FELLOWSHIP OF MAKERS AND RESTORERS OF HISTORICAL INSTRUMENTS

BULLETIN AND COMMUNICATIONS. JULY 1977

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Book News. Continued from page 13

Bele Buche e Bele Parleure: a guide to the pronunciation of medieval and Renaissance French for singers and others by Jeanine Alton and Brian Jeffery (Tecla Editions, Preacher's Court, Charthouse, London EC1M 6AS), 1976.

This slim volume (79 pages) contains detailed notes on the pronunciation of French from 1100 to 1600, and also medieval Provençal, Picard and Norman. The beginner will take some time to get used to using the International Phonetic symbols, and also finding his way to the appropriate sections, but will eventually obtain clear explanations to most points of difficulty. There is also a chart summarising the development of French vowels, and the text of 12 passages of which specimen pronunciations are recorded on the accompanying cassette (6 of the passages sung, the others just spoken). We have not yet been able to hear the cassette, but would imagine that it is indispensable to anyone who lacks patience or linguistic ability.

The singer will find this a useful and rewarding book. My only grumbles are: (1) the singer is less likely to come across songs in Norman than in Anglo-Saxon or the French of the Tudor court· (2) two of the texts (the Chanson de Roland and the Jeu de Saint Nicolas) are unlikely to be performed by singers· (3) no phonetic transcriptions of the passages are given· (4) the bibliography omits some recent and eminently readable books on French, notably: J. Fox & R. Wood, A Concise History of the French Language, London 1974; E. Einhorn, Old French: Concise Handbook, Cambridge U.P., 1974

Lawrence Wright

FELLOWSHIP of MAKERS and RESTORERS of HISTORICAL INSTRUMENTS

Bulletin no.8 June, 1977

First I must apologise for the bad printing of some of the last issue. It was not, for once, due to my typing but to poor quality reduction masters from which the copies were printed. We hope to have overcome this, though as I write I am not certain whether Djilda has managed to find a xerox firm that will give a better master or whether, as our printers have recommended, we shall be trying a rather more expensive but I hope just manageable process involving bromide prints. I have now got my own electric typewriter, which means that what I write is evenly typed without weak letters, and, again at the printer's recommendation, I am using a carbon film ribbon which gives a much sharper image. So we shall see what we shall see - if it's any comfort, we do at least try to improve.

ACCOUNTS & FINANCIAL REPORT: The books have at last been audited and they and the accounts approved. The delay is my fault but I was not willing to be parted from the account book while renewals were coming in thick and fast, and they were late because we had not used a separate reminder note. If the following is inadequate, please say so and I will do them in full for the next issue, but I hope it may suffice.

Income:	1975 subscriptions	£215.65	(of which £6 carries forward to 1977)
	1976 --	£560.04	-- -- £24 -- --- --
	total:	£775.69	£30

The £30 carried forward arose because the initial European subscription was £4 until we discovered that we could send material much more cheaply as printed matter reduced rate by surface mail, and none of the European subscribers have objected to the slight delay this involves; we were therefore able to reduce their subscription to £2 and count their initial subscription as for two years.

Expenditure:	Stationery etc.	Postage	Printing *	Total
1975	£16.32	9.05½		£ 25.37½
1976	35.85	184.92½	343.40	564.17½
	52.17	193.98	343.40	£589.55

* Unfortunately this is not an exact figure; it includes some postage because that was paid on the same bill in the early stages, and it also includes the cost, as well as the printing, of the envelopes in which the issues go out.

Report: At the end of 1975 we had 89 members and at the end of 1976 we had 275.

Some of the surplus of income over expenditure can be accounted for by the fact that the initial printing and circulation of Bull/Comm 1, which was sent to a great many potential members on a list drawn up by NRI and myself, was paid for by NRI and has not yet been repaid by FoMRHI. Some also was the result of over-estimating the cost of postage to Zone B (the United States, Canada; etc) to the extent that we reduced the overseas subscription for 1977 to £4 and asked only £3 for renewals. It must therefore be remembered that £2 of every overseas subscription for 1975/6 is being carried forward into 1977 and this is over and above the £30 shown above, which is only the European over-payment. Some surplus also resulted because we had estimated printing costs on a Bull/Comm the size of no.3, but except for that issue we did not receive the amount of material we had expected.

(Report continued)

We have used this surplus to reprint our back issues, since we find that new members almost invariably want a full set. We are still hoping to issue Special Communications and we intend to use any surviving surplus to pay for the first of these; the results of its sale will then pay for the next, and so on.

The unit cost of issues has varied according to their size and to the rate of inflation, as will be seen from the reprint prices for nos.2 & 3.

Bull/Comm.1 Oct.75 - 6p. for the 1976 reprint
2 Jan.76 - 12p. (the 1977 reprint cost 20½p.)
3 Apr.76 - 26p. (- — — — 41p.)
4 Jul.76 - 17p.
5 Oct.76 - 24p.

If you add that up, you don't seem to get much for your money, but you must remember that each issue has to go in an envelope, which has to be posted (and unit postage is almost always more than unit printing, which is a depressing thought). Many of you write letters, and answers have to be posted back to you (this is not a complaint - please go on doing so). The only expense that Djilda and I charge FoMRHI is our postage bills; I never remember to start the stop-watch so can't claim phone calls, and I use my own envelopes for FoMRHI correspondence and take a FoMRHI envelope in return when I need a larger one.

I must ask you to take note of the 1977 reprint costs. These were done early in 1977, and they would cost more still if they were done now, and prices are still rising (and postage has just gone up). It does not look as though we shall be able to hold the subscription at the present figure for next year; we are still doing sums, and some of it will depend on whether we continue to xerox-reduce or whether we switch to bromide, but I fear that we shall have to ask for an increase for 1978.

NEW & RESUBSCRIBING FELLOWS: Edmund Bowles, John Cousen, Martin Edmunds, Jacques Leguy, Christopher Monk, Laurence Picken. All appear in the Supplement to the 1977 List of Members, herewith, so there's no need to list their interests here.

EXCHANGE MEMBER: The Musikinstrumenten Museum der Karl-Marx-Universität in Leipzig have offered to exchange their Schriftenreihe for our Bull/Comms Theirs will be housed here if anyone wants to see them. Our contact with the Museum is through Dr.Hubert Henkel.

LOST MEMBERS: Brian Butler has been found; he was at the same address all the time, so why his Post Office returned his Bull/Comm 5 marked 'undeliverable' neither he nor I know.

FoMRHI SEMINAR: Bob Marvin wrote to me and said that he was thinking of coming over round Christmas time, and what about a 16th century viol and recorder seminar. I've only had time to get on to a few people so far, but we have booked the Early Music Centre in Holland Park for December 28th, 29th and 30th. Bernard Thomas and Anthony Rooley will certainly be involved, along with a number of others, and we hope that anybody interested in playing, and possibly singing, 16th and probably late 15th century music on any wind and string instruments of that period will come. There will be instruments available for those who want to play them but haven't their own of the right period, and the only requirement is the interest and the ability, or willingness, to

(FoMRHI Seminar continued)

read off contemporary clefs and to transpose. There should be fair amount of discussion of techniques and styles and tunings etc as well as a lot of playing in the three days in what is normally a pretty dead period. I don't know yet what costs will be; my inclination is to divide the total between the participants. The Early Music Centre will cost us £60 for three days (you pay for your own lunch) and I suppose we ought to allow something for postage and so on, so at the outside if 10 people come it will cost £8 a head; if 20 come it will be £4 a head, and so on. If other costs appear, that will affect the issue, so all I'm asking at the moment is, are you interested in coming? If the answer is yes, please return the enclosed slip, filling as much of the detail as you can, and I'll let you know more as soon as I can.

