

# FELLOWSHIP OF MAKERS AND RESTORERS OF HISTORICAL INSTRUMENTS

BULLETIN AND COMMUNICATIONS. APRIL 1977

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with the upper surface of the body a film of some sort has to be applied between the probe and the body. Grease and oil are commonly used on metals, water has been used, so has wallpaper paste. For a musical instrument, almond oil might be acceptable, but it would be worth trying various devices - double sided adhesive tape - cork or rubber sheet if oil were unacceptable.



I hope that this type-face doesn't upset you too much. My publishers are producing a contract for three more books, so I thought that I would hire an electric machine for a month to see if I'd like to buy one, and they didn't have a machine with my normal face in for hire. Also this has no accents, so the List of Members is on my own machine, weak letters and all.

LIST OF MEMBERS: The 1977 list herewith. Unlike one of our fellow organisations, which hasn't produced a list for eight years, I am convinced that a small, specialist subject like ours demands such a list; it is essential to be in touch with one's colleagues. Every member of FOMHI should be in the main alphabetical list (any that come in between compiling it and posting this off will be at the end of this Bulletin - there are two so far). Every member, I hope, is listed in the Geographical Index - use this when you are travelling and use it to be in touch with members in your own locality. Not all members are in the Organological Index because not all of you have told me where your interest lies; if you're not in it, and you want to be, let me know between now and mid-June and I'll add you in the next issue. Also if I've left anyone out or made any mistakes, I apologise humbly, but do please let me know as soon as possible.

SUBSCRIPTION RENEWALS: I was obviously wrong last time, just putting the notice for this in the Bulletin; far too many people didn't see it (how many of you do read this Bulletin, I wonder?) and it has cost us 12 people's subscriptions to print and post a chase-up letter. Next year it will be a separate sheet that you won't miss.

FELLOWS: There are two new Fellows since last time: Joachim Braun of Jerusalem (violinist and lecturer/historian of history of instruments, especially of Russia and the Baltic States) and Bob Marvin of Woburn, Canada (flute & recorder maker). There was also another elected who has not yet re-subscribed for this year and so isn't listed as yet - one cannot be a Fellow without being a member. There are one or two others from last year who are not on this year's list, but I hope that they will reappear in due course.

LOST MEMBERS: Bryan Tolley has been found - new address in the List of Members herewith (several other new addresses, too - check it through before writing to people). Two others had their last issue returned to me marked 'Gone away': B.I. Stafford (from Greenfield, Olcham) and Brian Butler (from Yinner South, Victoria, Australia) - can anyone give me addresses for them? And please tell me when you move.

FOREIGN LANGUAGE EDITIONS: I have heard nothing at all from Russia since our last issue; I must write and ask them whether they are going to translate and republish. East Germany were also interested (the musical instrument museum in Leipzig) but there are various problems, not least the labour of translation - discussions are continuing and they are receiving the Bull/Comms. The Fellows have all agreed that this is a good idea and that we ought to make it possible for people in countries with currency-export restrictions to receive our material, and two Fellows have contributed financially to help in this; any member can of course pay a subscription for anyone who can't pay for him- or herself.

EARLY MUSICAL INSTRUMENT EXHIBITION: I have booked a stand at this Exhibition (it was called, if I remember rightly, the Early Music Fair two years and four years ago) which will be at the New Horticultural Hall, Westminster (not at the RCM this time) on September 15th, 16th & 17th.



This is chiefly to advertise the lectures that I give in schools, music societies and so on (adv: Musical Instruments of the World, illustrated with 150 instruments and lasting 1½ hours, and How Musical Instruments Began, illustrated with 50 instruments and lasting half an hour, with variants in between, and others) and the exhibition that I can present (some of you may have seen the one in Sheffield ten years ago, or have the Catalogue, and also the one at Durham four or five years ago), and also to boost my books. At the same time, though, it will give FOMRI a free stand at the Exhibition, and I hope that all of you whom I've not met, as well as those whom I have, will call round and also bring any colleagues whom you think would like to join us.

CONFERENCE on THE FUTURE of EARLY MUSIC in BRITAIN: This Conference at the Royal Festival Hall in May that I mentioned in the last Bulletin, is apparently to be by invitation only (which haven't gone out yet, though they should have done by the time you get this). I haven't had any comments from any of you about the subject that I've been asked to talk on: a central (or diffused) lending 'library' (organoteque?) of instruments for students and others. There is still just time if you're quick to make any comments on whether this a good or bad idea and any ideas on how it should be implemented if you think it's good.

THE EXPORT OF INSTRUMENTS: In answer to a query in the last Bulletin, Richard Wood of the Early Music Shop, who sends instruments of all sorts to all parts of the world, has provided a very useful guide which you will find in this issue.

COURSES: Walter Sallager has sent me the list of this year's courses at Schloss Breitenach in Austria: 13-17 July for Wind Instrument making and for Reed and Staple making, also for Mediaeval (I wondered if this machine would produce a diphthong) and Renaissance music and dance; 3-17 July for Wind Chamber Music. He and John Hanchet are among the tutors and are both FOMRI Fellows, and other members are also involved. Enquiries to him.

The Germanisches Nationalmuseum in Nuremberg has initiated a course for restorers under the direction of J.H. van der Meer and Friesemann Hellwig and also the Museum's chief restorer. It is a two or three year course and students must already be trained instrument makers and be to some extent at least musicians. No fee is charged by the museum but students (sorry about these recurrent gaps) have to pay their own living expenses in Nuremberg. If you're interested, write to Dr. van der Meer at the museum (D-6500 Nürnberg, Kartäusergasse 1, West Germany).

The Early Music Centre, which was a FOMRI member last year, has sent me a list of courses offered, most of which are now out-of-date, except for a one year full-time course on lute playing starting in September. I presume that they are still running all their classes in playing most sorts of early instruments. If you're interested, their address is 62 Princedale Road, London W11 4NL.

BOUQUERS-KONTAKT: Their latest Bulletin has arrived. It includes a list of their members, and if anyone is travelling in the Netherlands or Belgium it could be worth having - Djilda Abbott can make copies (12 pp, which at normal xerox prices, with postages, could be about fl.05). Also included is a note on crumhorn construction (further to the article in October 76 Early Music) by Toon Moonen, a list of courses on instrument making, an article on string formulae for instrument making, also by Toon Moonen, an article on humidity control of wood by Rik van Pelt, an article on the restoration of a descant recorder by Toon Moonen, with drawings of a number of the tools and gadgets made and used, an article on the restoration of a 17th century Italian virginals by Gerrit van der Veer with photographs. All this can be seen at NRI, who house it.



Copies are available from Bouwers-Kontak and further information from the authors' names, all of whom are in our List of Members; Rik von Felt has given blanket permission for any articles of his to be reprinted, so that one is available from Djinda (2 pages). It's in Dutch, of course.

CINCINNATI LETTER: Both NRI and I have copies of this. The 1975/76 issue included a list of the drawings available from the Smithsonian Institution in Washington and of their publications; also an interesting revision of some parts of the Hornbostel-Sachs Classification System by Dieter Kriesberg; also an article on and an example of the projected CINCINNATI Catalogue card, which, if adopted, would presumably be used by all musical instrument museums; and a lengthy annotated Technical Bibliography on the Care of Musical Instruments, compiled by Friedemann Hellwig, which I have been meaning to write to him and ask if we may reprint.

BOOK CLUB: A new feature which I thought might be worth introducing is a mini-Communication on books which I (in this issue as it's a new idea) and any other members who trouble to send material in have recently seen. Not to be confused with reviews, which we can only print if the publishers send us the book and invite us to review it (chiefly because a) that is the English custom and b) we are then not liable to be sued for libel unless we go beyond the range of customary vituperation). So if you have recently read or bought a book which you think would interest your colleagues and which you think they may not know, write a short note about it and let me have it. Books new or reprint or just ones that you have come across and found useful.

SEWING MACHINE: Further to Comm.22 & 23 (Bull/Comm 4) you are warned that Sewing Machines may be toxic (see Studies in Conservation 17 (1972), p.135 and 18 (1974), pp.133-5 - I have copies). Evidence is somewhat uncertain, BUT be very careful not to inhale it; clean all glassware very carefully after using it; NEVER heat it - it may explode. It is also suggested that you should be careful not to get it on your skin - for safety use rubber or polythene gloves. It is not yet certain whether it can be harmful if absorbed through the skin (there is some evidence that it may be carcinogenic; there is other evidence that it isn't) but it's better to be safe than sorry. I am very glad that this has been pointed out - do please always tell us when you spot anything dangerous.

FELLING TREES: Further to Comm.34 in the last issue, Walter Sallogar emphasizes that one should also pick the right time (see Vitruvius, he says). The tradition that one should only fell trees in the new moon after the winter solstice is still strong in the forest areas of his part of Austria, and it is precisely this sort of folk-knowledge that science is so often sniffy about and then has to admit is right. So, wait till mid-January 78 before you go out tree-felling.

GOOSE: Richard Maunder says, further to Bull.4, that anyone who pays 18p a pair for turkey quills needs his head examined; he goes to a local farm about December 20th each year and helps himself to hundreds (with permission) from an enormous pile in the yard. He says the quality is excellent and that he hangs them to dry for several months before use, though he doesn't know whether this is really necessary. So, look for a farm (or, I suppose, if there isn't one near you, ask him to pick up a hundred for you this year).

INTERESTING: Further to Comm.21 (Bull/comm 4), Richard Maunder points out that the answer to my problem regarding the position of the 6th in just intonation is that if it is to be a major third above the sub-dominant it must be 884 cents (495+389) and if it is to be a fifth above the supertonic it must be 926 (702+224); hence both may be right in different contexts and hence also the need for temperament since you can't have both. He suggests further that the need for temperament arose both for this reason and for



the sake of decent thirds; he stresses that it was the wish for good thirds that made near-tone temperament necessary even for music that stays strictly within the diatonic scale. This was a point that Bob Marvin stressed also during the FERRHI Seminar.

FERRHI SEMINAR: Which reminds me that I should have apologised earlier for the fact that the notice for this was on an extra piece of paper. Bob stayed here for a couple of nights on his way through to Europe and suggested the idea over the dinner table. I drafted a note about it and telephoned it up to Djilda and as the Bulletin was already with the printer, it had to be a separate note. It was a very interesting afternoon and evening and I hope by no means the last. Suggestions for further occasions will be welcomed, and I can't see anything to stop any of you organising other seminars in your own areas.

"EXACT COPIES": Further to Comm.28 (Bull/Comm.4, p.33), Richard Maunder says: "Point (C) seems to me to raise many important questions. It is clear that many degrees of 'exactness' are current, and while I accept that a perfect 'exact copy' is impossible, I think it is also an insult to the (regrettably few) makers who try very hard to make copies that are as exact as humanly possible to suggest that they use a phrase such as 'modelled after....' (horribly reminiscent of assembly-line harpsichords). In general, I think that standards of accuracy in 'copies', and even in published data, are appallingly low: for example, even in such a respected book as Hubbard's, the detailed drawings of the Hitchcock - the only one I've checked - contain many mistakes, and he himself admits that the soundboard barring details of the Haas were based on pure imagination. Vague phrases are not good enough (incidentally, what does 'based on' in [some] advertisements mean?). Could not publishers of data, and makers, especially of wind instruments, be encouraged to specify their standards of accuracy? A useful start, you report in Bull.5, p.8, has been made by Noonan who specifies an accuracy of  $\pm 0.1$  mm. (though personally I think this is not really good enough for a small woodwind bore, which can quite well be measured to  $\pm 0.001$ : remember that if one's reamers are made to the same accuracy as one's original measurements, the inaccuracy in the final 'copy' could be up to twice as much). Further comments, as Eph and Djilda said initially, will be welcomed.

REAMERS: Further to Bull.5, Richard comments again (and I wish that more of you sent as many comments - it makes for a long Bulletin but a valuable interchange of information): "What is wrong with an (accurately turned) hand reamer? The only function of the lathe in the operation of finishing a bore is to provide power (very little of which is needed anyway with a properly sharpened tool), since a well-designed hand reamer does not wander. Surely no-one in their senses could finish a lutesoundboard on a machine planer? So why be surprised at the poor finish of a 'machine turned' bore?" Again, further comments welcomed.

RESTRICTED MEMBERSHIP: Lars Holmgren writes: "I find the Fellowship most useful and there are many interesting articles by other members. It should however, I think, be more useful if the members (professional and amateurs) allowed in it were only those involved in a hand-crafted way, as the title of the fellowship suggests. Makers and restorers need an association, but museum-people dealing with instruments on another level already have theirs."

I fundamentally disagree with him (and have told him so). To start with, there is no question of 'allowing' anybody to belong (with the implicit 'forbidding'); we do have provision in the Rules for ejecting a member; I hope that it will never be necessary, but, as the Galpin Society once found many years ago, it is a necessary precaution to take. In fact, the Museum people either do not publish at all, or else publish in very esoteric and hard to obtain periodicals, apart from here and in GSD. Their own special-



last body, CIRCUM, puts out a bulletin once every year or two (chiefly for lack of enough contributions to make it worth issuing more frequently). We do need their expert help on restoration - they have facilities and equipment for experiment and work that most of us cannot afford either money or space for. And they need our knowledge about instruments and also some of our practical experience in restoration - look, for only one example, at their Handbook on restoration which, in many respects, is disastrous (I promised in our initial hand-out to write a commentary on it; every time I have thought of doing so I have been daunted by the fact that the book is so bad in so many places that any commentary would need to be as long as the book). Above all, it is not our business to forbid membership to anybody whenever it may be, if they think that they can derive some benefit from reading our Communications, nor is it our business to refuse Communications from any one if they can benefit us.

VARNISHING: David Miller says that "most turpentine-based varnishes, which should ideally be dried in sunlight, will dry more quickly under the light of ultra-violet fluorescent bulbs (the kind sold for encouraging growth in plants) than in the dark or under ordinary incandescent lighting. A dust-free cabinet can be constructed, with a bulb in each corner, and the pains of varnishing reduced considerably. The bulbs run fairly cool, but if the cabinet is small you may need to make some allowance for ventilation to prevent over-heating."

MUSIC & OTHER ARTS: Pauline Dürichen (I'd never buy a typewrite without accents - that should be an 'u' with two dots over it) writes that as well as making and playing instruments, she is a graduate student working for a higher degree in English literature and has always been interested in literary references to musical instruments as well as comments on performance practice and the philosophy of music; she already holds an MA in French literature, specialising in Mediaeval and Renaissance. She has used cross-references very successfully in seminars and papers and would be delighted to discuss literary/musical ideas with any fellow members who are interested. She goes on: "One thing that I have found is that it is much more satisfying and rewarding (for all concerned) to lecture to literature students about music as it relates to their field than it is to try and talk to music students about literature. The literature students seem much more aware of music (even those who profess to be 'un-musical') than the music students are of literature....I wonder why this is so? Has any one else been disturbed by this?"

I can say, for one, that I have found this profoundly disturbing. I have found the music degree students to whom I lecture at Goldsmith's quite extraordinarily ignorant about major painters and writers who either illustrate or describe musical scenes or who are simply a part of the culture of our civilisation. This affects all of us, for the musician who knows nothing of Pope or Dryden (Pauline's examples) nor of Rafael or Rembrandt (and) is not going to be interested in authenticity or worry whether he or she plays on a Connert or a Steinway. I have no ideas as to what we can do about it, save that we who are in this field must go on lecturing to music at students as well as literature students, and must go on plugging general culture in the hope that some of it sinks in.

TUNING STANDARDS: Mitsuo Yokoyama sent me the programme of a concert he gave, in which he specifies the pitch at which the instruments are tuned; some pieces were played at a' 440 and some at a' 415. Assuming that you know in advance which pitch standard you are going to use, this seems to me to be an idea worth copying.

OFFERS: Mitsuo Yokoyama played in that concert his own edition of Remy Redon's Suite in D minor (1676), which he has published with facsimile of the French 5-course guitar tablature and transcription into staff



notation; copies are available from him at £3, DM15, \$5, surface postage included.

Walter Sollager has a Three-in-One profiling machine for reeds for all double-reed instruments. Cost is 4,260 Austrian Schilling, plus transport. The 'Three-in-One' refers to three different sizes of cutting cylinder to allow for different sizes of reed.

Peter Ecker has a ready-reckoner for fret placing on instruments of varying string length (from 100 to 900 units in steps of 100 - normally mm, but it could equally be fractions of an inch), based on a divisor of 17.817 which gives an exact half at the 12th fret and very near two-thirds at the 19th. Copies available from him - he does not say what he charges, but it's a single sheet so I don't suppose it's much.

William Dobbenham says that he is always prepared to give advice on the techniques of drawing plans and measuring instruments and particularly on X-raying. He has prepared drawings of keyboards for the V&A and the RCM.

