few general comments on the Elder wood crumhorn theory.

1) I would go along with the idea of elder wood being authentic. The result, after acid staining and allowance for age, is very like the originals and it bends about as easily as maple. Of course, I suppose everyone knows that the Brussels crumhorns, like the ones in Berlin, Nürnberg, Vienna, Prag and Meran etc, are all "in the round", i.e. Pith bored.

2) The pitch of the 'copy' with my normal crumhorn reeds on a rather long staple (I believe that the long windcap in there to be filled) was around C# but with the instrument a little flat at the top of the range. With the same reed on a shorter staple playing in D is quite possible and with a larger reed and a little bit of work with my diaphragm I am even able to play the instrument in C. In all cases the tone is full and round like the originals and I have the same experiences with pitch on the originals too. All the important chromatics are easily available, though, as on the originals, the cross-fingering is not perfect.

I hope that some of the army of North American research students buzzing around European museums with their little black electronic boxes will take note of this pitch variance and stop finding only what they expect to find (that all crumhorns, shawms etc are up at A-c.465). The point is that these instruments were never intended to be played at the same time as the Vienna recorders, or Bob Marvin's either.

3) There is just one huge problem which turns all this back again from an exciting practical reality to a matter of academic interest and that is that it is just about impossible to make a copy of a crumhorn in this material. Certainly the maker of the original had an easier job in that he was not trying to copy something which had been half constructed by nature and in order to make a number of instruments of a reasonable likeness he was able to select his material from vastly larger areas of woodland than society has left us with today.

It really is a problem to find pieces of elder that reveal the right size bores, enough thickness, enough straightness, with the nodes in the right places to allow bending and to be like the originals. When you think you have found a few you must X-ray each in two directions to find that there are straight outsiders with crooked bores and straight bores with unimpressive exteriors which you have probably rejected already. Worse than this there are often 'pockets' and other irregularities which mean that the instruments will be out of tune or have finger holes of all miscellaneous sizes to compensate.

In short, one must be selective with one's authenticity. You can have an authentic 'pith bored' instrument knowing that each one is a 'one off job' for the maker, and musically unpredictable until finished. Or you can have an instrument drilled and reamed in a conventional way without the help of nature and the maker can then know from the start that the bore is correct and barring disasters in the bending the musical result should also be assured. If someone ever finds a supply of unusually straight pieces of elder with uncommonly small pith diameter I hope they will get in touch, but they will probably find they have met some kind of a time machine and are once again living in the Renaissance; in which case there will be a few more secrets they can find out at the same time.
JM adds: As this was a letter to me, perhaps I may be allowed one point in reply and some comments. Has it occurred to you, John, that the C# you first obtained may prove two things: a) that you are right in the use of a long staple filling the windcap, and b) that Bob and his fellow North Americans are right in assuming the pitch was A-465? After all, C# at A-440 is C natural at A-465. QED.

This letter arose from conversation at the Early Musical Instrument Exhibition, where John had the crumhorn he describes on his stand. I was allowed to blow it (there may be photographs herewith) and I must say that I fell for it. The sound was very strong, robust and resonant, and reminded me of the tone of some of the relevant stops on the Frederiksborg organ. Personally I preferred it (and one can only be subjective in such matters) to the equivalent instrument of maple, and if it were ever possible to find a sufficient supply of elder I would think it worth the trouble of making crumhorns in that material.

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Jeremy Montagu

Review of: Conservation Sourcebook; for Conservators, Craftsmen and those who have Historic Objects in their care. Crafts Advisory Committee, unpaginated (paperback edn is 16mm thick), £4.25 paperback, £5.95 hardback. Publisher’s name now changed to Crafts Council. Copies presumably available from them (12 Waterloo Place, London SW1Y 4AU) if you can’t find it elsewhere.

The book is divided into 31 numbered sections, from 1 Museums to 31 List of Abbreviations, and each entry is numbered within each section (FoMRHI is 21.04, the fourth entry under Musical Instruments). The other musical entries are: British Institute of Organ Studies (and English Organ Archives); Early Music Centre; Fair Organ Preservation Society; Galpin Society; John Loosemore Centre for Organ and Early Music; Lute Society; Royal College of Organists; and that’s all. If this is a fair cross-section from which any conclusions can be drawn, it is apparent that the selection is very random with a number of obvious omissions (Musical Box Society; Viola da Gamba Society and many others) and some curious inclusions (one restorer, two teaching institutions of musical performance but not of conservation). Thus one rather feels God help anyone who is looking for sources of information on musical instrument conservation, for this book won’t.

On the other hand, there are a number of potentially useful sources under General and under various materials such as Wood, Metals and so on (and I do beg their pardon; one of my omissions, the Musical Box Society, is under Clocks/Automata). For example, the British non-ferrous Metals Technology Centre "is able to advise on all aspects of the use and conservation of metallic objects", and there are similar organisations under most materials.

Our entry has already led to the suggestion of an exchange with Conservation News (see Book News), as we already do with MICAT, and it may mean that we shall get enquiries about conservation in the future, which I will pass on as best I can. How much use the book will be to you, at the rather high price charged for it, will depend on the amount of conservation you do and the frequency with which it is useful to be able to put your hand on helpful addresses. The snag is the feeling, engendered by the Musical Instrument section, that the listing in any section may be neither comprehensive nor particularly helpful. I’d suggest having a look at a copy in a library before making up your mind. Incidentally, Scotland is relegated to a very short and summary section of its own at the back; there is at least one Welsh entry in the main body of the text, but a very strong English bias is discernible, with the main emphasis on London and vicinity.
Although the vielle or hurdy-gurdy is fairly uncommon in this country, its popularity has been gaining momentum and the need has been growing for a suitable English tutor for the instrument.