It will help to reduce costs if London members can offer hospitality to others, whether it's beds or sleeping-bag space. If you think you can, please give an indication on the form; since it's only a preliminary form it doesn't commit you if you later find that you've got a house full of in-laws for Christmas.

It will also help if you can provide extra instruments, either for loan or for loan with a prospect of sale. I've asked Bob to bring over a box full of recorders, which he will do up to whatever limit he thinks the Customs will allow. Tony will have a set of renaissance viols by then and I hope that some of our maker members will be able and willing to bring instruments that can be played during the three days.

If we decide on any definite music and editions, I'll include a list with the further details, so that you can bring copies if you have them, and will also talk with Brian Jordan, whose shop is next door to the Early Music Centre, and who is now a FoMRHI member.

I haven't mentioned any other names because I've not had the time yet to talk to them, but I hope that many others will help, lending instruments, leading discussions, teaching and so on. I think that everybody who was at the previous Seminars learnt from them, and there is so much that we don't know that there really isn't a lot of difference between those who come to learn and those who come to teach; we all learn in the end.

EARLY MUSIC EXHIBITION: Just a reminder of this, at the New Horticultural Hall, Westminster (just off Vincent Square), September 15th, 16th and 17th. I said last time that I would have a stall for me and for FoMRHI and I hope to see many of you there.

CONFERENCE on the FUTURE of EARLY MUSIC in BRITAIN: This Conference at the Festival Hall last month, which was inspired by Tony Hooley and excellently organised by Francsca McManus, was extremely succesful so far as the participants were concerned. It's too early to say how successful it will prove to have been in its real purpose, which was to increase the financial support for early music, but it was a wonderful occasion for us all to meet all our friends and colleagues, and one thing it certainly achieved was to show us all that we had far more in common than we had dividing us. Whatever rivalries and so on that there may be are a lot less important than the things that we share. I think that we should all be very grateful to Tony for this occasion.

CRAFTS COUNCIL: They have at last sent me information, which you will find on page 9.

EARLY MUSIC NEWS: Djilda and I decided some time ago that we could not cope with leaflets and so on to insert into our mailings. We're making an exception for one herewith because it seems to be intending to cover all the aspects of Early Music that FoMRHI doesn't cover; it looks as

though there will be the minimum of overlap but that anyone who is interested in FoMRHI is likely to be interested in Early Music News.

FIBREGLASS INSTRUMENTS: Trevor Downing writes that he is trying to develop early woodwind instruments in fibreglass so that school craft teachers can supply the music department with cheap instruments that the children can make themselves. He is starting on piccolo, 19th century musettes (the amateur's small oboe, not the bagpipe) and chalumeaux and hopes to go on to shawms, cornetts and larger instruments. He is not intending to produce instruments of commercial quality, but reasonable school instruments. Anyone interested should get in touch with him. He is experienced in school crafts departments and offers help in that area also.
My only fear with glass fibre is that it can be uncomfortable on the lips, and one must be very careful that there is no risk of inhaling any loose fibres, or dust.

STRADIVARIUS GUITAR: Charles Ford has had a lot of enquiries since the note in the Bulletin that he was preparing plans of this instrument in the Ashmolean. He apologises for delay, but the fair copy of the plan is not yet ready. When it is, it will be in the NRI Design Service list, so further enquiries to them.

BRUNSWICK FOOT: Jörn Steinberg has sent me two versions:

Schlag nach!, Leipzig, 1939: 1 Rute: 16 Fuss; 1 Rute: 4.566m.

Meyers Grosses Konversationslexikon, vol.XIII, Leipzig & Wien, 1907: 1 Rute: 16 Fuss; 1 Rute: 456.580 cm

Thus the Fuss is a) 28.5375 cm or b) 28.53625 cm. The latter figure agrees with Bessaraboff. Unfortunately, neither encyclopaedia cites a source for these figures.

BENT-BACK PEG-BOXES: Philip McCrone suggests that the reason for these is that a turn of nearly 90° acts as a partial belay and approximately halves the turning moment (pull) on the peg-box, which, with anything up to 13 courses, most of them doubled, is a consideration not to be ignored.

AIR WOOD: Frederick Rubin writes that Lyn Elder has told him that it is hare wood or sycamore. Ephraim Segerman and Djilda Abbott have cited a reference in Bessaraboff (fn.486): Canon Galpin kindly supplied the following information on air wood: "It is the handsome wood of the Oriental Plane (Platanus orientalis L.), a native of South Europe and the East. The wood was cut in thin strips and dried in the open air for cabinet work". According to Alan Mitchell's Guide to Trees of Britain & Northern Europe, a photo copy of which they also sent, it is native to Asia Minor, S.E.Europe and India; he gives a date of 1550, which I presume is that of introduction into this country, and says that it is infrequent in southern England and rare north of the Midlands. Apparently the London Plane is a hybrid between this and the American Plane, P.occidentalis. If you think it worth trying, it might be worth asking the Borough Council for a few branches next time they are pruning.

LOCATION OF BARS UNDER THE BELLY: Tim Hobrough says he uses a tuning fork with a ball end, which sounds different when placed on top of a brace than it does when placed on open soundboard. This is also useful for detecting loose braces (or bars) if you know where they should be. It takes a lot of patient listening.

TREE-FELLING: Philip McCrone suggests that for smaller sizes of timber, a chain saw is an unnecessary expense. An axe for toeing and a Sandvik type bow saw are all that are needed.

ACCURACY OF MEASUREMENT: Philip McCrone writes: "It seems to me that many people are getting sidetracked by minutiae in their search for this chimera called 'Authenticity'. There must of course be certain guide lines, the case of a careful copy of an Oboe which is adapted to take a modern or modern style reed is of course ridiculous, but to talk of measuring woodwind bores to an accuracy of o.001mm. when the original maker's reamers must have varied more than this by constant use is to get mesmerized by microns and mindless of the music. To take a far from unlikely hypothesis, which is more authentic, a very accurate copy of indifferent tone or a less accurate copy which more nearly matches an original."

Bob Marvin writes: "'Exact copies' and accuracy of reproduction. Numbers seem senseless, since different places need different tolerances. The problem seems pretty insoluble, depending on personal judgements of people comparing original and copy. 'False' standards might just confuse and obfuscate the issue."

Futher comments will be welcome, long or short.

REAMING: Bob also comments: "Uneven, uncontrolled torques in hand reaming may make some inaccuracy. Machine reaming is usually a little neater and controllable."

TUNING & PITCH: He also writes: "Latest on Pythagorean tuning: f to b [by which I take it he means b natural] gives a "D" difference tone, a nice harmony to both other notes. Found while thinking about double flutes and what they'd play, from them to Gafori's Falsus Contrapunctus with all its small intervals in duo.

"Standard pitch. While renaissance music doesn't seem to show much bias towards any specific pitch, some inst ruments, on the borderline of success, are sensitive to pitch. To change pitch just a little means then a bigger change in instrument design (tenor recorders a prime example, needing a key at a' 440).