QUERIES: The first is a very embarrassed one from me: a member sent me a page of comment on Comm.10 (Grant O'Brien's paper); this has got separated from its covering letter in the file and I don't want it to appear anonymously, so I'm holding it till next time. Please will the author accept my apology and send me his name.

Fred Rubin asks, re Mace's Musick's Monument, what are air-wood and Rosemary air-wood?

John Haynes asks who can give him information on an Erat harp no.1571 - date of making, history, any other details? (NB Erat, not Erard).

From general discussion at Bob Marvin's seminar, does anyone know how accurate Bessaraboff's translation of the Brunswick foot is? Praetorius says that his scale is part of the Brunswick ell, and Bessaraboff then gives metric equivalents to a thousandth of a mm., but did he do this from a reliable standard or from the printed page; if it was the latter, paper shrinkage and so on is likely to have thrown him way out. Does anyone know how did it? Answers to me, please, for this concerns us all.

REQUEST: Dudley Hanson asks: "As a harpsichord builder I should be interested to read more information about those aspects of the instrument which are most difficult to observe. For example, string tensions and stress in relation to case construction, the weakness and strengths of the various ways in constructing the bent sides and liners, the barring of sound boards and the methods of fixing - ie animal glues v. synthetic. This type of information might be useful to those designing new instruments or building copies in which previous distorting stresses and other problems could be avoided."

In some respects it sounds as though he's asking for a complete manual, but it might be possible to restrict instruction to just those details; if anyone has the time to have a crack at it, it would probably benefit many members.

COMMUNICATIONS and RESPONSES: You don't really want the next issue in August, just when you're likely to be off on holiday, so I'd like to make the dead-line a week or so early and say that contributions for the next issue should be received by Monday, June 20th. Then, with any luck, you will receive it before the end of July.

If you are planning a museum tour anywhere during your holidays, bear in mind that you may be able to help colleagues by having a look at something for them, and that if you go to one of the less familiar museums you could write it up for us. Bengt Lonnqvist has sent me the Catalogue of the Sibelius Museum in Finland, and I hope he will write that one up for us.



Crafts Advisory Committee: I mentioned their Index in the last Bulletin and sent them a copy; they promised to send me a note on how the Index works but they've not done so yet - perhaps for the next issue. Meanwhile, it does seem as though they welcome applications to be on the Index. Their basic aim "is to help craftsmen maintain and improve their standards, sell their work, and become better known to the public".

On conservation, on which they have sent me a note, they make grants to workshops who will accept a trainee, to make up for loss of work and time in training (up to £1,000 for a year, with sometimes a further, smaller, grant for a second year - the trainee should be getting less in the way by then, so that's reasonable). They also produce grants for a fairly proficient conservator to work in another workshop and acquire additional skills. They also give grants to a conservator who is setting up his own workshop for the first time to cover 50% of the cost of essential equipment and up to £760 to help with running costs in the first year. And so on. Their address is: 12 Waterloo Place, London SW1Y 4AU. Don't all rush at once!

FINE WORKING: An American periodical which has suggested an exchange membership. I'm doubtful that it has much to offer us. William Cumpiano had an article in their Winter 76 issue (they also are a quarterly), which is why they got in touch with us (on guitar joinery). I'll send it up to Djilda and ask her to let me have it back by May 21st (see next item) so that any of you who see either of us can look at it and comment.

RESULTIMATELY: The last get-together was a very pleasant evening, so let's have another, a Saturday this time for a change, May 21st at 8.15 at the address below. Again, bring any wives/husbands etc. that you like and any prospective members (and some of your own beer or whatever). Light refreshments and gossip will be provided. Is anyone else organising similar meetings in other areas - see the Geographical Index of the List of Members for your neighbours.

FINALLY: Djilda, Eph and I are very grateful for the kind things that so many of you have said as you renewed your subscriptions. We're glad you're pleased with F&RHI - please don't hesitate to tell us of the things you don't like also. Some of them the majority may like, or they may be built-in unavoidably to a low-budget, spare-time production, but we're always happy to have suggestions for changes.

NEW & RESUBSCRIBING MEMBERS as at 4th April 1977

- Trevor Downing, 115 Grosvenor Road, Newcastle-upon-Tyne, NE2 2RN  
(woodwind; M).
- R. Laurence, 14 Ryon Close, Andover, Hampshire (lutes, rebec, cittern, bandora, orpharion; M).
- Jacques Leguy, "Aux deux Cornetti", 49 Avenue du Plessis 49, 92250 Châtenay-Malabry, France; tel: (1)350.44.99 (double-reeds, cornetts; M, P, U).
- Josef Marx, 201 West 86th Street, apt. 706, New York, N.Y. 10024, USA  
(all instrs, esp. oboe; C, P, U, publisher).

With only four, I leave you to put them into the two indices yourselves.

Jeremy Montagu  
7 Pickwick Road  
Dulwich Village  
London SE21 7JN.



## BULLETIN LATE SUPPLEMENT.

### CONSTRUCTION OF CRUMHORN

We have received a note from Anthony M. Moonen indicating his conclusions on the method used to make three Italian crumhorns in the Brussels Conservatoire Royal:

1. The bore is drilled in the blank.
2. The blank is then given slight bends.
3. The blank is turned to its final outside surface (except that it is left bigger at the bell end). Because of 2. the bore is now slightly bent, and is off-axis for most of its length.
4. The bell-end of the blank is carved to give a slight vee-shaped ridge on the side away from the bore. The ridge is going to be on the inside of the (main) bend.
5. The bell-end of the crumhorn is bent into the hook shape. The carved ridge serves to locate the instrument on a bending mould.

It is not apparent whether the bell inside is shaped before or after 5.

The object of 2. is for the bore to be straight under the finger-holes but running off-centre nearer the back of the instrument, so that the finger holes can be deeper, presumably to better achieve the desired nasal tone quality.

Anthony Moonen has been making the most attractive technical drawings of wind instruments that I've seen. His use of shading gives a much more vivid impression of the third dimension than is usual with technical drawings.

### GUILD OF AMERICAN LUTHIERS

We started an exchange with these people, who printed a plug for us: "The FoMRHI is a fledgling British organisation whose purpose runs about parallel to that of the Guild, although their scope is considerably more limited. So, early music fanatics, this just may be your Medieval Cream Pie." Coming from a bunch of people whose main preoccupation seems to be limited to plucked fretted instruments of the last 100 years I'd say that's cheek. Or maybe it just demonstrates that perception is coloured by preoccupation.

They produce a chatty Newsletter edited by Tim Olsen and a series of Data Sheets which tackle the serious business of putting instruments together. The address for joining the Guild is GAL, 8222 So. Park, Tacoma, WA98108, USA. Annual subscription was \$10 for 1976 for which you get the Newsletters and Data Sheets printed that year. Past numbers are advertised at 30 ¢ a page with reductions for a lot. But since this is last year's information and since postage abroad could cost extra, these rates are only for a rough guide.

In the Newsletters early instruments are used mainly for decoration and adverts. Of particular interest to FoMRHI in Vol 3 No 5 and 6 issue is an address to the GAL by Lawrence Libin, Associate Curator in Charge, Department of Musical Instruments, Metropolitan Museum of Art, New York "Museum Services for Luthiers" which is most pertinent to our own Coms 40 and ..... and we will seek to reproduce it in full next FoMRHI. Theron McClure writes on aspects of the English early music scene. Vol 4 no. 3 contains another plug for FoMRHI; they are doing us proud! Also some notes on books for beginner instrument-makers by Donna Curry



The real goodies are found in the Data Sheets, so I list them all with notes on those most relevant to us.

1. Soundhole Rosette Making - Traditional Spanish Style M.E. Huttig
2. Musical Hardwoods. David A Sturgill. A quick rundown on the kinds of factors to consider when deciding what woods to use. I would also go further and recommend consulting handbooks on wood properties to find a wood with similar properties to the traditional woods:-
  - Handbook of Hardwoods published by Her Majesty's Stationary Office,
  - Properties of Imported Tropical Woods U.S.D.A. Forest Service Research Paper FPL125 March 1970. U.S. Dept of Agriculture Forest Service,
  - Wood Handbook by Forest Products Laboratory Forest Service, U.S. Dept of Agriculture.
3. Finishes Re Bruné. A Chinese lacquer recipe from 1609 from "Classical Book of the Lute" by Chang Ta-imung. translation from R.M. van Gulik "The Love of the Chinese Lute". A little on oil varnishes. Rather more on French Polish and Polyurethane.
4. Calculating Fret Scales Robert Detrulis. How to do it on electronic calculators. Equal temperament only. No correction for the rise in pitch caused by stretching the string when you press it down to the fret.
5. Questionnaire Results Bob Petrulis. An opinion poll on supplies and a motley collection "Useful Reference Books".
6. Musical Woodcutting David Sturgill. Good advice, includes some on how to pick your wood.
7. Separating Glued Joints Nick Hayden. Glue for Inlays Tim Olsen, Spruce Patches Leo Bidne, Bridge Positioning Eric Henderson - all this for just 30 ¢!
8. Finishes II (or French Polish Part I) by R E Bruné.
9. Soundboards David Sturgill. The wood, not their construction.
10. Comment on Electronic Aiding of Stringed Instrument Sound. R W Burhans
11. Fret Spacing, Part 2. Poor man's version of no. 4; no electronic calculator required, but a good head for long multiplication sums.
12. French Polishing II. R.E. Bru e
13. Charlie Christian Pickup. Doc Kauffman
14. Steel String Guitar Head Repair, Tim Olsen.
15. Basic Guitar Electronics Robert A Petrulis
16. French Polishing III Conclusion R.E. Bruné
17. Strings for Ethnic Instruments Joseph Valentich. This explains how the author makes custom strings for ethnic instruments, it looks similar to the custom strings NRI makes for early instruments.
18. Tamburitzas Nick Hayden.
19. Instrument Wood Basics H.E.Huttig. A little history, a glossary of wood terminology, and notes on some guitar woods.
20. Resophonic Guitars Robert F Grear
21. 1902 Martin Anon. Photos of front and back of belly.
22. Inspection Mirror Tim Olsen. Gadget for lighting and looking into instruments with bigish soundholes.
23. A Fret Tool Hank Schreiber. for filing the ends of metal frets.
24. Hangers for Spraying Tim Olsen
25. Bending Irons (part I) Tim Olsen. Our FoMRHI Com ..64.. is by no means the last word on this subject. This Data Sheet describes some much



- much like ours, plus one with the element being a charcoal starter, and a very nice one consisting of an immersion heater potted in solid lead which has lot of heat capacity and you can make any shape you like.
26. Roller Hole Jig Derek Iveson (for modern guitar machines)
  27. Fret Spacing Device Tom Peterson. I suspect this is a copy of NRI Fret Chart (price 90p and you don't have the work of drawing it).
  28. Gibson Banjo Information Tom Morgan Much historical information but for the purpose of converting 1920's and 1930's banjos to 5-stringers - irresponsible mucking about with historical instruments!
  29. Pearl Inlay Method John Thierman Practical methods, no historical information.
  30. Neck Supporting Device Leo Bidne To hold a guitar neck still while you work on the frets. Will do for citterns, bandoras etc.
  31. Wood Drying Cabinet Dick Deneve. If your instruments will be used in dryer conditions than your workshop you will need a drying cabinet.
  32. H E Huttig Tool Sharpening Types of tool steel and uses. Types of edges. Types of grinding stones, their use and maintenance. Bibliography.
  33. Bending Irons Part II Larry Lundry and Bob Petrulis Make the iron from rolled-up copper sheet, any cross section you like. How to control the voltage on an electric heating element by wiring up some light bulbs with it.
  34. Bridge Plate Repair John Thierman
  35. Intro to PEG H E Huttig PEG is polyethylene glycol-1000 It diffuses into wood and gives it dimensional stability.
  36. A Harpsichord Primer: One Maker's View E O Witt, Reprinted from the Journal of the Audio Engineering Society Oct 75 vol 23. This paper runs through a lot of topics: history of harpsichords and strings, physics of string vibration, design and action of plectra, and very briefly soundboard construction. Much of what he says is very original and at variance with what others have written on these topics, but he does not present enough detail for the reader to assess the validity of his conclusions.
  37. The Ruck-Bruné Sanding Machine Revisited. Derek Iveson. The detailed and illustrated story of how Iveson, starting from a picture in Vol no 1 of GALN (which I haven't seen), made himself a fine-adjustable thickness-sander for \$150 plus a  $\frac{1}{2}$  HP motor.
  38. Small Bow for Psalteries and Dulcimers. A clever idea which looks easy to make. I don't know of any old bows like this.
  39. Supplement to Data Sheet 26.

#### FINE WOODWORKING: QUARTERLY

Jeremy mentions this quarterly on the last page of the Bulletin. There's not a lot in it that's relevant to FoMRHI aims. The article on guitar joinery is concerned with modern construction methods - I reckon that makes it worth just a quick mention here. The magazine contains a familiar mix of articles: designs for things I cannot imagine ever wanting to make, and descriptions of techniques that I can go and look up in the standard textbooks as and when I want to know them - all tastefully produced and as far as I can judge, competently written. However, a quick browse through was rewarded by a couple of interesting gadgets I haven't seen before. On this basis I think we should go ahead with exchange membership and give a summary of material relevant to FoMRHI in each issue. The address for correspondence is, The Taunton



Press, PO Box 355, Newtown, CT06470, USA.

The current issue, Winter 1976 vol 1 no. 5 includes, in addition to Ciampino's article:-

- Drying Wood: The Fundamental Considerations by R Bruce Hoadley,
- The Bowl Gouge: Using long and strong tools to turn the outside by Peter Child,
- Making Shaper Knives: Making cutters of almost any profile by Tommy Bargeron.

One interesting gadget which is advertised is called a Sand-O-Flex. It consists of a rotating wheel with flexible sanding fingers which can sand inside tricky curved shapes.

The other gadget is a bandsawing aid that anyone can make, described by M G Rekoff Jr. Every instrument maker must have had occasion to curse a bandsaw for drifting when rip-sawing a thick piece of wood, even if the wood is pressed against a fence. The work is guided against a tall vee-block clamped to the bandsaw table. The rounded point of the vee is located to one side of the blade at a distance equal to the thickness of wood to be sawn, and an imaginary line drawn from the point to the sawteeth should be at right angles to the blade. The vee helps guide the work while you concentrate on angling it so that the blade keeps to your cutting line. Reckoff makes furniture; I don't know if the method works well enough for lute fronts or viol backs. This reminds me of a method which John Duncalf in our workshop uses for cutting staves on the bandsaw: don't try to cut off each stave in turn, but cut the whole billet in half down the middle then keep doing this to each half until the staves are thin enough to plane down. He finds that two equal halves are balanced and there is less tendency for the blade to wander.

## SUPPLIES

Paul Kemner sends information: Lewis Luthier Supplies Ltd 3607 W Broadway, Vancouver V6R 2B8 Canada, have yew, shaded yew, flamed maple, - lute ribs, many instrument makers tools, etc. Woodcraft Supply Corp., 313 Montvale Ave, Woburn, Mass 01801, U.S.A. have many tools including shell awgers, peg shavers Japanese tools etc.

## FoMRHI SEMINAR NO. 2 AND GET TOGETHER

A seminar on Medieval Instruments will take place on the first weekend in June, at 18 Moorfield Road, West Didsbury, Manchester, M20 8UY. Everyone is welcome to come, and to contribute. Bring your instruments, pictures, etc. We have an epoptiascope, a slide projector and an overhead projector. The plan at present is to start the Seminar at 2.00 pm on Saturday 4th June, going through the afternoon with breaks for food etc, and to have a social get-together in the evening (see below). If enough people are contributing we can extend the Seminar, either by starting earlier or by continuing over to the Sunday. If you are thinking of coming, please contact me so that I can send you further details nearer the time. Let me know if you plan to contribute, and whether you would prefer the Saturday morning or the Sunday. Overnight accommodation can probably be arranged with friends.

The social get-together will be at 8.00 pm on Saturday 4th June, following on the afternoon Seminar. This is for all FoMRHI members, not just the Medieval Instruments enthusiasts, and bring wives/husbands etc. We will provide light refreshments and drinks, but bring some more if you like.



We felt, since there was room, we should reprint the following report so that our members need not keep loose sheets.

SEMINAR 0: MEDIEVAL STRINGED INSTRUMENTS

Peter Syrus

On Sunday 12th December several researchers into medieval stringed musical instruments met in Manchester for an informal exchange of notes, references and ideas. All came from the North of England, but it proved so stimulating that it was hopefully seen as the first of a series of wider-based day conferences on aspects of instrument technology and organology. This one concerned string instruments prior to the 16th century and the problems of terminology, reconstruction and playing styles of those known almost exclusively from pictorial representations as opposed to surviving examples.