Doreen Kuskett has now published such a tutor giving a comprehensive background and method for playing the vielle. The book begins with a history of the instrument and continues to explain in detail how to set up the instrument for playing (a necessity for any beginner) and various other aspects of maintenance are covered in detail including the construction of a trompette bridge.

The method is outlined in 14 progressive lessons covering the fundamentals of playing and concentrating mainly on the right hand techniques for the trompette, since this is the distinctive characteristic of such an individual instrument.

Fingerings are explained, so too are techniques for style and interpretation of 18th century music together with a repertoire of original 18th century pieces for the vielle. Many varied pieces are written out in the book and are useful since a drone accompaniment tends to limit the playing to one key. Beyond this though where can music be obtained for the instrument? Many traditional folk melodies can be learnt from records and books like the "Carlton Memorial Tunebook", contain many suitable pieces (although some transposition is often necessary) and will be of interest to those concerned with English music. A bibliography includes many French tutors and methods and further music can be found here. The developing technique of playing on a single chanterelle is also covered but here of course the choice of music is not critical.

Overall, a useful and comprehensive book very much recommended for anyone who plays, or is learning to play, the vielle. Especially useful is the section on maintenance and setting up since a badly adjusted vielle really sounds appalling. Perhaps the only criticism is the high price, but with a limited demand this is to be expected.

Irran Tolley


Bryan sent me a copy of this record made by the consort he runs at this school, played by pupils at the school on instruments that they have made themselves, with sleeve notes by one of the pupils, Janet Allison. When I said I'd review it here, he demurred slightly, saying that it seemed a bit outside the scope of FoMRHI. I decided to review it all the same because it is a superb example of just what can be done. The playing is not perfect, but it's full of life and vigour, and I've heard worse performances in con-
cert halls and on records from professional ensembles. There is rather too much in and out of different percussion instruments for the taste of some purists, but other groups do this too, and for a first record which is designed to show off the ensemble one can't complain. I just wish there were more school groups like this, for this is where the early music of the next generation is — in school today, playing, listening, making instruments tomorrow. These are the FoMRHI members, the Early Music readers, the performers of the next generation, and if there were more people like Bryan getting them off to a start like this, there would be fewer of us wondering what's going to happen to early music in the future. I take my hat off to him, and to Janet Allison, Jane Burkinshaw, Sally Crowson, Angela Makey and Suzanne Roscow, and above all to their Headmaster, Mr. Drake, who had the imagination to allow it to happen and to go on happening (we had a member at one time who told me that he was dropping his membership because he had been doing the same sort of thing till his headmaster said "Right, we've done early music now; what shall we do next?" and shut the whole thing down).

The pieces on the record are: Josquin, Qui Belles Amours A; Conon de Bèthune, Ah! Amours; Anon, Bransle de Chevaux, Bacche-Bene Venies, Ungarescia. The instruments: recorders, crumhorn, hurdy-gurdies, organistrum, rebec, tromba marina, string drum, makers, tabor, rommelpot, triangle, cymbal.

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Will Jansen, The Bassoon. Two more fascicles have arrived, Part II of the plates, which completes them, and PartIII of the text. The plates require little description; there is a large number of portraits of bassoonists, some formal, some gossiping, some playing alone or in sections; a number of fingering charts, a few more technical drawings, and a lot of bassoons.

The text fascicle consists of the next chunk of Biography of Makers, starting with Doleisch ("specimens known: no bassoons") and going to Stowasser, Janos. Such a fascicle is very difficult to review. Certainly one can say, with pleasure, that there seem to be far fewer misprints than in earlier fascicles, but judgement of the text is not easy; if Mr. Jansen differs from Mr. Langwill, which is right? Only someone who has checked the documents in the relevant town registers and museums can say. What one can say is that there are some very odd entries here; a considerable number of makers have the somewhat curious note after them that we have already observed with Doleisch. Alright, maybe they did make bassoons, but the fact that they were woodwind makers does not necessarily mean that they were bassoon makers. And certainly an entry for Reuben Greene, the English collector, at one time of all instruments (he found a previously unknown 4-key Milhouse bassoon) but now of banjos as "Woodwind maker of unknown nationality and no life data are procurable" makes one suspicious of other entries, as does "Maunders, C.R.F. Unknown woodwind maker, probably English. No life data available" when he appeared in every List of Members of the Galpin Society I produced (so does Will Jansen) as well as our own Members List — perhaps he should drop Jansen a line. But the entry for the Stanesbys makes one wonder whether he reads the Galpin Journal when he gets it; Eric Halfpenny's articles in GSJ 12 and 13 contain much of the information Jansen claims to be lacking. The fascicle is divided into chapters and the chapters seem to have no particular relationship either to the alphabet or to the number of pages they contain or to folded printer's sheets; they seem purely random.
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BULLETIN 17 SUPPLEMENT; LAST-MINUTE ADDITION

Martyn Hodgson asks: "Does anyone know of a source of sheet glue? This is an animal (or actually more accurately probably fish)glue which comes in thin (about 1/8" thick) sheets and is of a golden brown colour and is quite transparent. I used to get it from Sydney Evans, but they only supply 'hide' glue now (this glue looks like brown sugar). The glue I'm after smells very strong when melted (very fishy; hence my supposition of a fish base) and is quite str strongest 'natural' glue I know. If anyone knows of a source I would be very grateful."