"Praetorius pitch: Rhodes and Thomas' article on this isn't so good. They base a' 425 on three things: 1) P's scale of little ½ foot tuning pipes, 2) scaled instruments in Orches. 3) plate in O. of big organ pipes. Well, I don't know enough about organ pipes to comment on 1) except that I suspect such short pipes aren't very good standards. For 2) the Plockflöten in museums at about P's measurements are between a' 450 and 460. For 3) that plate has a scale with three half feet between "3" and "4". R & T take the total length and redivide it, ignoring the possibility that the half feet are correct, but misnumbered. All this should at least lend some suspsicion to their conclusions."

I would add to that that I haven't checked back on the Rhodes & Thomas article, but I have looked at Praetorius's plate 37, and all the half feet are the same; i.e. there are 3 of the usual size of half foot between 3 and 4. Which suggests that Bob may have something.

REQUESTS: Philip McCrone has four: Can anyone supply him with makers' drawings of a good treble baroque recorder, preferably a Bressan at A 415?
Can anyone supply him with drawings of a bass viola da gamba, preferably by Barak Norman?
Where can he obtain the plush lining material used in instrument cases?

Would anyone be willing to write a Communication on seasoning wood, especially boxwood? I would second that last request; there must be a number of beginner makers who would be grateful, however elementary such a request may seem to the experienced maker.

OFFERS: Sand Dalton (please note his change of address) will be glad to supply measurements of the following instruments which he made on his recent tour:

1 oboe by Debey (Bate Coll. Oxford)
2 anon oboe (Royal College)
3 anon oboe d'amore (Vienna)
4 Haka tenor oboe (Vienna)
5 Eichentopf oboe d'amore (Leipzig)
6 Denner tenor oboe (Leipzig)
7 Hummel tenor oboe (Basel)
8 R.Wijn tenor oboe (Gemeente)
9 Dotzell oboe d'amore (Munich).

What he would like to do most is exchange measurements with others who have been out in the field on an instrument for instrument basis. Otherwise he will ask a $5.00 charge per instrument to cover his labour and postage.

James Somers says that his wife, if they are not too far off for us, would be willing to type some Communications.

SOURCES: Ivory and Tortoise-Shell: Frederick Rubin has a friend who deals in ivory, who can get tusk at $22.00 per pound, and another friend who is selling real tortoise shell from commercially farmed green sea turtle (i.e.it is legally done, he says) for $5.00 per ounce (an ounce being approximately 28 square inches and a pound 3 square foot). If anyone wants any, write to him. He doesn't intend to take a cut, but if anyone wants some he can put in a bulk order including the small amount he wants for himself.

Purfling: Arthur Young reccomends a firm near Stuttgart, Karl Zeeh, Werkstätte für Holzmosaik, D-7014 KORNWESTHEIM, Karlstrasse 21, West Germany, which not only supplies purfling in any colours ranging roughly from 1mm black and white at 19DM to 3.5mm for 62DM for 100 pieces 80cm long. He also makes "the most beautiful soundhole inlays for guitars that you have ever seen. He has over thirty different patterns for them, all in wood, no plastic, with prices that range from DM 1.90 for the simplest and narrowest up to a width of 24mm with the most complicated pattern I have ever seen at a price of DM 11.30". Arthur sent Djilda a sketch of purfling designs with prices; she might be able to supply photocopies of it, but otherwise write direct to Karl Zeeh.

Tools: Cristobal Boettcher has sent a price list of a tool firm he knows of, covering violin etc maker's tools and woodwind maker's. He says that the quality is excellent and that they will make to special sizes; the list is for standard modern instruments. I don't know how the prices compare with others, but reamers for an oboe cost DM 197 and 223, for example, and a peghole reamer fora lute costs DM 32. He has not given me the name of the firm, so all enquiries to Cristobal. I'll send the list to Djilda.

Tools: Also with Djilda is a terrific catalogue from Lewis Luthier Supplies (who are members of FoMRHI, so say you are if you write to them) with so much information on tools and how to use them that she is reviewing it as a book. See among the Comms'. herewith.

FINALLY: If you think you may come, please send back the slip for the December Seminar - even the roughest indication of numbers is useful to me at this stage.

Deadline for the next issue is 1st October, or give it to me at the Early Music Exhibition.

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

BULLETIN LATE ADDITIONS E.S. and D.M.

HANS FREI LUTE in Warwickshire County Museum. The drawing made by Michael Lowe is now available, price £2.00 at the Museum sales desk or £3.00 by post (presumably more outside Great Britain). The address is County Museum, Market Place, Warwick.

NRI DESIGN SERVICE At last it looks like things are beginning to happen. Members should expect to hear soon about supplies of flame sycamore and of a lending library of plans and photos of original instruments as well as other plans that can be purchased.

DRAWINGS AVAILABLE FROM VICTORIA AND ALBERT MUSEUM:

1. " Queen Elizabeth's Virginals", Late 16th century
2. Single Manual Harpsichord by Jerome of Bologna, Rome 1521
3. Single Manual Harpsichord by Giovanni Baffo, Venice 1574
4. Double Manual Harpsichord by Vaudry, Paris 1681
5. Clavichord by Barthold Fritz, Brunswich, 1751
6. Virginals by Thomas White, London 1642.

These full-size drawings are printed on paper and together with explanatory notes and photographs cost £32.40 a set.

Available soon:

1. Virginals marked Marco Jadra, Italian 1568
2. Double Manual Harpsichord, by Hitchcock, London, c. 1725.

ACCURACY OF MEASUREMENTS ON WIND INSTRUMENTS

Concerning Jeremy's suggestion on Bull. 7, page 4, that woodwind bores could, and therefore should, be measured to the nearest .001 inch: it is the opinion of Prof. Arthur Benade that the smallest unit that makes any acoustical difference on any woodwind instrument (and on the body of a stringed instrument as well) is .01 mm (.004 inch). Incidentally, we wonder whether woodwind researchers (of which we are not) use the fact that wood contracts about twice as much in the tangential than in the radial direction in estimating the original dimensions when measuring an elliptical bore. The estimate of the original circular bore is obviously the maximum diameter plus the difference between the maximum and minimum diameters. This, of course, assumes that the billet the instrument was made from came from far enough from the centre of the tree and that the grain is uniform enough for the concept of radial and tangential direction to be valid.

CRAFTS ADVISORY COMMITTEE

We received their introductory leaflet which begins: "The Crafts Advisory Committe exists to promote Britain's artist craftsmen. Its aim is to help them maintain and improve their standards, sell their work and become better known to the public".

What follows is reproduced in the centre-spread of this issue of FoMRHI. The final page of the leaflet lists the Committee Members and Staff, none of whom are in the musical instruments field, as far as we are aware. We heard at the recent Early Music Conference in London that David Rubio is on a sub-committee. We also understand that there has been more money available for grants and loans than has actually been handed out - so if you think you might be eligible it's well worth a try.

Finally, and again we quote: "PREMISES: The CAC is an independent body with certain administration services provided by the Design Council. The CAC's information services and exhibition staff are housed at 12 Waterloo Place, London SW1Y 4AU. Their gallery, the Waterloo Place Gallery, is also at this address and is open Monday to Saturday from 10 to 5. The CAC's offices are at 11 Waterloo Place. FINANCE: The CAC receives an annual grant from the Department of Education and Science. The current grant for 1976 is £67,000."