Christopher Page and Lewis Jones jointly discussed their research primarily into the instruments portrayed in the magnificent 13th century Spanish miniatures of Alfonso el Sabio, the 'Cantigas de Santa Maria'. What became immediately obvious was the desirability of good colour reproductions of the forty or so miniatures depicting instrumentalists (of which half are playing cordophones). Colour can help more conclusively in establishing whether material over the resonator is of wood or vellum, the precise style of decoration, the coloration of bows (their greenish hue frequently suggests the use of young bamboo) and so on. Lewis Jones presented a convincing reproduction of one instrument from the miniatures, the first of a projected series, a two-string scaphoid fiddle supported on the knee (a more revealing description, or reference to its similarity to the modern Moroccan rebab, is dangerous, but this does highlight the fact that identification in any standardised form can only happen when pictures are more readily available. Christopher Page, working principally on literary references to instruments in England from Anglo-Saxon to the late medieval period, commented on the playing techniques suggested in the 'Cantigas'. As an example he noted that on the large pig's snout psaltery one hand could be detected plucking with fingertips a small number of strings of lower range (a drone motif ?) whilst a plectrum in the other hand etched what was presumably the melody. Page also cited examples of identical or related instruments from other pictorial sources, and spoke of the criteria whereby one could judge their comparative similarity or difference. He commented further on the interplay of Arabic and other influences in the design of early string instruments, and singled out his study of illustrations of the early English lyre, concluding that it often was played with the strings facing the player. This raises questions as to whether the decoration on the Sutton Hoo reconstruction is on the right side.

Ephraim Segerman raised two problems concerned with the reconstruction of medieval instruments, the first being that of size (instrument relative to performer). The scaling procedure outlined in Com 39 was discussed. The second problem was that of stringing. He wondered about the extent to which equal tension as prescribed by Mersenne and Leopold Mozart and implied by Mace (but violated on the violin since the 19th century and especially nowadays by German string makers) applied to earlier instruments. There then followed two practical demonstrations. One was of an angled sweeping bow stroke starting from one end of the string and moving along its length; this was seen not only as a possible but entirely feasible technique consistent with many early illustrations. The other showed the stopping of a bourdon string by the thumbnail, and the stopping of strings on the fingerboard with the thumb, again possible components of medieval fiddle technique suggested by the pictures.



Lawrence Wright presented a wide range of colour slides of extremely fine quality, but because of shortage of time could only briefly discuss his particular and present involvement with representations of the citole and gittern. From the beginning of this century the citole has been the subject of confused and confusing descriptions, mainly because unlike the lute or gittern it seems to have been in use in France only for the relatively short period between c. 1200 and 1350. Certain interesting characteristics are beginning to manifest themselves as a result of comparing the available iconographical evidence, such as the association of the classical citole with pointed 'shoulders' (derived from the yolk of the cithara) with an unusually large, often decorated, plectrum. A persistent problem, however, seems to be one of distinguishing between plucked vielles and citoles when the latter are not of classic shape (for considerably more information see L. Wright's article 'The Medieval Gittern and Citole: a case of mistaken identity', to be published in Vol. XXX (1977) of the Galpin Society Journal).

#### REPORT on FGRHI SEMINAR no.1

Jeremy Montagu

There was a good attendance at Bob Marvin's Recorder Seminar here on 5th March, despite the short notice, with more players than makers present. A number of different but interconnected topics were discussed, though there was less controversy and argument than might have been hoped for. Instruments of various makers were played and compared, with Bob's being in the majority.

The three main subjects were: Typology, the Range of Surviving Instruments, Tunings.

Typology: There are three types surviving in museums: inversely conical as far as the little finger holes and then expanding; wholly cylindrical; early baroque, an inverse cone to the foot, or almost to the foot. Bob produced examples of all these and of a fourth, a hypothetical reconstruction based on Ganassi's woodcuts, cylindrical but with expanding foot to help the high notes be in tune without making the 4th hole too big.

There was a considerable difference in tone quality between these four types, quite enough to show that there is no such thing as a "Renaissance Recorder".

Range of Models: There are very few surviving instruments and what there are show a very strong bias towards the large instruments, for which there is little other evidence. It was suggested that much of what does survive may have been made as collectors' pieces (Kunstkabinet), rather than as playing ensembles, although a number of the surviving instruments do show traces of use - whatever purpose they were made for, some of them were used. There appear to be only three surviving collections (possibly even fewer, since some now divided instruments may have a common origin) plus a few accidental survivals. It was agreed that this was not a valid statistical sample, so that what little we do know of renaissance recorders is based on atypical survivals.

Tunings: There is considerable evidence that Pythagorean tunings were used in the earlier periods, with the dissonant third that this implies. It was the desire for a consonant 3rd that led to just and later to mean-tone temperament. For example, Walter of Odington talks of making citones (3rds) smaller to be consonant; Franchinus Gaffurius speaks of tempering the citone; Salinas seems to advocate tempering a Pythagorean citone at cadences. The suggestion is that in this way the Pythagorean



gradually merged into the mean-tone, with a good deal of intermingling. Ech had a possible solution of playing Pythagorean semi-ditones and just ditones, which was difficult but possibly worth trying to master. Instruments that he had played in museums mostly had ditones (3rds) on the small side, with 5ths also rather small and 4ths a bit larger, possibly to help intonation of upper notes - for example, to play high a on a c instrument, the first 5th must be a bit small (c to g) if one is not to have to use extra fingers of the right hand.

The ensuing, preceding and intervening discussion covered a wide range of topics and it is to be hoped that this first FoMRHI seminar will be the first of many.

#### FoMRHI Book News

FoMRHI Com. 56

Jeremy Montagu

I have recently bought, or been sent for review elsewhere, four books that may interest members.

A.C.Baines, Brass Instruments, their History and Development, Faber, London, 1976, £12.50 (I presume there's also an American edition)(sent for review in TLS and EM). We all know what Tony Baines did for the woodwind, and he's done just as well for the brass; the information on the early history of valves is out-standing.

A.C.Baines, The Bate Collection of Historical Wind Instruments, Faculty of Music, University of Oxford, 1976 (available from A.C.Baines at the Music Faculty, £2.50 or £6.00 post free)(sent for review in GSJ). An excellent printed catalogue of the collections so generously given by Philip Bate and R.Morley Pegge's son and other collectors. Lengths are given for all instruments and diameters for each end of each joint for a number of the flutes, oboes, clarinets and bassoons.

Arthur H.Benade, Fundamentals of Musical Acoustics, Oxford University Press, 1976 (bought; if I remember rightly at about £12 - I don't know the American price). I don't know whether one could describe Benade better as the best musician among physicists or the best physicist among musicians, but he never forgets that musical instruments are for playing music on and, what is even more surprising, even a mathematical ignoramus like me can understand every word.

Alfred J.Hipkins, A Description & History of the Pianoforte and of the older keyboard stringed instruments, reprint of the 1929 edition, Detroit Information Coordinators, 1975 (with an introduction by the greatly lamented late Edwin Ripin). An extraordinary amount of information in just over 100 pages and, except on present locations (ownership changes in nearly 50 years) thoroughly reliable.

As I have said in Bulletin 7, I hope that other FoMRHI members will send in similar brief notes on books that they have acquired or found useful. But do remember that we cannot print unsolicited reviews - only very brief descriptions such as these.



# RENAISSANCE TRANSPOSING KEYBOARD INSTRUMENTS (II)

Nicolas Meeùs

In the first part of this study (FoMRHI Com. 45, in Bull./Com.6), I tried to show how transpositions to the 4th or 5th afforded satisfying solutions to most of the problems of pitch encountered by medieval and early-Renaissance organists. Transpositions to the 4th or 5th were the only ones performable on keyboards with no more than one chromatic key per octave, as sometimes was the case in the Middle Ages. Up to the 17th century, many keyboards had no more than one chromatic key in the low octave, when they had a short octave. Here too, no other transposition than to the 4th or 5th would have been performable if the music to be performed made use of the low octave. So long as the problem was restricted to accompanying singers in church at a convenient pitch, however, no other transposition was really needed.

Transpositions to the 4th or 5th were rather trivial in the solmization system, while all others were quite complex procedures involving the technicalities of *musica ficta*. The medieval Gamut ranged the b-flat among the 'diatonic' degrees. Therefore, any transposition involving the b-flat only was performable without 'chromatics'. Pieces without b-flat as written were transposable up a 4th or down a 5th within the Gamut. Several Gregorian melodies included a b-flat when untransposed: these, and the pieces based on them, were transposable up a 5th or down a 4th if they had no b-natural when untransposed, the effect of the transposition being here of removing the b-flat rather than adding it. In short, every diatonic melody had two 'natural' positions a 4th or a 5th apart in the Gamut — and on the keyboard, where the b-flat key at times was ranged among the lower keys. To take an anachronistic comparison: on such a keyboard, both c- and f-major are playable on the white keys.

We must now see how and to what extent the situation changed during the Renaissance, when the solmization system and the medieval Gamut lost much of their significance. Of course, I could not review here all Renaissance treatises, although many of them have something to say about transposition. Since the present study is primarily concerned with Ruckers instruments, it may suffice to examine the opinion of one of Ruckers' most famous contemporaries, Praetorius. As will appear soon, his conception is still based to a large extent on the medieval theory.



#### 4. Praetorius and the transposed modes

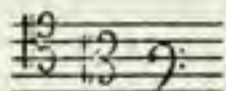
Chapter IX of the *Syntagma's* 3rd volume provides important information on the performance of transpositions. Here follows a commented translation of the most important passages of this chapter.

##### "Chapter IX.

##### Of the Transposition of Melodies.

##### How and to What Extent Some Chants must be Transposed in Transcription.

"Although every piece that is written in high clefs, i.e. in which the bass is written in the C-clef on the 2nd or 3rd line counting from the top or in the F-clef on the 3rd line, as this:



must be transposed when it is put into tablature or score for players of the organ, the lute and any other foundation instruments, as follows: if it is in bmol, down a 4th into durum; if it is in bdur, down a 5th into mollem, yet in some modes, e.g. Mixolydian, Aeolian and Hypoionian, when they are transposed down a 5th, the sound produced by the resulting low pitches is dull and poor. Hence it is much better, and the singing becomes much fresher and more spirited to listen to, when these modes are transposed down a 4th, from duro into durum"<sup>1</sup>.

The terms bmol and bdur, molle and durum, have been explained in part I of this communication (Bull./Com. 6, pp. 21-23). In short, they can be understood as follows: most melodies were written within at least two hexachords, the 'natural' and the 'soft' (or molle, including the b-flat or bmol) or the 'natural' and the 'hard' (or durum, including the b-natural or bdur). What Praetorius means is that pieces written in the 'natural-soft' group of hexachords, with a flat in the signature (but see below), must be transposed down a 4th into the 'hard-natural' group and that, inversely, pieces in the 'hard-natural' group must be transposed down a 5th into the 'natural-soft' one.

Thus, this first paragraph states that if a piece is notated at a high pitch-level it must be played a 4th or a 5th lower on polyphonic instruments. The reason why foundation instruments only are mentioned obviously is that the chapter deals with the writing out of transpositions in transcription. It is clear that melodic instruments also had to transpose, but they could do it *ex tempore* from their part. One may wonder why the piece had been written high if this did not correspond to the composer's intention. It cannot be that the high notation involved less accidentals, since the transposition down a 4th appears to have the effect of removing a flat from the signature. Neither can it be that the high notation involved less leger lines since two notations a 5th apart in pitch could always be put in the same position in the staff if the proper clefs are chosen. The only reasonable explanation is that the piece was in a given mode, or based on a modal cantus firmus, which it seemed better to notate untransposed.

Praetorius goes on stressing the difficulty of the transposition from duro into durum mentioned at the end of the first paragraph:

"This however is not only difficult and inconvenient for the organists, but also causes an unagreeable harmony at some places, namely when b-natural and f-sharp must be played together with the major 3rd d-sharp in between, which is somewhat too sharp and too high and therefore false"<sup>2</sup>.

<sup>1</sup> *Termini musici*, 80 f.; cf. A. Mendel, 'Pitch...', *MO* XXXIV (1948), 347 f.

<sup>2</sup> *Termini musici*, 81.



The problem referred to is that keyboard instruments in meantone temperament usually have an e-flat, too high to serve as the major 3rd above b. It is striking that if a d-sharp was needed after the transposition down a 4th, it must be that the piece included a g-sharp when untransposed. The difficulty of this transposition, as of any ficta transposition, was not merely that it implied playing black keys: even untransposed pieces included accidentals.

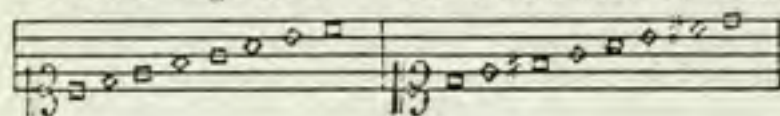
The matter is somewhat too complex to be fully discussed here, but it appears that a distinction must be made between 'contrapuntal' accidentals, which were not always included in the signature, and 'transpositional' ones. It must be remembered that the Renaissance musicians had rules determining where unwritten accidentals were needed: these rules were perhaps not fitted for discovering where 'transpositional' accidentals were needed. Another point is that Praetorius's expressions 'in bmol' and 'in bdur' cannot be understood as meaning that the pieces would either have a b-flat or no accidentals: here, a piece 'in bdur' had a g-sharp when untransposed. It may be that the cantus firmus had no accidental and so truly belonged to the natural-kind group of hexachords.

Praetorius explains how the d-sharp can be omitted, or replaced by a d-natural, or hidden in a shake. He stresses the usefulness of keyboards with split  $e_b/d\#$  keys and discusses the advisability of providing the organ with a device for transposition down a tone or a minor 3rd, less useful, he adds, in the case of stringed keyboard instruments where the retuning of  $e_b$  into  $d\#$  is practicable. Apparently, Praetorius implies that the transposition down a 4th could be replaced by one down a 3rd or even down a tone: he does not seem to have been much concerned with the exactness of the resulting pitch.

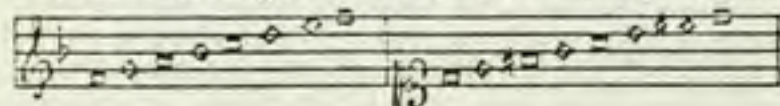
After a discussion of some cases where transpositions up or down a tone could be useful, Praetorius goes on:

"It is necessary to remember here that the Ionian mode, if it is too low and dull when untransposed, but too high and uneasy for the singers when transposed, can be played a tone higher if it is in the Natural and Regular System, or a 3rd lower if it is in the Transposed System, on d, as can be seen in the following examples:

"Tonicus regularis Per tonum minorem elevatus



"Tonicus transpositus Per tertiam depressus"<sup>3</sup>



It will become clearer below that the Regular and Transposed Systems correspond to the two keys in which a given mode could normally be written. In the example above, the Ionian mode in the Regular System is c-major, in the Transposed System it is f-major and the example merely shows how to make it d-major. Praetorius merely shows how the mode can be brought to a convenient pitch, starting from either of the two notations. But let us first shortly review the end of chapter IX.

<sup>3</sup> Termini musici, 82 f.



"However, it is not always necessary to transpose a chant to the 4th or 5th in the partition or in the general bass, but (it may suffice) to transcribe it as it has been found in the notation: indeed the transposition, especially to the 5th, is much easier to observe and to understand in the notes than in the German alphabetical tablature. One can easily imagine another clef at the beginning and direct oneself by it. If however someone is not used to this and does not find his way through it from the beginning, he can write the proper clef on a little piece of paper and paste it with wax on the lines, so that he has it under the eyes as he wants it to be. Similarly, I have inscribed two clefs at the outset of some Courantes in my Terpsichore, for the sake of the transpositions on the instruments"<sup>4</sup>.

That is: it may not be necessary to write out the transposition (but well to perform it) if the original is in staff notation. The case of Praetorius's own Courantes is particularly interesting in that it shows that the transpositions were not always needed: otherwise, it would have been useless to provide two clefs. It is clear, of course, that the need for a transposition depended on the pitch of the instrument. The chapter closes with examples of the clefs to be utilized for transpositions up or down a 5th; as Praetorius explains, transpositions up a 5th must be read an octave lower than written: they correspond to transpositions down a 4th.

#### 5. Praetorius's Regular and Transposed Systems

In 1547, Glareanus had extended the number of the modes from eight to twelve. The four new modes were authentic and plagal equivalents to the modern major and minor. These 'new' modes were perhaps not as new as some Renaissance or modern theorists may have thought. Indeed, in the Middle Ages, each ecclesiastical mode had known two forms, one with b-natural and the other with b-flat. What Glareanus did was merely to give a new status to two of the modes with b-flat: the former d-mode with b-flat became the new a-mode (Aeolian), corresponding to our minor, and the former f-mode with b-flat became the new c-mode (Ionian), corresponding to our major.