We received also the following further information on the INDEX OF CRAFTSMEN, reprinted in full:-

Inclusion in the Crafts Advisory Committee's Index is open to artist craftsmen whose work has been accepted by the Selection Committee.

The Index is housed at the CAC gallery in Waterloo Place and the Index, slide library and reference section - including the Register of Craftsmen - can be consulted 10 - 5 Monday to Saturday. The Register is a non-selective list of craftsmen throughout England and Wales, and everyone applying for the Index is included in this list. Information is also available on craft courses, craft shops and galleries, exhibitions, suppliers of materials and equipment, museums and craft publications.

The aim of the Index is to encourage the commissioning of crafts and to make the work of craftsmen better known to the public. It consists of slides backed up with biographical details of the craftsmen represented. Anyone wishing to buy or commission work, borrow slides or use the Index for reference can view the slides by appointment.

There are over 7,000 slides in the library which is based on the slides of the work of craftsmen in the Index plus a record of degree work and of CAC exhibitions. The slides are available for loan to lecturers and organisations, free of charge, except for postage. Applications for loan may be made by post, or in person, at least ten days before the date required. Catalogues (state categories required) and order forms are available on request.

The Selection Committee is nominated by the British Crafts Centre and is made up as follows:

Chairman	a member of the BCC Council of Management
Craftsmen	drawn from the fields of glass, metal, pottery, textiles, wood
Co-opted members	for areas such as bookbinding, ironwork, leather, engraved and painted glass, musical instruments

Secretary of the CAC and Director of the BCC

Selection meetings are held four times a year at regional centres throughout England and Wales and applications can be accepted up to the seventh day of January, March, June and December.

At the first stage of selection ten 35 mm colour slides of recent work are submitted together with a completed first stage application form. Selcted applicants are then asked to submit not more than five examples of recent work to a subsequent meeting of the Committee for the second stage of the selection procedure. Arrangements can be made for members of the Selection Committee, or their nominees, to view work which is already in situ or too unwieldy to be sent to a meeting.

After acceptance at the second stage, applicants are invited to be included in the Index of Craftsmen, and are entitled to sell their work through the British Crafts Centre's gallery in Earlham Street and their shop in the Victoria & Albert Museum, if they become members of the BCC.

Further information and application forms can be obtained from:

Index Librarian
Crafts Advisory Committee
12 Waterloo Place
London SW1Y 4AU
Tel: 01-839 1917

REPORT ON FoMRHI SEMINAR no. 2
E Segerman

As announced in Bulletin 7, page 12 a seminar on Medieval Instruments was held in Manchester on 4th June. Fewer participants than expected showed up. The proceedings developed with Lawrie Wright and myself as the prime active participants; me mostly posing the questions and Lawrie either had the answers at his fingertips or we looked at a good number of slides and prints to explore the answers together. The focus was on details of citole construction that are not well covered in the literature: The main relevant articles are Remnant, GSJ.XVIII (1965) 104 and Wright, GSJ.XXX (1977).

PEGBOX: Various patterns:

a) fiddle like disk: pegs going in from the front, head on the end
b) gittern-like bent-back sickle shape with an animal head on the end; pegs going in from sides,
c) sickle shaped pegbox sweeping out in front from the neck; head on the end: no pegs observed (perhaps strings go through holes to the back of the pegbox where they go to pegs stuck into the back), or
d) massive combined neck and pegbox with thumb-hole; when strings go to the very end of the pegbox, we occasionally see pegs going into the end surface (ie. peg shafts are parallel to the strings on the fingerboard), and when strings don't go to the very end they dive into holes to meet the pegs that go in from the side.

Pegs are so rarely shown that we were led to speculate that perhaps the pegs were sometimes like those on the harp and that the large plectrum might also be used as a tuning hammer.

FINGERBOARD: Occasionally the fingerboard and soundboard are continuous but more usually there is a fingerboard that extends over the soundboard. The fingerboard has frets on it more often than not. Both single and double lines for frets are common. The frets often extend over the full length of the fingerboard and so cannot be tied on in the way it is done on lutes. The fretting seems to be pentatonic with fairly equal spacing and the doubled frets would be associated with semi-chromatic pitch variation and/or ornamentation.

STRINGS: The usual number of strings is 4. A late 14th century French source (see Comm 14) recommends gut as the material. We know of no source before Tinctoris (1490) mentioning metal and so wonder who were "the old writers [who] tell us [the strings] were of wire" stated by Galpin.

BODY SHAPE: The back is flat with the height of the sides sometimes greater near the neck than at the tail. Most aspects of soundboard shape are carried through by the sides to the back. Occasionally the soundboard shape is a simple oval but it is usually more interesting. Most often there is some protuberance along the shoulders where the curve of the edge from the neck and that from the middle approach each other at an angle. They can meet at a simple point or the point can be capped by a semicircular lump or a trefoil or fleur-de-lys, or the point can be squared off as the curves approach parallel. Any of these shoulder shapes except the last can be repeated on the lower end leaving a waist inbetween, but the lower end is often left as a smooth curve. There is occasionally a single or double lump decoration on the waist. There is often a point in the shape at the tail knob.

TAIL KNOB AND STRING FIXING: At the tail one sees string fixing pins or more usually a fleur-de-lys or round knob. The strings can be tied directly to the knob or tie to a ring (probably made of leather) that goes round the knob, or tie to a tailpiece which attaches to the knob by means of the ring, or the strings can tie to a stud which goes through the knob.

OTHER FACTORS: The bridge is often not evident, probably signifying bridge-tailpiece unified construction. The bridge is usually closer to the tail than on fiddles. There is usually either one central soundhole or 4 soundholes distributed symmetrically about the soundboard. The colouring is the same as fiddles, ie. the total instrument is usually pale, but occasionally it is dark all over and one rarely finds a darker back and sides (this contrasts with psaltries in which there is much more often a dark-light contrast between the sides and/or bridges and the soundboard). It was noticed that harps often shared with citoles the decoration of having a trefoil below and an animal head above (either sticking up free or built into the structure seeming to be consuming another part of the structure).

We were not able to confidently distinguish citoles from plucked violas when the corner decorations were minimal and wondered whether the original players did.

We couldn't just talk about citoles and following are other points worth mentioning that came up:

Lawrie found an illustration of a French plucked viola from the second half of the 15th century which could be an example of the demi-luth that Tinctoris mentioned. It is on fol 151 of Bodlean Douce 134.

Some recent and not-so-recent publications claim that illustrations such as the one in Bodlean MS 264 showing two trumpets being played by one person are unrealistic. Lawrie demonstrated how it could be done with two cornets.

A good time was had by all and the excess food and drink was not wasted.

PoMRHI Book News no.2

Lyndesay Langwill is inviting subscriptions for his 5th Edition. The price will be £10 but, as anyone who has ever used the Index of Wind Instrument Makers knows, a) it is worth every penny, and b) it is essential to be up to date with it. The information in each successive edition is more and more comprehensive and, of course, more and more up to date. There are very few books which are really essential, but this is one of them. If I had a penny for every time I have consulted the 4th edition, I would be able to buy three copies of the 5th, and if I had a penny for every time I've consulted the Index from the first edition on, I could buy a whole library. If you're involved in wind instruments in any way, and you haven't got a Langwill Index, now is your chance; and if you have LGL[4], you're going to need the 5th edition, aren't you. His address is in the List of Members and he will send you a prospectus on request (and would probably be grateful for a stamped, addressed envelope), or just write and say you'd like a copy when it appears. He doesn't want the money yet but will invoice when it's ready.

Jeremy Montagu

Lewis Luthier Supplies Ltd. Catalogue for Musical Instrument Builders, is a catalogue that doesn't stop at selling you the stuff, but gives advice on what to buy, how to use it, or even in some cases how to make do without it. There are detailed descriptions and evaluations of the various items for sale from people who have been using them, and extensive notes on workshop techniques including some on planes, scrapers and wood. The emphasis is modern folksy, especially guitars, so that means wood, tools, varnish and glue for "lutes" (in the Hornbostel and Sachs broader meaning of the wood - see Comm 36). You will actually find real lute ribs listed, and even lute pegs for those who don't object to the modern-Oriental tradition. As any reviewer knows, the parts that he's not thoroughly conversant with seem fantastically good since he's learnt from them, but in his areas of expertise, errors of commission and omission become very evident. For example, in the section on soundboard woods they clearly favour Western Red Cedar above Spruce on all points; in their enthusiasm there are two distortions that I'd like to point out. In eulogising the Western Red Cedar they claim that "the largest percentage of famous classic guitars are made with cedar tops" not mentioning the distinction between Western Red and Spanish Cedar. They claim also that cedar "contracts and expands half as much with changes in humidity"as spruce; the figures from the U.S. Department of Agriculture Wood Handbook give 1.3 times as much on the radial direction and only 1.1 in the tangential direction. Nevertheless this should not put anyone off paying a few $ for 90 pages of top-rate workshop browsing. It costs $3.25 which includes surface postage; for airmail add $1 extra in U.S.A. and Europe; or $2 extra in Asia, Africa, Australia and New Zealand. Write to Lewis Luthier Supplies, 3607 West Broadway, Vancouver, B.C. V6R 2B8, Canada.

Djilda Abbott

The Germanisches Nationalmuseum Nürnberg have a booklet for sale at DM 1.80 which was produced as part of an exhibit of the newly-restored harpsichord dated 1681 by I. B. Giusti of Lucca, showing its conservation and restoration problems and how they have been met. The Museum has already produced a full-sized plan, and this booklet 208 x 147 mm of 12 pages is a popular version for the non-specialist visitor of the restoration report (complete with popular title, "Ein Cembalo des 17. Jahrhunderts klingt wieder"). The cover shows, side-by-side, photographs using light and X-rays while inside are 8 other photographs, a reduction (about 1/12 size) of the plan and a text reproduced from typescript.

One is always worried that museums in 50 years time will regret some of the techniques of restoration currently in use. The part of this restoration likely to draw future criticism is the use of epoxy resins for consolidating wormeaten wood since it is difficult or impossible to reverse if or when better techniques become available.

This booklet shows how museums can inexpensively produce information interesting to the average visitor. Perhaps there is now sufficient demand to make it worthwhile also to produce the more complete and technical reports that would be of great interest to specialists.

John Barnes.

Continued on page 1

FELLOWSHIP of MAKERS and RESTORERS of HISTORICAL INSTRUMENTS

1977 List of Members - 1st Supplement, as at 23rd June 1977.

F in left hand margin denotes Fellow.
* in left hand margin indicates a change of address from the main list.

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William R.Hullfish, Music Department, State University College, Brockport, NY 14420, USA; tel:(716) 395-2319 (ren.winds, hurdy-g.;P,res).
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John Kelsey, Managing Editor, Fine Woodworking, The Taunton Press, P.O.Box 355, Newtown, Connecticut 06470, USA; tel:(203)426-8171.
R.Lawrence, 14 Ryon Close, Andover, Hampshire (lutes, rebec, citterns; M).
F Jacques Leguy, Aux due Cornetti, 49 Avenue du Plessis 49, 92290 Châtenay-Malabry, France; tel:(1) 350.44.99 (ren.ww, double reeds, cornetts, M,R,P,W; acoustics, res, W).
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David Reichenberg, Reichenberg bei Wörndl, Rauchenbichlerstr.14, A-5020 Salzburg, Austria; tel: 787195 (bar.oboe; M,P).
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* Jörn Steinberg, D-2000 Hamburg 53, Blomkamp 130c, West Germany (lute;P).
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* Stephen Taggart, c/o Stamford Music Shop, 11 St.Mary's Hill, Stamford, Lincolnshire (hurdy-g., lute, rebec, small-pipes, concertina;M,C,P).
P.Ian Theakston, 72A Main Street, Burton Joyce, Nottinghamshire; tel: Burton Joyce 3714 (lute; M).
University of Washington Library, Serials Division, Seattle, Washington 98105, USA.
* Shin Watanabe, 12-4 Fukuzumi-cho, Sendai 983, Japan.

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Woods, add: Brian Butler

New categories: Polishes: John Betts Acoustics: Jacques Leguy (W)

Museums, add: Leipzig, Karl-Marx-Universität (Hubert Henkel)

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Organological Index:

All instruments: Brian Butler (M,R); Josef Marx (C,P,W); Laurence Picken (C,P,W)

Percussion: John Betts (M,C); Edmund Bowles (C,P,W).

String Instruments

General: John Betts (M,C)

Psalteries: Winsome Evans (P)

Misc. zithers: Laurence Picken - koto, ch'in, etc (C,P)

Keyboards general: John Betts (M,C); Martin Geeson (M,P); Lawrence Marshall (M)

Piano: (delete Peter Ecker); Lewis Jones (C,E)

Harpsichord, etc: Winsome Evans - h (P);
Lewis Jones - h,v (M); Peer Schmidt-Petersen (res.)

Clavichord: Peer Schmidt-Petersen (res.)

Plucked strings general: Lewis Jones (M)

Lute: Anthony Both (M) J.C.Macpherson (M,P) Robert Spencer
Michael Cole (M,P) Michael Nixon (M,P) Ian Strang
John Cummins (M,P) Peter Päffgen (res) Ian Theakstone (M)

Guitar: Winsome Evans (P) D.Skye - engl. (M,R,C,P)
Michael Nixon (P) Robert Spencer

Vihuela: Anthony Both (M)

New Group: Mandolin: Anthony Both - neap.

Cittern: add Mandore (m); Gittern (g):

James Bisgood - m,g,c (M,P); R.Lawrence - b,o (M); Ian Strang - c

Bowed strings general: Lewis Jones (M)

Rebec: James Bisgood (M,P); John Cummins (M,P); R.Lawrence (M)

Viola da Gamba: John Cummins (MP) Harry Shorto (C,P)
Martin Edmunds (M) Ian Strang

Hurdy-gurdy: William Hullfish (P, res)

Harp: Peter Ecker (M); André Schaefer

Wind Instruments

General: William Hullfish (P); Josef Marx (C,P,W)

Woodwind general: Trevor Downing (M) Jacques Leguy (M,R,P,W) Norman Sohl (M,R)
Lewis Jones (C,P) Elaine McDonald (M,P) Ian Strang

New Group: Notch Flute: Dan Mayers - shakuhachi (M,R,C,P)

Transverse Flute: John Cousen (M,P); Lewis Jones (C,P,R); Harry Shorto (C,P)

Recorder: John Cousen (M,P); Maria Dives (M,P); Lewis Jones (P)

Gemshorn: Brian Radford (M)

Crumhorn: Winsome Evans (P) Racket: Winsome Evans (P)

Curtal: John Cousen (M,P)

Oboe: Philip McCrone (M,P); Josef Marx (P,C,W); David Reichenberg (M,P)

Shawm: Winsome Evans (P)

Bagpipes: John Cummins - smallp. (M,P)

Brass: Brian Radford - f'hole horn (M); Ian Strang

Cornett: Winsome Evans (P)
Jacques Leguy (M,R,P,W)
Christopher Monk - & serp (M,P,W)
Harry Shorto (C,P)

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Geographical Index

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Anthony Both, —

Austria: David Reichenberg, Salzbg

Canada: Lewis Luthier Supplies, B.C.