Praetorius gives a short description of the modes in chapter VI of the Termini musici, where he provides tables of the twelve modes, first in staff notation, then in score — that is, on a staff of twelve lines —, then in German organ tablature. Each mode appears first in the Regular, then in the Transposed System, the second being either a 4th higher or a 5th lower than the first. The Ionian mode, for instance, is first tabulated as a c-scale, then as an f-scale with b-flat. In this case, the purpose of the Transposed System is obvious: it presents the Ionian mode in its ancient ecclesiastical form.

In other cases, the purpose of the Transposed System is less clear since, at first sight, it is the Regular System that appears to correspond to the ancient form. The authentic e-mode, for instance, becomes the Phrygian Regular, of which the Transposed System is nothing else than a mere transposition. The table below will make the present discussion easier. The left column summarizes the information provided in chapter VI: it lists the names given by Praetorius to the twelve modes and describes the scale to which they correspond; the sign \* marks the modes which are written in high clefs. The right column establishes the correspondance with the medieval modes.

<sup>4</sup> Termini musici, 83 f.



<i>Dorius regularis</i> (d-scale with $b\frac{4}{2}$ , final d) <sup>5</sup>	Auth. d-mode with $b\frac{4}{2}$
* <i>Dorius transpositus</i> (g-scale with $b_b$ , final g)	Auth. g-mode with $b_b$
* <i>Hypodorius regularis</i> (a-scale with $b\frac{4}{2}$ , final d)	Plag. d-mode with $b\frac{4}{2}$
<i>Hypodorius transpositus</i> (d-scale with $b_b$ , final g)	Plag. g-mode with $b_b$
<i>Phrygius regularis</i> (e-scale with $b\frac{4}{2}$ , final e)	Auth. e-mode with $b\frac{4}{2}$
* <i>Phrygius transpositus</i> (a-scale with $b_b$ , final a)	—
* <i>Hypophrygius regularis</i> ( $b\frac{4}{2}$ -scale, final a)	Plag. e-mode with $b\frac{4}{2}$
<i>Hypophrygius transpositus</i> (e-scale with $b_b$ , final a)	—
* <i>Lydius regularis</i> (f-scale with $b\frac{4}{2}$ , final f)	Auth. f-mode with $b\frac{4}{2}$
<i>Lydius transpositus</i> ( $b_b$ -scale, final $b_b$ )	—
<i>Hypolydius regularis</i> (c-scale with $b\frac{4}{2}$ , final f)	Plag. f-mode with $b\frac{4}{2}$
* <i>Hypolydius transpositus</i> (f-scale with $b_b$ , final $b_b$ )	—
* <i>Mixolydius regularis</i> (g-scale with $b\frac{4}{2}$ , final g)	Auth. g-mode with $b\frac{4}{2}$
<i>Mixolydius transpositus</i> (c-scale with $b_b$ , final c)	—
<i>Hypermixolydius regularis</i> (d-scale with $b\frac{4}{2}$ , final g)	Plag. g-mode with $b\frac{4}{2}$
* <i>Hypermixolydius transp.</i> (g-scale with $b_b$ , final c)	—
* <i>Aeolius regularis</i> (a-scale with $b\frac{4}{2}$ , final a)	—
<i>Aeolius transpositus</i> (d-scale with $b_b$ , final d)	Auth. d-mode with $b_b$
<i>Hypoaeolius regularis</i> (e-scale with $b\frac{4}{2}$ , final a)	—
* <i>Hypoaeolius transpositus</i> (a-scale with $b_b$ , final d)	Plag. d-mode with $b_b$
<i>Ionicus regularis</i> (c-scale with $b\frac{4}{2}$ , final c)	—
* <i>Ionicus transpositus</i> (f-scale with $b_b$ , final f)	Auth. f-mode with $b_b$
* <i>Hypoionicus regularis</i> (g-scale with $b\frac{4}{2}$ , final c)	—
<i>Hypoionicus transpositus</i> (c-scale with $b_b$ , final f)	Plag. f-mode with $b_b$

One reason why this table shows each mode in both Systems is an obvious desire for systematization and symmetry: the Regular System is justified by the existence of a medieval equivalent in eight cases on twelve, the Transposed one in six cases on twelve. The ultimate justification of Praetorius's doctrine, however, must be found in a puzzling aspect of the modal theory to be discussed presently. No mode has  $b$  as final; the well-known reason is that its medieval equivalent, the e-mode with  $b_b$ , was quite rare in plainsong and even more sporadic in modal polyphony. Yet, Praetorius does tabulate the g-modes with  $b_b$ , as Dorian and Hypodorian Transposed, while this mode was even less frequent than the e-one with  $b_b$ .

Actually, melodies with  $g$  as final and a  $b_b$  do exist, but they are not classified as belonging to the g-mode. Indeed, the intervals of their scale are identical to those of the d-mode with  $b\frac{4}{2}$ , so that they are usually classified as belonging to modes 1 or 2 transposed. This classification, which already was in use in the Middle Ages, is to some extent conventional. But the important point is that, in the Middle Ages already, it had been admitted that the d-mode could be found transposed in notation.

Praetorius does not actually tabulate his modes as scales: he merely gives the notes bounding the modal octave and the final. He shows these three notes for the Discant and the Bass, adding that the Tenor is identical to the Discant, the Alt to the Bass. I reproduce the information concerning the Discant. The Bass has plagal octaves in authentic modes and authentic octaves in plagal modes. In polyphony, the distinction between authentic and plagal modes is in any case rather academic.



This, moreover, is not true of the d-mode exclusively. Several melodies, belonging to various modes, appear transposed in medieval manuscripts. The purpose of these transpositions, which often are up a 4th or a 5th, has not yet been fully elucidated<sup>6</sup>. For the present discussion, however, it will suffice to acknowledge the fact that a device similar to Praetorius's two Systems already existed in the Middle Ages. Although the modern tendency has been of rewriting these melodies in their theoretical key, modern chant books still include instances of transpositions up a 4th or more often a 5th. Thus, it appears that what Praetorius showed with his two Systems were the two possible writings for each mode, the two keys in which each was likely to be found in notation.

In each case, one of the two Systems was written in high clefs (see the \*). As Praetorius stated in chapter IX, this writing was not at a convenient pitch and had to be transposed in playing. Chapters VI and IX together turn out to imply a set of rules for transpositions similar to those illustrated in the tables of Part I of this communication. The early-17th-century composers had to make a choice between the two possible writings for each of their compositions. Pitch cannot have been their main criterion, since there was no necessary relation between the key in which a piece was written and the pitch at which it would be played. The mode, or the writing in which they knew the cantus firmus on which their music was based, must have been more determinant. The players, on the other hand, had no means of knowing the pitch intended by the composer — who was unable to specify his intention even if he had any precise one. Their aim, when they decided to transpose or not, must have been merely of bringing the piece within a convenient range.

#### 6. Renaissance pitches -

The transposing harpsichord

It is clear that Praetorius's set of rules for transpositions could have been valid at one pitch only, probably his Chamber Pitch. Any other pitch would have implied other rules<sup>7</sup>. It would be particularly interesting to know

<sup>6</sup> G. Reese, Music in the Middle Ages, London 1941, 157 ff., discusses some of the possible purposes of the transposition as 1) to conceal chromatic alterations which the untransposed melody would include, 2) to conceal modulations within portions of the melody. If, for instance, a melody in mode 2 included an  $e_b$  at some places, transposing it up a 5th would change the  $e_b$  into  $b_b$ ; it may then appear that the portions with  $b_b$  are in mode 2 transposed up a 5th, those with  $b_b$  in mode 4 transposed up a 4th. However, instances can be found of transposed melodies which could be written without any trouble in their theoretical key. My own conviction is that this device must be somehow linked with the medieval practices of transposition described in Part I of this communication. This will be one of the topics of the study from which the present communication is derived.

<sup>7</sup> Praetorius's 'rule of the high clefs' became quite general in the 17th century: it is the well-known chiavette doctrine (cf. Mendel, op. cit., 336 ff.). This does not necessarily mean that Praetorius's pitch gained general acceptance: it is possible, through octave transpositions, to choose which System will be written in high clefs. Praetorius himself writes some modes an octave higher or lower than their theoretical place in the scale; even more, he presents some of them in two notations an octave apart, so implying the doctrine of the low chiavette.



whether some pitches — and the corresponding set of transpositions — were considered better than others. The factors involved are of such complexity, however, that the matter remains highly conjectural and that any result arrived at should be considered with utmost caution. After all, the most important point is that the Renaissance notation cannot be taken as a precise indication of the pitch at which the music was played and that that pitch may have varied with places, times and circumstances.

The overall range of the modal octaves which Praetorius describes as being at a convenient pitch is F-b for the Bass (and f-b' for the Alt), b<sub>0</sub>-e" for the Discant (and B<sub>0</sub>-e' for the Tenor). This roughly corresponds to the vocal ranges he describes elsewhere<sup>8</sup> and it seems therefore that the convenient range was the same on polyphonic instruments as in vocal music. From this premise, it would be possible to speculate on Praetorius's pitch, but the result would remain quite uncertain<sup>9</sup>.

Some modes must have been utilized much more often than others in the Renaissance. About 60 % of the Gregorian repertory is in mode 1, 7 or 8 and one may suppose that the proportion remained similar in modal polyphony. The new major mode must also have been quite frequent. One may conclude that a good majority of the polyphonic pieces were written in one of the following six modes: Dorian (mode 1), Mixolydian (mode 7), Hypomixolydian (mode 8), Aeolian (mode 1 with b<sub>0</sub>), Ionian or Hypoionian (both major).

At Praetorius's pitch, following the indications of the table above, the modal octaves utilized in the Discant for these six modes were c'-c" (Ionian regular, Hypoionian and Mixolydian transposed) and d'-d" (Dorian and Hypomixolydian regular, Aeolian transposed). The overall range for the six modes is c'-d", which falls exactly in the middle of the Discant range b<sub>0</sub>-e". Thus, the six modes most frequently utilized were the easiest to sing and to play, which was to be expected.

A similar result could have been reached by choosing the other System for each of the six modes. The modal octaves utilized would then be f'-f" (Ionian transposed), g'-g" (Mixolydian and Hypoionian regular, Dorian and Hypomixolydian transposed) and a'-a" (Aeolian regular). The overall range for the six modes would become f'-a" and the corresponding overall Discant range e'-b"<sub>0</sub>. This would correspond to a pitch roughly three tones lower than Praetorius's (or, if the modal octaves are taken an octave lower, to a pitch roughly three tones higher than Praetorius's). This pitch would have about the same advantages as that advocated by Praetorius. In general, one could say that pitches about three tones apart must have been for many purposes equivalent<sup>10</sup>. This, it must be stressed, remains valid independently of the

<sup>8</sup> De organoetaphia, 20. The ranges there described as easy to sing are C-b<sub>0</sub> for the Bass (which must account for exceptional low voices), B-e' for the Tenor, f-a' for the Alt and c'-e" for the Discant.

<sup>9</sup> For instance, one could say that the 2<sup>nd</sup> which human voices could most easily sing is about G-f' at modern pitch, to be compared with Praetorius's F-e". Praetorius's pitch would thus be a tone higher than modern. This is close to the result arrived at by Vandel (*op. cit.*) but it may be wrong by a tone or a 3<sup>rd</sup> because human voices easily cover more than a 2<sup>nd</sup>. See also Thomas and Rhodes in *The Organ Yearbook* II, 1971.

<sup>10</sup> It would seem that Renaissance makers found the distance of a 4<sup>th</sup> or a 5<sup>th</sup> between the two pitches more convenient than that of a tritone. The argument could be furthered to justify pitches a tone apart, as between the pitches respectively a 4<sup>th</sup> and a 5<sup>th</sup> higher or lower than any reference.



actual frequency level of any of the two pitches. But let us leave the domain of conjecture and shortly examine the case of the transposing harpsichord, the purpose of which should now be quite obvious.

The transpositions most often practised in the early 17th century were up or down a 4th or a 5th. On the transposing harpsichord, passing from the upper keyboard to the lower effected a transposition down a 4th (or up a 5th). The aim of the transposition practices of the time was not of reaching a precise predetermined level, but merely of bringing the music within a convenient range: not much precision was needed. Therefore, the transposition down a 4th on the transposing harpsichord could replace the transpositions down a 4th or a 5th that would have been practised on other instruments.

For the sake of the argument, let us suppose a transposing harpsichord of which the upper keyboard would be at Praetorius's pitch<sup>11</sup>. In order to transpose pieces written in high clefs, the harpsichordist would only have to play them on the lower keyboard. In short, the transposing harpsichord permitted to play the whole keyboard repertory within a convenient range without ever having to perform a transposition. In a way, the two keyboards correspond to the two Systems for each mode. The distance of a 4th between the two keyboards is an arbitrary choice of the Ruckers, intended to replace the distance of at times a 4th, at times a 5th, between the two Systems: they could as well have made instruments with the two keyboards a 5th apart.

. . .

It is time to conclude. I have spent much time trying to prove that the preference for transpositions to the 4th or 5th in the 16th and early 17th centuries was a survivance of a medieval practice. Even so, some readers may not be convinced and consider it naïve to explain the transposing harpsichord by the fact that Ruckers's contemporaries transposed to the 4th only. I can add a last argument, which I will leave everyone free to develop: keyboard instruments tuned in unequal temperament permit playing in a limited number of keys only; for the same reason, they permit a limited number of transpositions. Of the transpositions performable, the ones to the 4th or 5th are the most frequent. For instance, a piece in c major including modulations to f-major, g-major and d-major could only be transposed up or down a 4th or a 5th on an instrument in meantone temperament ...

On the other hand, my conclusions should not be taken for more than what they are intended to mean. It is clear that many early-17th-century keyboardists were able to perform complex transpositions, even at times involving retunings of their instrument<sup>12</sup>. The transposing harpsichord certainly was not progressive in its time; the Ruckers were traditionalists. The later evolution

<sup>11</sup> The Ruckers transposing harpsichord must have been somewhat lower than that, actually.

<sup>12</sup> Keyboard instruments with split keys must have been quite useful for transposition purposes. It must be noted in this respect that the transposing harpsichord, with its double string for  $e_b/g\#$ , permits one key more than a normal instrument, as if one of its keys, either  $e_b$  on the upper keyboard or  $g\#$  on the lower one, was split.



could be summarized as follows: as the modes were progressively made to all resemble either the major or the minor, the key in which a piece was written lost its modal significance and was more often understood as an indication of the pitch at which to play. The trend toward equal temperament contributed in making all keys identical to each other, but for pitch, and made remote transpositions possible. Pitches were progressively standardized and their number lessened. The apparition of the standard pitch is directly linked with the coming into practice of equal temperament and the replacement of the modal system by the major/minor tonal one.

At the same time, pitch was more and more considered to be essential for the correct rendering of a piece. To a large extent, the modern concern of players of early music with the 'authentic' pitch is a heritage of the Romantic period and their suspicion against  $a' = 440$  at times resembles snobbery. The Renaissance musicians must not have considered pitch to be of much more importance than, say, the instrumentation which often was left to the players' discretion.

JEROME OF MORAVIA

FoMRHI Com. 58

Anthony Laines

Now that Jerome of Moravia's tunings are coming to the fore in your always interesting and constructive Bulletin, may I, though not a fiddlist myself, offer a few comments.

(1) Jerome's tunings are given on p.34 (Jan.1977 issue) presumably following the placing order of the strings on the instrument, so that from this aspect the 2nd arrangement matches the 1st save in the tuning of the near-side string up to g'. So far as I know, this is a new interpretation. Hitherto, from Parum to Bachmann (presumably competent Latinists), interpreters have picked out the phrase "arranged, however, according to the sounds" as indicating the order C d etc. (as against a G etc. in the 1st tuning). Yet the text, plus marginal additions, do seem to permit Segerman & Abbott's reading. So important is this unique source, Bordani and all, that it is imperative that some very expert Latinist be now called upon to try to clear the matter up, stating which reading may be considered correct, or whether either can be.



(2) I think that even among people like your readers, who know what is meant, the word 'drone' should be avoided in the context of Jerome's viella, since it suggests a sound effect which is not implicit in the treatise. With things like Greek liras 'drone' may be apt, and perhaps also, by inference (pre-Bachmann, incidentally), with medieval little 3-string fiddles. But Jerome might, of course, refer to 'broken' effects, especially with the remarks on keeping consonance, not to mention the marginal's thumb. Better keep to the Latin term concerned, 'bordunus'.

(3) The well-known conflict between Jerome's 2-string rubeba and the common 3-string fiddles of the day. Bachmann's explanation - incidentally reading Jerome's two rubeba note-names an octave higher in defiance of C fa ut (c, as he knew perfectly well) and inconsistent with his own readings for viella - that the higher string was a double course, is dubious. Among extant 3-string folk fiddles (and the extinct Russian gudok) on which Bachmann relies so much, such a double course is rare; in fact I have met it only on the Pontic lira as this is now popular in Greece itself. Panum observed that 'rebec' is never mentioned where 'rubebe' is named. But 'rebec' is a good deal later than Jerome of Moravia. However, from around his time, the two best-known 'rubebe' quotes in French romances - in 'Cléomadès' and in 'Rose' part 2 - both put the word along with 'lëu' and 'kitaire'/'quitaire', names of contemporary Moorish origin. The little 3-string fiddle was then hardly Moorish (if ever it had been, which is doubtful) and there seems no reason for a big-time Parisian musician like Adenet (author of 'Cléomadès') giving a Moorish name to it. In this case, 'rubebe/a' may have been actually a 2-string rabab (Cantigas, etc.), for which Rouanet, in Lavignac, cited a modern tuning d a which is, I believe, realistic and also matches Jerome. Whether one can find a rabab (a gamba) in Northern French iconography, I do not know; but Jerome's remark that the rubeba is held between thumb and index as the viella is also held, could apply equally with 'braccio' and 'gamba'.

(4) Changing to another subject, I feel that Segerman & Abbott are over-reacting to Lawrence Wright's thesis on Citole/Cittern (probably appearing in GSJ about April: some may say, why not sooner? But it is a lot to print). I had long thought that these words needed examination and was very glad to receive Wright's paper. But his conclusions need to be aired - and will very likely be contested - so it is premature (in more senses than one) to quote him immediately as gospel.



# THE NAMES, STRING LENGTHS AND PITCH STANDARDS OF EXTENDED-NECK LUTES OF THE 17th CENTURY

D Abbott & E Segerman

Robert Spencer's recent paper "Chitarrone, Theorbo and Archlute" (1) was a tremendous work of collecting up information on developments in the lute family in the time between Dowland and Bach. He has cleared up many misconceptions about chitarrones and theorboes, and presented a mass of evidence on these instruments. But the story is complicated and far from complete. We would like to be able for every type of instrument to correlate all the attributes: name, size, shape, number of courses and which are single and double, relative tuning, nominal tuning, pitch standard, string materials and tensions, the time and place and social circumstance when the instrument was used, and the music and style of playing.

We shall here focus on the problem of relating the name to the other attributes, concentrating on string lengths and tunings. Praetorius (RS47) and Talbot (2) both give names as well as dimensions, numbers of strings and nominal tunings and this is supplemented by measurements from paintings as described in Comm 39. We have collected the information in the following table, which will need some explanation:

Brackets in the table are used for references and for our interpretations of the evidence as set out in the notes following the table. Unbracketed information is 'raw' data, and in column P, deductions from our conclusions on string ranges (3).

The columns give:

<u>Name</u>	as given in the source
<u>Source</u>	
S	String lengths in cm. of the "fingerboard strings", ie. those which are fingered with the left hand.
R	Ratio of the length at the (longest) diapasons to fingerboard strings.
C	Courses: numbers on fingerboard and diapasons.
H	Highest strings: which course and the nominal pitch (ie. notes that were stated)
I	Tuning: tuning type and nominal pitch of first course:- Renaissance Lute: Diatonic basses and f f e f f (tablature short-hand indicating unisons course-to-course starting from the bass). 'D-minor': French baroque tuning: diatonic basses plus f d e f d called 'B-flat' in Burwell (RS29), 'New' in Mace (RS16) No. 3 in Dufant (4). Flat French = diat. basses + f f d e d.
P	Pitch standard: the number of semitones below Cammerthon (Com 38) that the pitch standard needs to be for the highest string to be safe. All the instruments are presumed to be strung in gut (3) unless otherwise stated.



## NOTES ON THE INSTRUMENTS

- A) Colachon or Calascione. The neck is longer than half the string length hence we class it an 'extended-neck' lute. In all the other instruments we consider, the extension applies only to the non-stopped bass strings. The tunings can be characterized as bandora or double-bass guitar.
- B) This instrument is not mentioned again until Baron (185-41) in 1727 mentioned that "Paduan Theorboes were more convenient to handle and only measured five feet in length". His source was almost certainly Praetorius and this is not a statement supporting small theorboes in the 18th century. At the end of his article Spencer's quote from Baron (which follows on from the above) erroneously identifies Baron's contemporary theorbo with the above Paduanische Theorba.
- C) There are several statements from the first half of the 17th century, during which
- D) the name 'chitarrone' was used, indicating that it was equivalent to 'tiorba', but
- E) the extent of this equivalence is always a matter to question since it may relate to function rather than size and structure, or saying "A is a B" might mean "A is in B category" without mentioning that some of B might not be accepted as A.

There are artistic depictions and surviving instruments from Italy during this period with stopped string lengths and string-length ratios intermediate between Praetorius's luto attiorbata and Roman theorba (something like 5:3) but what Italian name to associate with it is a matter of conjecture. One of these is in the Lady Mary Sidney portrait and so it may have been the 'theorboe' of England during this period. Castoldi's portrait (1622) shows him playing one of these intermediate instruments. He wrote for tiorba, tiorbescha and tiorbino (an octave higher than the theorbo - an instrument that can be readily associated with a few museum specimens), and this intermediate instrument could have either been a small tiorba or a tiorbesca. Many publications for Chitarrone assumed a pitch a tone higher than that given by Praetorius and if they referred to the same pitch standard then 'chitarrone' is another candidate for the name of this smaller instrument. Banchieri's Chitarrone with the second course at the higher octave is almost certainly a smaller instrument and it's tuning size relationship could be the same as the English single theorbo.

- F) Talbot's statements about the different variants of English Theorboes are
- G) difficult to interpret. We can make no consistent association of the names
- H) 'double Theorboe' and 'single theorboe' with his statements on double and single courses ('double ranks' is the expression used for double courses) and we think these terms relate to range or size as was common usage with other instruments at the time.

We associate the statement "The 1st nutt carryes 3 single Bass Strings. . . . . Total of Theorbo Strings 22. Ag. " with the instrument he measured, F in our Table. The subsequent "Q. and Whether this be true for single Theorbo? no." implies that the measured instrument was a double theorbo. This instrument has 22 strings in all.



REF.	NAME	SOURCE	S	R	C	H	T	P
A	Colachon (calascione)	Talbot c. 1690(2)	97½	only 1 nut	6	a	CDGcea or A,DGcca	ok
B	Paduanische Theorba	Praetorius 1619 Pl. XVI, 1 (RS47)	97	3:4	8 + 8	3rd a	Ren. lute g	ok
C	Lang Romanische Theorba Chittaron	Praetorius Pl. V, 2	89½	2:1	6+8	3rd a	Ren. lute g	ok
D	Chitarrone, tiorba	Piccinini 1623 (RS 1)	-	-	6+8	3rd -	Ren. lute -	-
E	Chitarrone, tiorba	Banchieri 1609 (RS3)	-	-	13 total	1st g' or 2nd d'	Ren. lute g' or Ren. lute g	- -
F	English (Double?) Theorbo	Talbot's measure- ments	88½	golden mean. 5 steps	6+11 (or 8)	(3rd b)	(Ren. lute a)	(ok)
G	English Theorbo with double ranks and English Double Theorboe	Talbot's notes	-	-	6+8	3rd b	Ren. lute a	-
H	English Single Theorboe	Talbot's notes	-	5 steps	6+7	2nd e'	Ren. lute a	-
I	French Theorboe	Talbot	(86)	-	6+8	3rd b	Ren. lute a	(ok)
J	Lesser Fr. Theorboe	Talbot	76	5:3	6+8	3rd e'	Ren. lute d'	3
K	Arch lute	Talbot	68½	9:4	6+7	{ 1st g' 1st f'	Ren. lute g' D-minor f'	4 2
L	Testudo Theorbata	Praetorius Pl. XVI, 2	68	3:2	6+8	1st g'	Ren. lute g'	3 if 1st of steel
M	Arciliato or Liuto (Liuto attiorbata)	Piccinini	-	-	6+7	1st -	Ren. lute -	-
N	Arciliato	Mersenne fig 7b (RS fig 9)	-	3:2	7+4	1st a'	Ren. lute a'	-



REF.	NAME	SOURCE	S	R	C	H	T	P
Q	Angel lute	Talbot	66	3:2	10+6	1st e'	Diatonic e'	ok
P	-	Molenaer c. 1630 (RS fig 1)	longer than 69	5:4	6 + 4	-	-	-
Q	-	Molenaer c. 1630 National Gallery No. 1293	61	7:6	-	-	-	-
R	Livt	Falken- hagen 1755 (RS fig 23)	60	4:3	8 + 5	(f' RS)	('D-minor')	(o k)
S	English Two- headed Lute	Talbot	60	4:3 4 steps	8 + 4	1st f'	'D-minor'	ok
T	-	H. M. Sorgh (RS fig 19)	63	4:3 4 steps	(8+4)	-	-	-
U	The French Lute half of the Lute Dyphone	Mace 1672 (RS fig 20)	-	4:3 4 steps	8 + 4	g'	Flat French g' (RS)	-
V	-	Gaultier c. 1630-33 (RS fig 21)	(55)	4:3 4 steps	(8 + 4)	-	-	-
W	-	G. Netscher Musée de la Fere	49	5:4 4 steps	? + 4	-	-	-
X	Arch mandore	Talbot	48	9:4	6 + 7	1st c''	Ren. lute c'' or own special tuning	3



G in our table refers to the tuning given for 'English theorboe with double ranks' and 'Double Theorboe' and the completely consistent later paragraph "Q. Double Theorbo . . . . . Crevecoeur. This may be = 27 Strings." The discrepancy between the stated numbers of bass strings in F and G can be accounted for by the following possibilities:

- (i) G has 11 basses as stated comprising 8 diatonic ones as has the double theorbo plus 3 extra chromatics within the interval, in the style of Piccinini,
- (ii) 11 diatonic basses is within the range of the strings but highly unlikely,
- (iii) Talbot was in error in his statement "all single basses" for F and his measurement table giving " . . . . . upper Nut with 3 single strings . . . . 2nd with 2 single strings . . . . 3rd with 2 and 4th with 2 and 5th with 2" implies singles only on the upper and 2nd nuts, giving a total of 8 bass courses in agreement with G.

We take the section 'The present Theorboe has 7 Basses, 6 Trebles all single, sometimes double . . . . Theorboe Single' all to refer to the Single Theorbo presented as H in the table. The e' top string is 6 semitones too high for the measured instrument F and the number of basses is different which supports the case that F was not a single theorbo.

The final note "Mr Lewis . . . ." involves another instrument with 7 trebles. No size or tuning information is given.

The Golden Mean string-length ratio is very closely 13:8.

- I) The stated tuning of the French Theorboe is a fourth below the Lesser French
- J) Theorboe. If it were in the same pitch standard (at least 3 semitones below
- K) Cammer Thon) its string length on the fingerboard would have to be at least 100 cm. That it was in a higher pitch standard than the arch lute is indicated by Talbot's statement "This [the French Theorboe] fitter for Thorough Bass than Arch Lute its Trebles being neither below the voice nor Instrs in Consort as Arch Lute. nor Trebles far too distant from Basses." The lesser French theorbo was at a similar low pitch standard to the archlute. That it was bigger than, and lower in absolute pitch than the Lesser French Theorbo is indicated by the fact that the lesser theorbo is, of the two, singled out as "fitt for lessons" which presumably require a small string length for left-hand agility. Taken altogether this determines the most likely string length for the French Theorbo as about 86 cm. if tuning was in Cammer Thon pitch standard, the normal standard for a consort dominated by violins.
- L) We expect that the 'testudo theorbata' depicted by Praetorius was the 'liuto
- M) attiorbata' that the Italians used. Piccinini stated that the difference between
- N) 'liuto attiorbato' and 'arciliuto' was but a matter of terminology. This instrument was often just called 'liuto' in Italy. Mersenne's 'arciliuto' has the same 3:2 ratio of string lengths as Praetorius's 'liuto attiorbata' and this leads us to suspect that this proportion may be an essential factor in identifying the instrument.

Talbot's late 17th century arch lute is essentially the same instrument as these early 17th century arciliutos but with the diapasons made longer. It may have been deliberate that the string-length ratio 9:4 is the square of the earlier 3:2 ratio.



- O) The Angel lute appears to be the earlier arciliuto with a new tuning. The tuning in a diatonic scale throughout reduces the range to two octaves and a tone, but the advantage is that the notes do not have to be stopped and can sound a long time: Talbot quotes Crevecoeur "This and all lutes more proper for slow and grave lessons than for quick and brisk by reason of the continuance of sound when touched which may breed discord."
- P) Both these lutes have a bent-back pegbox for the stopped strings, and a neck extension with another bent-back pegbox for the basses. We will not generalize about essential features of these instruments till we have seen some others, but we suspect from the differing string lengths and ratios that they were simply conversions of existing lutes by lengthening all the unstopped basses to improve their tone, and adding new pegboxes.
- Q)
- R) This 'German baroque lute (? or theorbo)', as Spencer calls it has a string length of 60 cm. makes it just right for the D-minor tuning Spencer gives, in Cammer Thon pitch standard. The Schelle 1721 instrument (RS fig 22) with a string-length of  $70\frac{1}{2}$  cm is typical of the surviving ones, and it would have to be tuned at least 2 semitones below Cammer Thon for the top string to last long enough to be useful. The other type of German baroque lute, is, as Spencer mentions, essentially a conversion from the 11 course classical French baroque lute by addition of a bass rider carrying 4 pegs for 2 more bass courses with a separate nut making these strings about 2 frets longer than the others.
- S) These are lutes with 4 small nuts on the neck extension. Talbot's lute has just the right string-length for its stated D-minor tuning with treble f' in Cammer Thon. Mace only gives his string length indirectly on p.205: "The length of the Strings of Both [ie. French and English halves of the Dyphone] from Bridge to Nut, are Exactly Consort-Pitch: The Treble Strings of Both, to be Pitch'd to G-sol-re-ut". If 'Consort Pitch' meant Cammer Thon this would mean about 54 cm. length; if it meant the tone-lower pitch that English viols played in the length would be the same as Talbot's. The theorbo half of the Dyphone is not included here since it is unrepresentative, having the tuning of an archlute. Mace wrote that he made it a 7th higher than his usual theorbo which, as confirmed by the translation table on p.190, was nominally tuned like H.
- T) Gaultier's lute (RS fig 21) appears to be the right size for a Cammer Thon g' treble but this interpretation could be inaccurate.
- U) (i) because the string-length is estimated from the length from the nut to the 5th fret ( $\frac{1}{3}$  the way along) and
- V) (ii) the strings might be tilted in the picture.
- W) A more sure small-size lute of this kind appears in a painting by Netzcher W; here the front of the lute is seen square in the picture plane, and its small string length of about 49 cm. indicates a probable Cammer Thon a' tuning.
- X) Talbot twice noted that the arch mandora was a small version of the arch lute. Since an obvious common factor is the string-length ratio 9:4, this may be a primary characteristic feature that identifies the archlute at this time (and place).



## LOW PITCH STANDARDS

A low pitch level is acceptable for a solo instrument, (eg. "for lessons" as stated for the lesser French Theorboe) where a pitch standard is irrelevant. This is also true if the instrument were used to accompany a voice which sings more comfortably at a pitch lower than written. A low pitch standard is appropriate if the instrument played in an ensemble in which the other instruments used a low pitch standard. This is the case with viols in England, and probably in France, during the 17th century (see Comm. 38).

All of the instruments at low pitch standard discussed here, except the archlute, are just acceptable for being in Praetorius's Chor Thon standard, since a minor third is within the variation expected when Praetorius said that the Chor Thon standard was approximately one tone below the Cammer Thon standard. The excessively low standard for the archlute is relieved if we consider that the measured instrument could have been usually tuned according to Talbot's alternative "Flat or Sharp tuning the same as Fr. lute". This makes the first course nominally a tone lower at f'.

We have been explaining the long string lengths together with high stated pitches of some of the instruments in terms of low pitch standards employed with these instruments, while other instruments within the same musical culture were tuned in the higher Cammer Thon pitch standard. We regard the quote from Talbot given in section IJK, where he compared the uses of the French theorboe with the Arch lute, as necessarily implying that the arch lute is at a lower pitch standard than the French theorbo. Baron's statement (quoted towards the end of Spencer's paper) defining the different circumstances in which the lute and theorbo were used is relevant to much of the 17th century as well. The powerful large theorbo which played with large groups of musicians in church and in operas played in Praetorius's Cammer Thon (about  $a' = 415$  Hz). This is because the pitch in churches was determined by organs which, from Praetorius's time a century before Baron, were built in the standard Cammer Thon pitch, while in the opera orchestras and other large ensembles, pitch was maintained at the same level by a constant straining towards higher pitches for increased brilliance being kept strictly in check by the rate of breakage of the violin E-strings. In chamber groups, brilliance was not needed so the pitch standard could be more relaxed, and was very often about a tone lower. Illustrations showing violins in such ensembles show the bridge much closer to the tailpiece than its normal position between the nicks in the f-holes. This is discussed further in Com. 38.