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Edmund Bowles, Virginia
Norman Sohl, —
Univ.Washington, Wash.

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Members are asked to advise of any errors, omissions, corrections, or additional information as soon as possible for inclusion in the next Supplement.
They are also earnestly requested to advise the Secretary when they change their address.

FoMRHI Com. 65

ON THE SIZES OF RENAISSANCE AND BAROQUE VIOLS AND VIOLINS
E Segerman

I have been musing over the sizes of violins and viols in the middle of the 16th century and am now collecting data for the purpose of proving or disproving the working hypothesis below. If any reader takes it seriously enough to help either support or smash it, I would love to hear from him.

Hypothesis

Around 1550 typical string lengths for violoni (viols) were, in meters, .5 for treble, .7 for tenor and 1.1 for bass, with highest strings at a' d' and g' (or a') respectively. The three string lengths of viole (or violette) de braccio (violins) were half that of the violoni with highest strings an octave higher.

Between 1550 and 1600 highly improved bass strings (called Venice Catlines in England) appeared and each family responded in a different way. In Italy violoni dropped in size by about 20% for facility in playing using the same tunings, resulting in lengths .4, .6 and .8 meters respectively. These new instruments were then called viole da gamba. When they were exported to England and France they were tuned as high as they could go, to c'', f' and c' but called by notes a tone higher. When playing alone the English viols tuned down close to the Italian pitch level for sweetness of sound. The lowest of the original sizes of violoni was retained as a double bass instrument and it alone retained the original name. It was tuned an octave below the tenor in both the Italian and English pitch levels. The Italians experimented with a double contrabass instrument with string length 1.3 meters.

The original small treble viola da braccio was unaltered but a new large treble intermediate in size between the original treble and tenor called the 'violino' came to prominence. The tenor retained its size for ease of playing but was tuned down a 4th for the new deeper sonority this family was striving for. The original bass (that was usually played suspended vertically from the clothing while played in a standing position) was abandoned and a new bass about twice the size of the tenor appeared. Also a contrabass with about 3 times the string length of the violino was sometimes used. Both new bass and contrabass often had 5 strings. All viole de braccio were tuned in fifths and this was the main distinguishing factor (with lack of frets being second) when compared to the viole da gamba.

When overspun basses were invented in the last half of the 17th century, the French were the first to adopt it. They reduced their viol string length by about 10% for ease in playing and to have them at the same pitch standard as most other instruments. These are the standard lengths used on viols today. Overspun bass strings were quickly adapted for the bass violin and its new use caused it to be renamed 'violoncello' (see Comm 44b Point 115.87.4). Early in the 18th century it contracted 5 % for ease of playing. The name of the tenor (viola or violetta) seems also to have remained because its size survived from the beginning. An overspun 4th string was not used on the violino till the 19th century.

So sharpen up your knives and pencils gentlemen and lets us hear from you.

THE RANGE OF PITCH WITH GUT STRINGS OF A GIVEN LENGTH.

William B. Samson

Eph Segermann and Djilda Abbott have done much valuable work in the technology of gut manufacture and have shown that early gut basses must have been more highly twisted than their modern counterparts.

I intend to set out, below, the range of pitch necessary on the open strings of gut strung instruments during the 16th and 17th centuries and also to highlight the problem of the 10-course renaissance lute which arises from these figures.

In the 16th century the strings of a lute or viol had a range of 2 octaves for a given string length. We may probably assume then that the strings available at that time were unsatisfactory outside that range.

By the start of the 17th century the range of the lute was extended, nominally downwards, by a fourth on 7- and 8-course instruments and by a fifth on 10-course lutes in renaissance tuning. This implies an improvement in available gut at that time.

If we assume that 10-course lutes in renaissance tuning were normally single headed instruments the range of pitch on the open strings was 2 octaves and a fifth.

In the mid 17th century the author of the Mary Burwell lute book states that although the nominal range of an 11-course lute in Dm tuning is 2 octaves and a fourth, it was customary to omit the bass string on the 11th course and use only a single (high) octave string, because of the poor tone of the thick bass string. This reduces the range on open strings to 2 octaves and a third.

It is thus apparent that the range of the 10-course renaissance lute was 2 tones greater than that of the 11-course French lute a few decades later. I list four possible reasons for this:

1. Early 17th century players were less fussy about the tone of their bass strings than mid 17th century musicians.
2. The quality of available gut fell off during the 17th century.
3. The pitch of the whole instrument was higher, for given string length, in the early 17th century and players tolerated the higher breakage rate of strings.
4. The 10-course lute in renaissance tuning was not a single headed instrument but carried its diapasons on an extended head, giving them a longer vibrating length.

Possibilities 1, 2 and 3 above are all arguable but it is unlikely that we shall ever know for certain whether they are true or not. We do know, however, that extended head lutes of 10 or more courses did exist at that time. For example the paintings of Molinaer and the 'testudo theorbata' of Praetorius show such instruments. If the 4th reason listed above is the correct one then the single headed 10-course lutes which appear in many paintings must have been tuned in a low-range tuning such as the flat French tuning or theorbo tuning with the 1st course tuned down an octave, giving ranges of 2 octaves and a third and 2 octaves and a note respectively.

We may thus conclude that a satisfactory range of 2 octaves and a third was achieved on the open strings of single headed instruments. Whether this was ever as much as 2 octaves and a fifth , on the 10-course renaissance lute, is open to question.

FoMRHI Com. 67

THE PRINCIPAL INSTRUMENTS OF FOURTEENTH-CENTURY ITALY AND THEIR STRUCTURAL FEATURES: A PRELIMINARY DESCRIPTION

Howard Mayer Brown

This very preliminary set of descriptions of instruments seen in the hands of 14th-century Italian angels is intended as the beginning of an attempt to associate particular instrumentaria with particular repertories of music. The list is a summary of the information to be found in trecento paintings, miniatures and sculptures. I cannot claim to have looked at all surviving trecento works of art, but I have tried to look at all published pictures I could find.

I have omitted instruments which appear in only one or two pictures, such as the ala bohemica, the bladder pipe, the hurdy gurdy, the fingered animal horn, and the recorder (which seems to appear before about 1400 only in a handful of Sienese paintings from mid century), on the grounds that they are not likely to be among the 'principal' instruments of the period. I have called the small round-backed plucked string with sickle-shaped pegbox a 'mandora' even though Ephraim Segerman (FoMRHI Communication 44a, par. 27.25.4) would prefer 'gittern'. One strong reason for preferring E. S. 's terminology is that some minstrels in the late 13th and early 14th centuries in Italy are called 'della Chitarra.' Since no flat-backed plucked instruments appear in trecento works of art, I would assume that what I have called 'mandora' the Italians would have called 'chitarra.'