We have here discussed the various types of instruments with extended bass strings and tried to relate the name, string lengths and tuning where such data are available, and come to some conclusions concerning pitch standards by applying the properties of the strings used. These data are not sufficient to identify unambiguously all surviving and depicted instruments of these types, but we hope that this study has illuminated a few of the points left unclear in Bob Spencer's excellent summary of the data.



## REFERENCES

(RS) indicates information in Robert Spencer's paper listed below, footnotes eg. (RS2), illustrations eg. (RS fig 19).

- (1) Robert Spencer (1976) Chitarrone, Theorbo and Archlute, Early Music vol 4 no 4, p 407.
- (2) Talbot (c. 1690) See Michael Prynne (1961) James Talbot's Manuscript: IV. Plucked Strings - The Lute Family, Galpin Soc. J. XIV, 52.
- (3) The authors: Strings in the 16th and 17th Centuries, Galpin Soc. J. XXVII (1974) and Com. 3, later expended into Gut Strings, Early Music vol 4 no 4 (1960) p 430.
- (4) Andre Souris (1965) Ouvres de Dufaut: Edition et Transcription. CNRS.

Peter Ecker

FoMRHI Com.60

### Instrument Research through Artist's Depictions.

I would like to suggest that we should not take artists depictions of instruments too seriously nor to deduce from them a mode of playing. Artists are not the best people to portray the world as it really is. This may sound ridiculous since portrayal is their chief performance. I contend that if any credence is to be given to their work, then future historians will deduce that in our age the world was going round in the wrong direction. This is because if an artist wishes to illustrate an evening scene he invariably puts in a moon and in nine cases out of ten it is a morning moon. In other words he regularly draws the crescent the wrong way round.

I also find that depictions of guitars is crude to the extreme even in the most erudite instances. The record sleeve of John Williams playing the Rodrigo Concerto carries illustrations of two guitars. One is a cheap steel-strung model and the other I would not light a fire with. Guitar tutors invariably have an illustration of a guitar on the cover and invariably it is the wrong sort, or wretchedly drawn.

So if we can do these things today and leave them behind for future generations to study and make their deductions about us therefrom how safe are we with mediaeval depictions ?



Jeremy Montagu

Peter Ecker sent me his brief Communication on Artist's Depictions to pass on to Djilca, which gives me the unfair opportunity to comment upon it in the same issue as it appears in, which I hope he and other readers will forgive.

I have used iconography extensively, for evidence of instrument types and construction, for evidence of use and possible combinations, and for evidence of playing techniques, as readers of my books on early percussion and early instruments in general will know. I am convinced that we should take each period, each source and each artist on its or his merits. For example, the scholar who relies either on the Isenheim Altar-piece or on a Picasso for details of instrument construction or playing technique needs his head examined - on the other hand, both can be relied on as evidence that viols, in Mathis's period, and guitars, in Picasso's, were used. Equally idiotic is any scholar who does not rely on Memling (eg the dust-wrapper of my World of Medieval & Renaissance Musical Instruments) or Baschenis (Early Music, April 1977, p.175) for constructional details - though, also on the other hand, the Memling at least is not evidence that these particular instruments were used together as an orchestra.

To stick to the same two sources, I used photos of the Lincoln Cathedral angel choir because I think that those carvings are thoroughly reliable for constructional and playing technique details; I avoided Beverley Minster (same issue of EM, first article) because far too many of them seemed to me to be thoroughly unreliable (eg, EM p.148, the double tabor pipe, the way in which it's held, the size of the beater; the left hand of the manders player, and so on).

I think that one has to look at each carving, picture, or whatever and compare it with what we already know, to start with. One can also look at the non-musical objects in the same source and compare them with surviving examples. One must also remember that an artist may draw very precisely an object, while neither he nor his model may know how it is held or played. One must also remember that the artist, to take-up Peter Ecker's example, paints in broad daylight - he does not actually paint in moonlight (I thought anyway that the C or D depended upon whether it was waxing or waning, not the time of day).

I do, however, entirely agree with him as to record companies' choice of instruments for their sleeves and publisher's choice of tutor covers. I suspect that most recording artists and tutor-writers wait in fear and trembling to see just how horrible their work is going to look. But there is nothing that we can do about it - at that stage the designer (I should have put him in capital letters - he often deserves capital punishment, which is ungrateful of me, for mine has done me very well on the whole), the DESIGNER is the final arbiter and no one can argue with him. But he is a modern phenomenon, and if we were to ignore the work of earlier artists only because ours were so unreliable, we should be ignoring a vast amount of evidence that can be gained in no other way.



DETECTION OF REINFORCING BARS IN INSTRUMENTSGordon Wood

There are a number of ways in which internal reinforcement in musical instruments may be detected and measured even though the instrument be unopened and where a rose restricts access to the interior. Three possible methods employ ultrasonics, fibre optics and X rays. It is of course evident that few, if any, instrument makers will possess the necessary instruments required for these techniques but that does not mean that they are unavailable. All Universities, Polytechnics and some Technical Colleges will have one or all of these tools and a telephone call could be all that is necessary to gain access to them. In most Physics Departments there is a group or someone working on acoustics and they might be interested in collaborating on work of this sort. Many Mechanical Engineering and Metallurgy Departments use ultrasonic equipment for crack detection - this could be ideal for the purpose. The difficulty at the beginning is to locate the right man in such an establishment. My advice is to ring up, ask for the Physics (or Mechanical Engineering or Metallurgy) Department office and ask to talk to a member of the lecturing staff concerned with acoustics (or materials testing). Once you get that far you ought to be home and dry. Simply explain your problem and ask if anyone would collaborate by giving help and access to equipment.

X ray photographs have often been used to determine internal shapes of wind instruments and could certainly be used to locate ribs on a lute belly, but it might be difficult to determine depths of reinforcing bars by this means.

Fibre optics is a technique in which a flexible light guide, made of a number of parallel glass fibres is used as a probe to examine inaccessible parts and parts with restricted access. For instance equipment of this sort has been used to obtain photographs of various internal parts of the human body.

Ultrasonic equipment is commonly used for finding the positions of cracks and flaws inside solid objects and also for finding thicknesses. A piece of crystal is used to transmit ultrasonic waves from the surface into the body. A second piece of crystal receives waves reflected from a flaw or crack or from the underside of the body and the delay in time between the signals is recorded and is a measure of the depth of the flaw or of the thickness of the body. The transmitting and receiving crystals may be housed in a single probe. One drawback of this system is that in order for the probe to make good and consistent contact



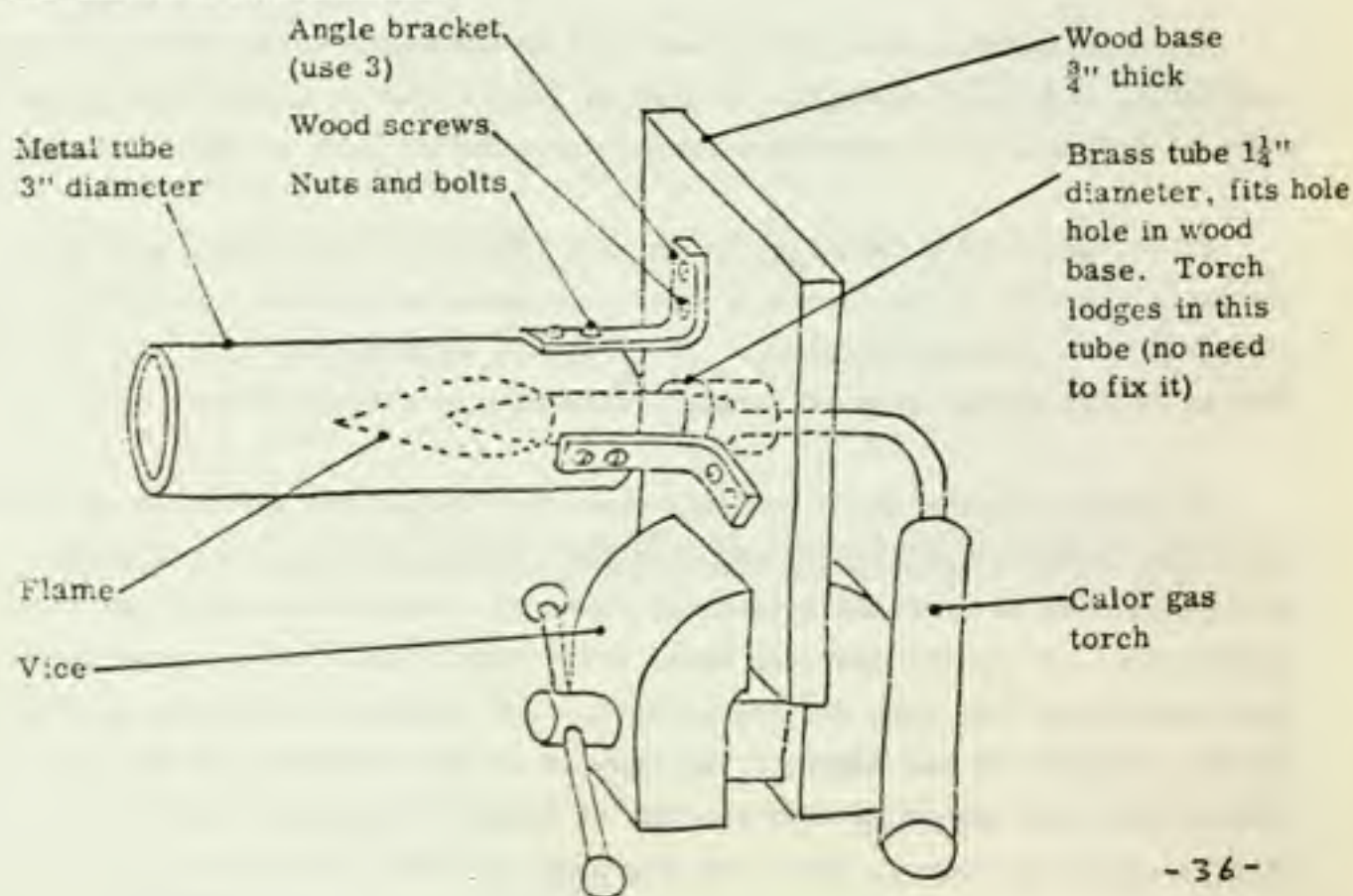
by Donald Garrod, Djilda Abbott and Arthur Young

Here are some ideas for homemade bending irons which we have found to work well, and which provide cheap alternatives to the bending irons available from violin makers' suppliers.

They can be used for the bridges and curved sides of harpsichords, for staves for lute backs, and for the sides of guitars, viols and the like, in fact for any straight piece of wood that needs to be bent. They are quicker and easier to use than a steam box and, of course, you do not need a form.

So as not to over-heat the wood, it may be of help to sponge the wood with water before applying it to the hot tube, however with very thin, wide pieces of wood, such as sides of large bowed instruments, dampening can lead to distortion later on. Old instruments often show burn marks inside -- this is not a great sin! The ideal for this wide wood is to work with the wood dry, and the temperature accurately maintained a little above the boiling point of water. Automatic electrical temperature control is the most reliable; with gas the flame should be turned down enough to get the right temperature, which can be achieved with a little experience. Whichever method of heating is used, a thick-walled tube of a good heat-conducting material is of great advantage in that it provides a good heat reservoir and quickly conducts the heat to where it is needed. If the tube is too lightweight, its temperature will drop whenever the cold wood is put against it. Brass, iron, steel, copper and aluminium are all good heat-conducting materials, but stainless steel less so. You may need a back strap to support the curve in some timbers (Lebanon Cedar or Figured Sycamore, for example). This could be of mild steel or brass about 1mm thick.

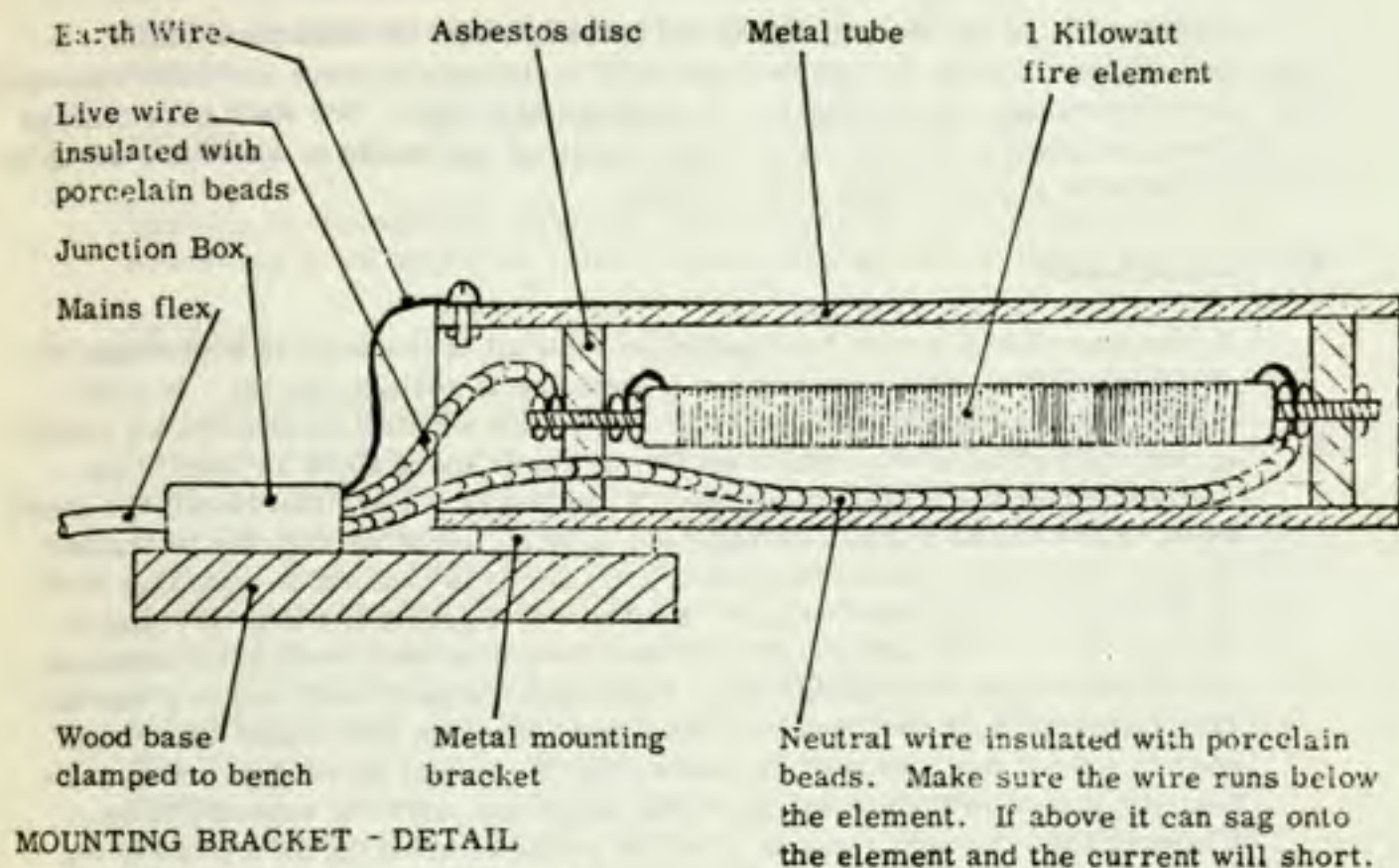
#### GAS-HEATED BENDING IRON





## HOMEMADE ELECTRIC BENDING IRON

Do not run continuously off the mains as this would overheat the iron. Either reduce voltage or use intermittent current to maintain a suitable temperature.



Go slowly in bringing the wood to the shape of the pattern moving the wood back and forth over the iron with a gentle downward pressure.

The drawings show two types of bending iron: one is heated by a calor gas torch, the other works off an electric heating rod for a domestic room-heater, and is intended to run off the mains via a controller - either voltage-reducing or intermittent-switching. The actual size of the tube is not critical. DG making keyboards uses a 3" diameter brass tube 14" long. DA has used lengths of iron drainpipes 2" or 2½" in diameter. Ideally the curve of the iron should be slightly sharper (smaller radius) than the smallest curve on the instrument. AY has a tube that is squashed into an oval shape so that both sharp and gentle curves can be matched. Heron -Allen (Violin-Making as it was, and is, 1885) describes a bending iron of solid copper in two sections with different diameters.



by E Segerman and D Abbott

In Communication 42 we recently criticized some attitudes of museum officials. In reply one of them bitterly complained that early instrument makers and other specialists that use the museums are not angels. He is absolutely right. We shall here redress the balance and discuss the behaviour and attitudes of our brethren which are not up to proper standards of scholarship and morality.