I would be very grateful for any information about pictures that contradict my summary descriptions, and for information about pictures that show instruments I have omitted.

KEYBOARD INSTRUMENT

PORTATIVE ORGAN. Supported on the left knee or by a strap which allows the performer to stand while playing.

Book-shaped or rounded bellows attached at the back (or more rarely at the bottom) of the instrument.

Keyboards fitted out with rather narrow keys or with buttons (keys and buttons appear in pictures with approximately equal frequency).

Relatively small portatives seem to have had but a single row of pipes. Some large instruments had three or four rows of pipes, evidently divided into ranks since some are provided with 3-5 levers, presumably stop knobs, protruding from the side of the case furthest from the player. Many, and perhaps most, had two rows of open flue pipes, with 12-15 pipes in each row. If the range were completely chromatic, the normal disposition gives a compass of two octaves or slightly more, almost certainly at four-foot pitch.

Some instruments appear to have had one or more drone pipes at the bottom of their range.

STRINGED INSTRUMENTS

FIDDLE. Both oval and more or less waisted body shapes appear in the pictures, apparently in a variety of sizes. The waist is a graceful and rather gradual indentation ; no trecento fiddles are shown as figures of eight or with corners, etc. Waisted fiddles predominate in the last quarter of the century, perhaps as performers felt more frequent need to play individual melodic lines rather than merely drones, and hence had to be able to make each string sound separately.

Most fiddles have C holes and a pegboard built in oval, leaf-shaped, rectangular or some more irregular shape.

Most fiddles have a separate fingerboard without frets, although some seem not to have had a fingerboard.

Fiddles are supported against the neck and played either straight out (more or less like a violin), or held with the pegboard pointing toward the ground, almost vertically.

Some fiddles are shown with 5 strings and some with 6, but most have either 4 strings, or else 4 strings running over the fingerboard (or neck) and a 5th running beside the fingerboard, which must have served as drone. Sometimes the performer's left thumb is shown sticking up over the left side of the neck in a position to pluck the drone string.

Fiddles are variously shown with curved bridges, apparently flat bridges and with string holders that seem to have had feet serving in place of bridges (on instruments that could presumably only play drones).

Can it be that instruments with long string holders coming almost halfway up the instrument, as high as the midpoint between the two C holes, played drones exclusively, whereas instruments with relatively short string holders and separate bridges may have been those required to play individual melodic lines?

Most bows are relatively long with a considerable arch to the stick. Some bows are held by a wooden handle. A certain variety of bow grips appear, but some players hold the handle, or the end of the bow, in a rather fist-like grip.

REBEC. Pictures of rebecs are exceedingly rare before the last two decades of the fourteenth century. Most of the earlier representations are rather crudely painted pictures by provincial artists, and some of those show what can more accurately be called a mandora bowed in a gamba position.

Late trecento pictures show rather slender instruments, most of them played in a gamba position, supplied with two strings. They seem to be drone instruments.

LUTE. Various sizes of almond-shaped lute are shown, almost all with a peg-box bent back at right angles to the strings.

Most lutes have a central sound hole, and many have a smaller sound hole as well above the principal one.

Very occasionally lutes are supplied with frets, but normally the instrument has none.

A few lutes are shown with 4 or 5 single strings, but most have 4 double courses or three double courses plus a single top string.

The instrument is normally played with a plectrum, and some lutes have a plate beneath the strings near the bridge, apparently to protect the table from the plectrum.

TRECENTO INSTRUMENTS - 3

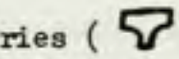
MANDORA. Most pear-shaped mandoras are smaller than lutes.

Mandoras are supplied with a sickle-shaped peg box, often ending in an animal's head.

Most have one relatively large central sound hole.

Mandoras are normally fretted.

Mandoras normally have four double courses and are played with a plectrum. Some instruments have a plate beneath the strings near the bridge, apparently to protect the table from the plectrum.

PSALTERY. Incurved trapezoidal psalteries () predominate in the pictures, although some show instruments built as trapezoids without incurved sides, or as semi-trapezoids or rectangles.

Psalteries are normally played against the chest, long end up, although some players hold the long end down, or (much more rarely) to one side. At least one trecento angel holds the instrument in her lap.

The incurved sides may have been devised to allow the player to hold the instrument up and yet play with both hands. Slightly more pictures show performers using both hands than those which picture angels playing with only one hand and holding the instrument with the other.

Most pictures show players using at least one plectrum, but some show two plectra and some show performers plucking the strings with their fingers.

Psalteries are provided with a central sound hole or with a central sound hole plus several smaller ones in the corners of the instrument.

Most psalteries are triple strung, though a few have single strings and some have double or quadruple courses.

The number of courses ranges from 7 or 8 to 21 or 22. Many have between 11 and 15 courses. If the instrument were tuned diatonically, it would have a range of an octave and a half or slightly less.

HARP. Most trecento harps have a slender 'Gothic' shape, with a more or less gently curving pillar attached to the neck at a sharply pointed angle. In some harps the pillar joins the neck in a wavy loop, and some are decorated with an animal's head. Within that general body shape some harps are squatter than others.

A few pictures show harps with a heavy neck, apparently made from material different from that of the pillar, and a few show harps of an entirely different, and perhaps improbable design, without a clearly distinguished neck and pillar.

The number of strings is variable. Some harps have between 12 and 14 and others 20 to 30. If the harp were tuned diatonically it would have had a compass either of one and a half or of three octaves. A few trecento harps are pictured as having double courses.

No brays are visible on trecento harps.

Harps are played on the performer's knee or suspended from his neck by a strap. They are invariably played with both hands, usually the left above the right. Most of the pictures showing the player's right hand above his left are those in which the harpist sits on the right facing toward the middle of the picture.

WIND INSTRUMENTS

TRUMPET. The instrument consists of a long, narrow tube, almost always longer than the player is tall.

The tube appears to be cylindrical. Many have a single joint towards the end, where the more or less widely flaring bell was attached to the tubing.

Players are usually shown supporting the instrument from below with one hand and grasping it from above (close to the mouthpiece) with the other hand.

Performers usually hold the instrument straight out or slanting upwards, with the bell well above the player's head.

SHAWM. The bore appears to be rather wide in relation to the length of the instrument. Some shawms have a markedly conical exterior, although most seem to be cylindrical (except, of course, for the flared bell).

Almost all shawms flare at the end. There may have been two quite distinct instrumental types: a fairly short instrument with a very widely flaring bell, and a type built in various sizes with a rather long cup-shaped bell at the end.

Shawms are pictured in various sizes from quite short (half an arm's length or less) to quite long (up to three-quarters the length of a kneeling person). Presumably, then, there were instruments capable of playing at least parts of the entire gamut from G to e''. The Baroncelli polyptych in Santa Croce (Florence) shows three sizes divided among four instruments, but it would be unwise to generalize about standard sizes from this one example.

While it is almost always impossible to count the fingerholes, the artists' intentions seem to be to suggest a hole for each available finger. Thus shawms almost certainly had six or (if there were a thumbhole) seven holes.