#### A TAMPERING

A museum official cannot be expected to know all of the detailed background on every one of the very large number of items he is responsible for. So it is possible that an instrument specialist could visit a collection and quickly (rightly or wrongly) come to the conclusion that he knows more about an item in the collection than the official in charge. Some people believe that knowledge should equal right and so if given the courtesy of being left alone with the instrument to examine it, they will sometimes try to alter it to conform to what they think it should be. They could be right, but there is a possibility that they may be wrong. Even if they were right what they have done could well have destroyed a vital little piece of evidence that a future scholar could well use in a way that they could not imagine. One may know much about an instrument but one can never know all that will ever be known about it, so one cannot just act on one's best judgement no matter how good that judgement might be expected to be. Clearing away the ugly remains of an old string or breaking off a piece of old glue or varnish or tuning wax that is peeling away is vandalism. The intention may be noble but the arrogance of taking onto oneself the decision of altering and possibly destroying what might be valuable evidence for future scholars is not.

#### B DISASSEMBLY

Disassembling an instrument to examine its parts more closely is a natural course for a scholar to follow. This is an acceptable procedure if one is careful and if it comes apart easily. If disassembly involves force either because of the effects of time or of tight fit as part of the method of construction (as in the case with recorder plugs) it should not be done because of the dangers of damage in both the disassembly and the subsequent reassembly. There is usually another more laborious method of getting the information and a scholar has no excuse for laziness or ignorance about how to develop and use alternative means of getting his information.

#### C PLAYING

The temptation of trying to find what an instrument sounds like is hard to resist. Makers want to know what kind of tone to strive for and the specialists that aren't primarily makers can consider tone as an important piece of scholarly information. Busy, courteous, trusting, generous or poorly trained museum attendants may knowingly or unknowingly give the visiting specialist an opportunity to 'try out' an instrument which has not been properly restored to



playing condition. The strain of string tension or of the moisture shock from blowing or of just vibrating can easily do damage to old materials and joints. Too many specialists follow their selfish interests rather than respecting the instrument and believe the risk is worth taking. The proper approach of course is to make as accurate a copy as one can and then play it to one's heart's content.

#### D THEFT

Thieving of instruments, or more often, bits of instruments (perhaps as souvenirs) is not unknown. Such despicable behaviour needs no further comment.

#### E SECRECY

A much more common immorality is that of instrument makers posing as scholars to gain access to instruments in collections to measure them, and then using this data in their own business interests and not making this data (or scholarly deductions from that data) available to others. This unwillingness to fulfil the responsibilities of a scholar unfortunately pertains to the majority of the maker-specialists we know of who have examined museum instruments. They will usually say that they are too busy making instruments to write up the scholarly work they have done. This is a convenient rationalization and seems less selfish than the reason that some are honest enough to admit, i.e. that they would prefer not to encourage competitors for the instruments they make. They will say that the prize is there for anyone willing to take the trouble of doing what they did, so why should they help the lazy to jeopardize the market for their own instruments. These are often the nicest of people but insecurity about their livelihood overrides their responsibilities to (a) the scholarly community, (b) the museum officials whom they have deceived and (c) the instruments that they examined which, because of their secrecy, will be handled much more by others, with the risks this entails. The consciences of these nice people are troubled, especially those who did their scholarly work with the help of grants from public or scholarly organizations.

#### F PROFITEERING

There are others with rather less conscience who will draw up designs and sell them at very high prices to other instrument makers. This is profiteering of the worst kind, abusing the courtesy offered them by the museums on the basis of their doing scholarly research. They will argue that it is a fair price for all the work and money they put into getting the information and drawing it up. But even on purely commercial terms any business organization expects to pay for its own research and development (R & D) out of sales of its products. It can sell patent rights resulting from its R & D but here the parallel ends since what is being sold here is information that rightfully belongs to all and is not their own invention.



## G MUSEUM EXPLOITATION

Museum officials believe, we feel rightfully, that if their holdings are going to be used by others for commercial purposes, the museums are entitled to receive appropriate fees. This is regularly done by publishers and record companies who use photographs of their paintings and instruments, but it has not been the practice of instrument makers who make and sell copies of their instruments. This is a situation that needs correction. Legally the museums are not entitled to a fee if, as so often is now foolishly done, they allow the maker to make measurements and photographs without assigning the copyright on these over to the museum. The instrument themselves are too old to be covered by copyright but the measurements and photographs are, and instruments made from these would be covered by such copyright. In spite of these legal factors, the truly moral approach for professional instrument makers would be to pay the museum a fee for each instrument copy sold. If this becomes general practice the most serious source of friction between instrument makers and museum officials would be eliminated.

In conclusion, the above are some of the problems that we know to have been created by specialists who examine instruments in museums. Museum officials can surely add much more and we invite such contributions to these pages. We may well have lost friends by writing this but we feel strongly that FoMRHI should be the forum for open expression of all questions of mutual concern, even if it involves criticizing each other.

### Appendix

#### OUR VIEW OF THE MUSEUMS POSITION

As we see it the museums that we are concerned with have the responsibilities of (1) being caretakers of artifacts of the past of our own and other cultures; (2) offering the public opportunities of viewing these artifacts, and (3) offering scholars opportunities of studying these artifacts. Their holdings are irreplaceable and since responsibilities (2) and (3) are for all of the future as well as the present, the preservation role is paramount. They can't take many chances with (2), but the risks involved in (3) where the scholars are allowed to handle and potentially damage artifacts are taken in the expectation of this risk leading to a greater scholarly understanding of the relevant cultures.

One might say that if a museum does not adequately screen applicants for handling and measuring its instruments to make sure that their intentions are scholarly, it is encouraging commercial exploitation. This may be true but how is a museum to judge? Expertise in knowing what others have done will not guarantee adherence to the traditions of scholarship. And a serious student who is careful but doesn't know very much yet should be encouraged. So they tend to err on the side of generosity.

We feel that many museums are too lax in their treatment of visiting instrument examiners and suggest that they should (a) require a written plan of the work intended to be done in the visit and intended publication plans before the visit; (b) allow access only if the plan is sufficiently scholarly in goals and methods; (c) insist on retaining copies (and copyright) on all data collected, ie. have duplicates of all notes, drawings



photos, etc. made before the visitor leaves (all material is surrendered to the museum with developing and duplicating costs, and the originals will be forwarded to the visitor after duplication) (d) the museum undertakes, if the visitor wishes, to keep the data inaccessible to others for up to 6 months, which should be enough time for the visitor to process his data and submit the results for publication (e) after this period the data becomes available to all for examination or duplication at the museum (this can save much subsequent handling of the original instrument) (f) the museum has no responsibility for the accuracy of the data thus collected and made available, and having it does not in any way prejudice subsequent publication of data on these instruments by the museum's own scholars. In the ideal world when museums have all the resources they need, a small fraction of the more robust instruments will be restored to playing condition, and copies, as accurate as possible, will be made of all important instruments (including the restored ones) to indicate what these instruments were really like when being played in their indigenous musical culture. Data on all of these instruments (drawings, photos, etc.) will be available from the museum at a realistic non-profit cost.

Jeremy Montagu sends the following comments.

B I'd like something even stronger about recorder plugs, which some people whip out without any hesitation, and also about flute corks, which it is far more dangerous to move.

C I made myself very unpopular during the course of the 1968 Galpin Society 21st anniversary exhibition in Edinburgh. We welcomed people who wished to measure (we had secured owners' permission) etc and even had some special evening sessions for such purposes, but I refused adamantly to permit anyone to blow any instrument of wood or ivory unless the prospective player had brought appropriate mops etc to dry out afterwards. I said that they would not dream of leaving their own instrument without drying it out, so why should they do it to someone else's? As a result I was, as I say, unpopular but I had preserved the instruments which had been lent to us.

D Small accessories are even more at risk - reeds, contemporary tuning forks, grease pots, spare strings, mutes and so on. Many brass instruments come with two mouthpieces, and sometimes a second one may vanish in this way.

E Careful here; some makers do quite honestly go to a museum as a maker. Nevertheless, I think, and expect that you agree, that the same provisions should apply to them. Whatever the reason for such examination, the results should be made available to the whole community.

F No reason why a design-maker should not sell at as high a price as he likes his 'version' of the original - that is, in effect, his patent. But his accurate plan should be at reasonable price. If this were general, the customers would know what they were getting - an inexpensive plan would be an accurate account (BP as it were); an expensive one would be the makers cook-up (proprietary brand drugs).

G line 10: surely the measurements and photographs are not the Museum's copyright - they could be if they required the assignment, as you suggest, but it's not true that they are.



## Appendix:

Last page, top line: I don't like the surrendering of all material.  
a) the museum will only get rough scribbled notes and sketches (and in my case often mutterings into a pocket tape-recorder).  
b) the visitor may well prefer to do his own photographic processing rather than risk a strange museum ruining the film - if you took colour photographs would you be willing to see what a small local processor could do to them, or be willing for the museum, because its own dark room was busy, to drop your photos in to the nearest chemist? I certainly would not. If the museum will take photos for me, fine, but if not I take my own and have them done by a professional lab which I have reason to trust.

I think that it should be sufficient to exact the promise that copies of all notes, drawings, photographs, recordings (where appropriate) should be deposited in the museum within one year of the visit, which should give ample time, followed by copies of any or all plans prepared for sale at any future date. This should be made a clear condition of access and enforced by the prohibition of further access if ignored. Since all museums are in contact as CINCIM and ICOM members, it would be easy enough to circulate a black-list of those who fail to comply, so that such people would not only be barred from that museum but from all major museums. It should be understood that the copy of a commercial design would be held by the museum as an archive copy - available for visitors to see but not to buy copies of (unless the designer allows the museum to sell them on a reciprocal royalty basis - the museum should get a royalty on copies the designer sells and it could also be done the other way round).

ES and DA reply: Being last in the chain of getting this off to the printers, we will take advantage of the fact to have the last word.

We agree with Jeremy's various points except the one concerning recommendations in the Appendix:

1. Scribbled notes and sketches and mutterings are better than the museum keeping nothing. If a scholar knows that subsequent visitors will see his rough notes and sketches he may be moved either to take his data more neatly or to send clear replacement copies quickly. Incidentally, music historians are trained to read scribbles and rough sketches.
2. Regarding photographs, a museum that lacked adequate facilities could send the film for processing to a firm agreeable to both the researcher and the museum.
3. Giving the researcher a year to send his data to the museum is most hazardous. During that year he could have toured the museums and collected all the information he thinks he wants and the threat of being on a blacklist would have no practical importance to him. Or his interests could change (eg. he found a 'better' instrument elsewhere, or he's made his copy of this one and is off doing something different). Assuming the best of intentions, if the only motivation for processing his data is to fulfill a commitment of no current interest, it takes low priority on his time and often just never gets done. This system is unworkable and as a result our collective reputation with the museums will be lowered and accessibility of the instruments to us will be reduced.

We advocate maximum availability of the information with minimum risk to the instruments. This implies that every measurement taken be made available to the public. If the museum has not the facilities or personnel to do the measurements itself, then it must take effective steps to ensure that any measurements made by an outsider will be made available.



Richard Wood

1. Use ordinary air or surface post wherever possible, if necessary dividing the consignment up into two or more parcels so that the consignment qualifies for the maximum size or weight for each parcel that the Post Office imposes. These are as follows: maximum length is 42"; maximum weight is 10 kgs, and maximum combined girth and length is 6' 7".
2. Don't bother insuring with the Post Office. Our experience of Post Office willingness to settle claims is very poor indeed. Note that the Post Office Guide states that compensation is 'at the absolute discretion of the Post Office'. Until we stopped using the Post Office compensatory scheme sometime ago, we never had one single satisfactory claim for damage or loss.
3. Where a consignment is definitely too large for the post, you are obliged to use air or sea freight. Unbelievably, air freight can be cheaper than surface freight, since the minimum charge for any weight up to a given limit for sea freight is fairly high, whereas the minimum charge for air freight is much lower. The magic weight above which air freight is more expensive is 56 kgs. Above this weight (which is in fact fairly heavy and covers a good deal of musical instruments), air freight becomes progressively dearer.
4. When you do use a freight agent, choose one which specializes in a given part of the world. All freight agents will take freight for any part of the world, but if one which specializes for instance in USA traffic handles something for say Japan, he will merely take the parcel round the corner to the Japanese specialist and charge you or your customer a commission on this process. Sometimes I've discovered that freight is handled three or four times before it even leaves the County, accruing charges every time.
5. Spare no expense in packing. Use plywood or timber crates wherever possible and of course charge the customer accordingly. Similarly, tell the freight agent to insure the consignment and most important of all, make sure that all charges are sent forward with the consignment. You are therefore not liable for any bill which the agent might think fit to present to you and, because you are not involved there can be no repercussion for late, damaged, or even non-delivered instruments. Similarly, don't get involved in duties at the other end - it's not your business.



Very often a customer asks you for the price of a given instrument F.O.B. or C.I.F. - don't give it. Simply quote the net price of the instrument ex works plus packing. We in fact charge £5 extra for documentation and delivery to the shipper.

6. For freighting inland, we use Roadline (formerly SRS). Many of the other hauliers are marginally dearer and certainly a lot pleasanter to deal with than Roadline, but Roadline, probably because of their size, are infinitely quicker. Also, our experience with claims for damage and loss is good. Don't forget, however, that their liability for an uninsured parcel is only £500 a ton. This sounds a lot until you start claiming for damage to a lute which weighs perhaps only 100th part of a ton in its case and with packing.

FoMRHI Com. 44b continued from page 52

116.88.1 Baines's distinction between Praetorius's Violone and his Gross Contra-Bas-Geig is misinterpreted, making the violone 8 feet tall. The correct choice is illustrated on 88.4.

117.89.1 According to Praetorius's and Talbot's data, the surviving viols called today 'lyra viols' would then have been called 'tenor viols' (see Comm 37)

118.89.2 On the viola bastarda, see Comm. 37. p. 31 for critique.

119.90.1 By 1500 there were two typical Renaissance fiddles according to Tinctoris: one with 3 simple (single) strings and the other with 5 not-necessarily simple strings. (see Appendix of Comm 36) The 3-stringed one directly relates to the violin.

120.90.4 In the 16th century, the treble violino was probably quite small and the tuning g' d' a' is more appropriate, instead of the lowest three strings of the later violin.

121.91.1 The above small instrument could explain the mentioned parts for violino which seems to require a viola.

122.91.2 The B-flat to g tuning for the bass violin is specified by Playford and I know of no evidence showing that it wasn't used well into the 18th century.

123.91.3 Morley's 'Consort Lessons' does not mention a violin alternative to the treble viol.

124.91.4 The "less elevated rebec" was an Elizabethan phenomenon. Tinctoris's rebec was elevated indeed.



As stated in Bulletin 5, a bent-back pegbox can certainly make it easier to reach the pegs of larger lutes for tuning. It also helps balance by bringing the centre of gravity of the pegbox closer to the support holding the body, thus reducing the twist that the support needs to counteract. Some people believe that it makes the neck-pegbox join more secure under the force of the strings, but though we don't agree with this from the kinematics of the joint structure, believing it could be a motivation for constructing it that way which is a valid historical possibility. There may well be other reasons which are possibilities.

What we presented in Communication 40 was a preference stated in the 16th century for taking up less space while playing. This is the only early data we know of which supports any one reason and therefore other reasons are necessarily more conjectural. We never claimed that this ecological reason was the only one, or even the primary one though it may well have been so.

Taking up less room can be useful not only from the warmth point of view. It allows people to get closer to hear the music in unfavourable acoustic circumstances. It also allows the player to wend his way through a crowd with less probability of a damaging collision. These factors were more relevant to common performing conditions in the early history of the lute than they are today.

The p'i p'a and the European lute presumably derived from the early lutes of the near east. Modern people from that region have the custom of keeping their bodies much closer to one another during social intercourse than we do. Such types of social customs are most durable, and it is likely that this was the case in ancient times, this providing a motivation for taking up less room at the crucial time when the bent-back pegbox design was established. As the lute spread to other cultures, tradition was no doubt an important factor in keeping the pegbox bent back.

Though tradition has a momentum of its own, it has to contend with the creative urges and desire for variety that people have always had. As we well know in modern times, traditions lose their force and die very readily when they stop performing any contemporary function. The contemporary functions need not be the same as those which started the tradition.

In the case of bent-back pegboxes the function of taking up less space may well have been the same in Renaissance Europe as in the ancient near east, with somewhat different detailed motivations involved. In saying this we of course accept that other functions have most probably been involved throughout the history of the lute, but we have one datum from the 16th century to support this one. We should be thankful for any relevant data we can get and not take the simplistic approach that if a datum is not definitive it is worthless. We hope to have shown here that it is worth serious consideration and may have been of primary importance.



DETAILED COMMENTS ON "INSTRUMENTS OF THE MIDDLE AGES AND  
RENAISSANCE" BY DAVID MUNROW : PART II

Eph Segerman

46.72.1 The consort of Morley's 'Consort Lessons' was not called a 'broken consort' in his time and it is unlikely that this particular combination of six instruments was ever called by that name.

47.72.2. Reported lists of instruments used in entertainments do not necessarily imply that they played together in consort.

48.72.2 Hoby's translation of Castiglione's 'viola' into 'lute' is quite justified in that it most probably was the viola da mano (tuned and played like a lute and written for by Francesco da Milano) being referred to. Strunk's translation of instrumenti di tasti as 'keyboard instruments' ignores the common 16th century meaning of tasti as frets (eg. Lanfranco's 'Violette da arco-senza tasti' being rebec or violin and 'Violini da tasti & da Arco' being viols)

49.73.1. There is no evidence for 'soft tempered steel' as we know it today. The word 'steel' meant hardened iron. This was usually by mechanical and thermal treatment. Steel as we know it today involves hardening by chemical additions. A thin skin of carbon steel was possible by case hardening up to the middle of the 16th century. Then case-hardening techniques improved and deeper penetration was made possible. It was used for armaments and the processes were kept secret. All carbon-steel strings were available from about 1575 to about 1630, and then again not till the 18th century.

50.73.1 The evidence on the 4-course English cittern before the middle of the 17th century points to 9 not 8 strings (Praetorius, Robinson, Eglantine table).

51.73.1. Twisted wire bass strings were used on larger instruments than the small English cittern.

52.73.1. In the 16th century the relative tuning of the first three courses of the cittern and guitar were just as invariable as the first 5 of the lute. The fourth course of the others varied no more than the 6th of the lute (a tone). When citterns had more than four courses, the added ones were more variable. There is more evidence of lutanists retuning within the same repertoire than citternists.

53.73.3 The Praetorius quote does not indicate that players of tablature instruments "read fluently from staff notation". When discussing transposition Praetorius said "the bass... must be transposed when it is put into tablature or score for players of the organ the lute and any other foundation instruments." (translation by N. Meeus). Neither does Praetorius say specifically that they improvised the ornamentation.

54.74.1 Getting chromatic notes on the harp by stopping the string in mid-air with the finger or nail is a possibility not mentioned.



- 55.74.1 The use of the word 'Gothic' to describe the ordinary Renaissance harp is, I think, a modern folk invention.
- 56.74.2 Praetorius's Irish harp tuning is not improbable. Piccinini had spare chromatics at the end of a diatonic octave of basses on the chitarrone and the *arciliuto*.
- 57.77.1 Lower pitch standards were common and so G-lutes and A-lutes were often tuned rather lower than these pitches at modern (or Praetorius's Cammerthon) standard.
- 58.77.2 & 3 The Wendelio Venere lute illustration is unfortunate since the neck width, peg design, backless pegbox design and frets on the soundboard are obviously modern. The original back is hardly visible. The other illustrated lute is obviously an 18th century conversion so the c.1600 date is misleading.
- 59.77.4 Surely, by 1630 ten courses were common.
- 60.78.1 There is no evidence of preeminence of the keyboard in ensemble music before the end of the 17th century. Early in the 17th century the lute's supreme position was eclipsed by the viol in England and the violin elsewhere but it survived healthily as a solo and continuo instrument till well into the 18th century.
- 61.78.1 There is no evidence for the chitarrone being larger than the theorbo.
- 62.78.2 Galilei did not mention the theorbo.
- 63.78.3 The illustration is not of a theorbo but of an *arciliuto*, as Mersenne wrote in his errata.
- 64.78.4 The Mary Sidney portrait is of Lady Wroth, c.1620.  
79.1
- 65.79.1 & 2 In the theorbo both pegboxes are in line with the neck. This is true **also** with all language combinations with 'lute' in the name. The combination-name instruments tend to be smaller than proper theorbos and they were often just called lutes and occasionally just called theorbo (Mace). These instruments should not be confused with the instruments with one bent-back pegbox with 12 courses which were called French lute (Mace) or English two-headed lute (Talbot) or also just lute.
- 66.79.2 Archlutes were smaller than theorbos and did not have the first course (and usually the second course) tuned down an octave as the theorbo had. As mentioned in 78.1 the names theorbo and chitarrone were interchangeable. So the names archlute and chitarrone do not refer to the same instrument. I strongly object to the promulgation of modern usage of names when this knowingly conflicts with early usage.
- 67.79.3 The late 16th century surviving chitarrones are most probably 17th century conversions of Renaissance lutes.



- 68.79.3 The swan-head second pegbox does not "avoid inordinate length".
- 69.79.3 Piccinini said that metal strings were used mainly in Bologna. Gut was more generally used. There is no evidence supporting mixing string types on the same instrument.
- 70.79.3 The name Mandora associated with a small lute-like instrument does not go back before 1576.
- 71.79.4 According to Talbot the earlier Italian Colascione was tuned with a 5th if there were 2 strings, and an octave below and a fifth above it with 3 strings. His measured instrument had a normal lute body with a long neck (97½ cm. string length) tuned like a mandora or bass guitar. Pohlmann lists many 18th century compositions for this instrument.
- 72.80.1 The cittern was not in higher esteem than the lute anywhere during the Renaissance.
- 73.80.2 Robust construction is not a characteristic of the two surviving orpharions.
- 74.80.2 I interpret the Dekker quote as an insult to the men involved calling them fools (as other theatrical quotes imply) rather than an insult to the woman involved.
- 75.80.3 The lute and the harp were also regarded as descendent from the ancient lyre.
- 76.80.3 *of the Lanfranco tuning given to that of*  
The relationship to the English cittern (ie. the relative tuning of the first 4 courses) needs to be stated.
- 77.80.3 I know of no music written in 1602 or any other time for the hexachord-tuned 6-course cittern. This is a pity since it is clear that this was the standard 6-course Italian tuning. Besides the mentions in Lanfranco, Praetorius and Mersenne (shown in 80.4). Virchi mentioned how his tuning was new and showed how it was related to this standard.
- 78.80.4 The illustrated cittern does not look like any English cittern I've seen illustrated. The peg, pegbox head, fingerboard and rose design are obviously modern. The size is appropriate for the mid 17th century English cittern (but it was played with fingers, not a plectrum) and is too big for the repertoire of Holbourne's time.
- 79.81.1 It should be stated that in spite of the quality of Virchi's music it is not part of a continuing tradition, his tuning not being used by anyone else as far as we know. This might be related to the enormous hand stretches required (his hands may have been unusually large).
- 80.81.2 The relationship between the c.1600 English cittern music and the instrument it was played on should have been discussed.
- 81.82.1 Was the ceterone played with fingers or with a plectrum?



82.82.1 The lute playing broken music in a Morley-type consort also performs the same monophonic role as it did in medieval times. The baroque mandora was often tuned lute or guitar fashion and was played in the same monophonic way as its medieval gittern ancestor.

83.82.3 A bandora with a more authentic pegbox would have been worth seeking out for the photo.

84.82.4 Barley (1597) clearly indicated unison tuning in the 5th and 6th courses of the bandora. The tuning in octaves is given by Talbot a century later. Clearly the Barley tuning is more relevant to the c. 1600 repertoire. The issue is only unsettled because the sound of unison basses isn't penetrating enough on the instruments made by the time the book was written when being played in modern consorts. The problem is: 1. poor instrument construction; 2. unauthentic playing styles of the other instruments and, 3. modern aesthetics of the musicians, and not the strings (if purchased from NRI who are the only producers of authentic bandora twisted bass strings). *(Pardon the advert - I just couldn't resist)*

85.82.4 Gill's statement that the 16th century bandurria is flat-backed is wrong. When Munrow follows Marcuse on 85.2 he gets it right.

86.83.1 "The sturdier flat-backed construction could withstand the tension of wire strings" is nonsense. The wire-string tension in the orpharion was, if anything less than the gut of lutes since the bridge glueing area per string was about the same as that of lutes but the bridge seems to have been higher. (see Comm 16).

87.83.2 The suggestion that the "lute and orpharion make particularly effective partners in the extensive lute duet repertoire" is not supported by any early evidence I know of. The most common lute was the mean lute and there is some evidence that it was tuned at a pitch standard a tone lower than the orpharion (DA & ES 1975 Lute Soc. J. XVII 38, 39). The rarer duets with a tone difference in tuning could be played with this combination or the equal tuning duets could have been played between the orpharion and the rarer treble lute.

88.83.3 The "Pandore en lute" is illustrated in Diderot's Encyclopedie in the middle of the 18th century and this is almost 2 centuries after the bandura was invented.

89.83.3 Praetorius's printing error interchanging the Penoreon and Orpharion in the labelling of the drawing is repeated in the Legend to the illustration.

X 90.83.4 "The so called 'bandora' by Wendelin Tieffenbrucker corresponds to the various surviving descriptions of the poliphant" is a distortion of Gill's statement that "it is a rather elementary instrument of the polyphant type". The Tieffenbrucker instrument is probably either Piccinini's invention called the 'pandora', as described in 1623 by himself and in 1628 by Guistiniani (GSJ V (1952)49) or Piccinini's other invention likened to 'Apollo's lyre' by Guistiniani.

91.83.4 I prefer the arch mandora to the arch orpharian as a speculation for the identity of the stump.



92.84.1 The statement that the vihuela's "use was restricted entirely to Spain and to a certain extent Southern Italy, and to a relatively short period of time" only relates to Spanish dominions and published music. Back in 1487 Tinctoris mentioned a French term for the plucked viola and that in Italy and Spain it was more used than bowed violas; it seems to have been used finger style in the 15th century to accompany plectrum-using lute virtuosi.

93.84.2 Bermudo said that the guitar was invented by Mercury and it was augmented into the vihuela by Orpheus. Also all of the evidence indicates that the vihuela had all strings doubled and in unisons.

94.84.4 The vihuela's first course was tuned to the highest safe pitch and was clearly referred to as double by Milan. Bermudo strongly implied that the vihuela had unison stringing. There is no evidence for a single treble course or octave bass stringing. (See Comm 30).

95.85.1 Playford's 1652 book is for a gittern with the same body as a cittern. A version of this type of gittern with a bell-cittern body is described by Talbot. These both were called guitars because they had guitar tuning.

96.85.1 Praetorius was just as reliable on the plucked as the other instruments. The word 'quintern' had been used for 'guitar' in Germany for centuries before him. The confusion is by modern writers who have not appreciated that the guitar was universally lute shaped before well into the 16th century and this shape has been an acceptable alternative to the viola (vihuela) shape ever since ( eg. Mace p 237 " . . . . , or the Guittar, (a Bit of the Old Lute) . . . . " ). Praetorius mentioned that the quinterna had 4 or 5 courses, but illustrated a 6-course Italian viola da mano, an instrument used in the 15th and 16th centuries, but eclipsed by and merged with the Spanish guitar just before Praetorius's time. The only thing wrong with his depicting a converted viola as a guitar is that he inadvertently let the number of strings equal the number of pegs (the arrangement of pegs on the pegbox implies that there is a missing 12th ).

Marcuse was misread when it was claimed in the book that the 'quintern' was also used for the cittern. The confusion with the lute is understandable, since, as Tinctoris said, the distinction between the gittern and the lute was only one of size.

97.85.1 Tyler's assumption that some vihuelas as well as guitars had vaulted backs is repeated. There is no evidence for this and it is rendered unlikely by considering that the vihuela did not have the round-backed history that the guitar has.

98.85.2 The 'Chitarrino' is also a name for the 15th century round-backed guitar.

99.85.3 There is no ambiguity about the name 'mandora' since it was a later name for a small lute-shaped instrument. The fact that some mandoras retained their historical guitar-tuning is no surprise.

X 100.85. 3 & 4 The table distinguishing between the viol and violin c. 1600 is overburdened with unnecessary distinctions, half of which are violated by the Fritschberg illustration above the table. A comprehensive survey of the surviving instruments, illustrations and writings about them, from that period has not yet been made. Nevertheless it is reasonably clear that distinction 2 (tuning) is the crucially significant difference. Distinction 1 (number of strings), 4 (frets) 5 (back and shoulders shape) and 9 (soundhole shape) are usually valid but with



many notable exceptions. Distinction 6 (side depth) and 10 (pegbox decoration) are often true but cannot seriously be used as distinguishing factors. Distinctions 3 (tailpiece length), 7 (purfling) and 9 (reinforcing bars) are not generally valid. A crucial distinction not mentioned in the book but used by early writers (eg. Cellier in 1535 reported by *Dart* in *Galpin Society Journal* X (1957) 88) is that for corresponding positions in the size hierarchy, viols are bigger. We must beware of being more concerned about distinction than the original players (eg. Talbot as late as c.1590 stated that the bass violin is the least large size of the bass viols).

101.95.4 The viol seems to have appeared in Spain in the late 15th century. The violin seems to have smoothly evolved from the medieval 3-stringed fiddle so its beginning is purely a matter of definition (and further research).

102.86.1 The viol technique section unfortunately relates more to modern practices than to early sources and I know of no evidence for a tradition of treble viols being played between the knees before the mid-17th century. The Veronese illustration on p.86.3 shows it held against the shoulder. If we go by the 'da gamba' 'da braccio' names then we should hold bass violins across the chest or over the shoulder. Descriptions of the violin family have usually started from the treble and of the viol family from the bass, usually getting less information as they go on.

The bass viol player in the upper left corner of the cover picture used an overhand bow grip. Though an underhand hold was more usual there are almost as many different grips described in the sources as there were describers. Nevertheless, using the fingers for controlling the tension of the horsehair is only mentioned before the *baroque* by Ganassi as an expedient when playing simple line music using a loose bow built for playing chords. In some grips such as that of Robinson, the fingers don't come near the hair.

103.86.1 The lute-like position for holding the viol was not transitional but rather a minority practice extending well into the baroque. The implication that bowing in this position is uncomfortable is an ignorant speculation.

104.86.2 The shape of the viol wasn't standardized in England and France (eg. see the French viols in 1630 illustration on p87) until the middle of the 17th century, and never quite became standardized in Germany (eg. see Mayer's 'Museum Musicum' of 1732).

105.86.3 The acceptance of the structural data and implied chordal style of play on early viols provided by the illustrations of Virdung and Agricola is refreshing. A small curvature on the bridge like the lyrone is quite possible.

106.86.3 Agricola's second edition in 1545 indicates only 5 strings for the bass and 4 for the others.

107.86.4 The given Ganassi tunings were not standard at the time but happened later to become the English standard.



108.86.4 It is a pity that the fiction of the alto viol in C (tuned a tone lower than the treble) is brought up. There is absolutely no evidence for it in England. Mersenne mentioned the occasional use of such a viol, calling it the contra-tenor. When it was used, the usual middle-sized instrument, called the alto, was tuned a fourth lower (Mersenne mentioned no tenor). The usual arrangement was when the alto and contratenor were both tuned a 4th below the treble. The surviving "large treble viols" were ordinary trebles played at the low pitch standards prevalent in England and France.

109.87.1 Ganassi's history of the viol (violone), blurring the distinction between violone and lirene is a clue to the early history of these instruments, and harks back to Virdung's Gross Geige (86.3).

110.87.2 The term 'consort of viols' does not exist in any early source I've seen - and I've looked hard for it.

111.87.2 Praetorius made no slip when he said that the English tuned their viols 'a fourth or fifth lower'. He meant that the tuning was that much lower than what they said it was (nominal tuning). Praetorius gave the nominal tunings he thought the English assumed for their viols. This clearly ends up confirming approximate agreement with the tuning which he used, as Praetorius stated..

112.87.2 Praetorius's treble viol was tuned from A to a', not G to g'.

113.87.2 If Mace's chest of viols were the same size as those Talbot mentioned, then they would be approximately the same size as Praetorius's (see Comm 37) and would sound fine.

114.87.3 & 4 A comparison of the two illustrations in detail shows how modern the "modern viol consort" is.

114.87.4 On 87.1, following Hayes, Ganassi's use of the word 'Violone' is equated to 'viol' (all sizes). Here, following Francis Baine's error, it is equated to 'bass viol'.

115.87.4 The name 'violone' is not ambiguous. In the 16th century it meant all viols and implied that they were bigger than other viola-shaped bowed instruments. In the 17th century it began exclusively to refer to the contrabass member of the viol family with over a meter string length. The contrabass member of the violin family (Praetorius's unillustrated Gross Quint-Bass) tuned in fifths was very difficult to play so the violone often performed that role as well. It was tuned either D' to d (Praetorius) or G' to g (Talbot and probably Gibbons), keeping the same size throughout. At the higher pitch the range included that of the bass violin (usually tuned B-flat to g) but, being bigger, gave a stronger bass sound. When overspun strings were invented in the 1660's the bass violin adopted them to give a stronger bass. Bass parts were requiring more agile playing and the smaller bass violin could cope more satisfactorily. Since the bass violin then played violone parts it came to be called 'little violone' ('violoncello' or 'violoncino' in Italian). I have not seen convincing evidence as yet showing that the 'cello was called 'violone'. In the 18th century the name 'double bass' gradually replaced 'violone'. As the upper register was not used, strings were shed (as well as frets). The distinction modern writers try to make between the double bass and violone escapes me.

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