Players invariably use a pirouette, which is almost always visible, pressed against the player's lips. (Since the pirouette looks rather like a large cup mouthpiece, shawms can sometimes be mistaken for trumpets, although the latter are almost always longer and have thinner tubes.)

Most performers are shown playing with puffed cheeks.

Shawms are held either straight out, like trumpets, or pointing toward the ground at an approximately 45 degree angle.

One or two pictures quite clearly show a cord attached to the bell of the instrument and running to the player's head. The only explanation for the presence of these cords that occurs to me is that they were used to support the instrument, easing the strain of playing for long periods.

Approximately equal numbers of players are shown with their left hands above their right and vice versa. There is a high degree of correlation, though, between their hand position and their place in the picture (figures on the left in a picture play with their right hand above their left, and figures on the right in a picture play in the opposite way so that symmetrically arranged figures balance each other.)

BAGPIPE. Like shawms, the chanters of bagpipes are shown with relatively wide bores, some being markedly conical, but most cylindrical. Almost all chanters flare at the end, and some have a distinct bell that takes up part of the tube.

Most bagpipes have a single chanter and a drone resting against the player's left shoulder, although some bagpipes lack a drone.

DOUBLE RECORDERS. A single performer plays two separate instruments, not joined together. They project from his mouth at a 30 to 45 degree angle from one another.

In most pictures both tubes seem to be of equal length, although in some one tube may be slightly longer than the other (not enough to suggest that one had a different fundamental pitch from the other).

Most instruments have long fairly narrow tubes. They are generally cylindrical, although some instruments seem to be slightly conical, and a few are markedly conical.

In a few pictures the window or beak shape of the mouthpiece are visible but in most pictures no details of the head of the instrument or of the player's embouchure can be seen (so there is a remote possibility that some of the instruments use reeds rather than a whistle head).

Simone Martini's fresco showing St. Martin being invested as a knight -- one of the most detailed pictures of a double recorder, albeit an instrument played by a professional minstrel rather than an angel -- shows one pipe stopped at the end (the end of the other pipe is not visible), with a lateral vent hole. Most other pictures, though, clearly show open-ended pipes, and in a few pictures one bore seems slightly wider than the other.

It is almost never possible to count the number of holes in each pipe, although often, as in the Martini fresco, there seem to be more holes than fingers available to stop them.

In some pictures, the performer seems to be using the same fingering on both pipes. In some pictures the performer seems to be fingering towards the end of each pipe.

(Although the hypothesis does not account for all the known attributes of the double recorder, it seems to me plausible to suppose that each pipe had no more than 3 or 4 fingerholes and no thumbhole and therefore

a range of no more than a fifth. It is difficult to imagine how such instruments could overblow. Is it possible that the two pipes, although the same length or nearly so, were tuned to different pitches, perhaps a second or a third apart, giving them a composite range of an octave or a ninth, sufficient to play most trecento melodies? That notion presupposes a complex playing technique involving constantly changing use of drones, parallelisms and doubling.)

PERCUSSION INSTRUMENTS

TAMBOURINE. A shallow frame drum with a single skin and double rows of jingles, usually six or more, set equidistantly around the frame.

Tambourines are struck by the fingers of one hand.

Some tambourines have one or two snares. Some pictures show a single-skinned frame drum without jingles. One picture seems to depict a frame drum with cord tensioning, and hence implies two skins.

KETTLEDRUMS. Two fairly small kettle-shaped drums, each with a single skin, are normally suspended by a strap around the waist of the performer and played with two sticks.

Some drums have one or two snares.

The skins of some are secured by lacings that enclose the entire kettle.

One picture shows kettledrums strapped to the back of one person, and played by another.

CYMBALS. Two fairly thick plates, some with bell-shaped centers.

They are held with one cymbal resting above the lower hand and the other hanging below the upper hand, so that the plates are horizontal and the hands come together vertically.

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COMMENTS ON TECHNICAL DRAWINGS AND PHOTOGRAPHS OF MUSICAL INSTRUMENTS

R.K. Lee

Because technical drawings of musical instruments serve several different user communities, early in my plan publications I adopted the rationale of showing or describing all of the factual information available about the instrument, without interpreting or suppressing details, a few of which might not interest some purchasers. I believe that it is a mistake to make assumptions about what kinds of information will be of interest to buyers of plans if these assumptions result in the loss of information about the instrument. After all, the purpose of instrument drawings should be to display information which is not available in a regular museum examination of the instrument and to lessen the need to handle the instrument for either scholarly purposes or duplication by a maker.

Technical drawings are useful to builders of instrument replicas, builders of less authentic instruments who may wish to synthesize the characteristics of several instruments into a new design, restorers who need authentic data for supplying missing elements on the object of their work, scholars who wish to compare various features of historical or technical interest in a quantitative manner, as well as amateurs who may wish to build an instrument, and lastly those who wish to project an artistic presence with handsome wall decorations or as backgrounds to musical exhibits. While I believe that the needs of the first four types of user should dictate the content of the drawing, the needs of the remaining types of user are not despicable at all from the viewpoint of education and the nurturing of an interest in musical instruments. In order to supply intelligible information to such a diverse community, I believe that the drawings should be as clear and explicit as possible. Unfortunately, modern mechanical drawing methods rely on a wide variety of conventions which are seldom clear to a person who is unfamiliar with them. Frank Hubbard[1] originated a return to the illustration style of the pre-industrial

[1] "Three Centuries of Harpsichord Making," F. Hubbard, Harvard Press, 1965.

engraver and which is still used in patent offices in most countries for its conciseness and clarity. The plates of the Diderot Encyclopedia are in this style and have seldom been surpassed either for clarity of exposition or beauty of style. Philosophically the drawing approach of the illustrator should be used instead of that of the industrial draftsman. In my own drawings, a cartographic presentation which is familiar to most people is used and eliminates much dimensioned line work.

Who should make drawings? I submit that drawings made by a modern German accredited Clavierbaumeister, while useful perhaps for one part of the user community, would be highly suspect to the person who builds precise replica instruments, whether the suspicion was deserved or not. A tradeschool draftsman does not in general have sufficient technical background in musical instruments to reliably translate the physical evidence into a useful concise drawing. At the other end of the spectrum, the musicologist, or historian-curator does not usually have the technical knowledge of building and construction which will allow him to supervise drawing preparation. The restorer of instruments has, however, the appropriate technical background and the opportunity afforded by disassembling the instrument to collect information for technical plan preparation, as well as a background in technical scholarship.

Accordingly, I would plead that all of our institutions follow the example of the Russell Collection of the University of Edinburgh, or the Ruckers Genootschap in collecting this information as a part of the restoration process, perhaps as an adjunct to the restoration report. The fact that a technical drawing is much more concise than text in presenting data should be an incentive to the restorer to prepare drawings for that reason alone.

Mr. Barnes (Communication Number 46, this publication) has given such an excellent summary of what should be in an instrument drawing, that I would have difficulty in augmenting his list from the viewpoint of an instrument builder. However, I would like to say that there is a need for at least two kinds of drawing, the historical drawing discussed here and the building drawing used by the maker.

I would and do expect instrument makers to produce their own building drawings using the historical plan as a source of data. The building plan will account for specific manufacturing techniques and materials that may be available to a given builder and would not be good from a historical viewpoint. I differ from Mr. Barnes in that I prefer to put all data and notes onto a single large drawing sheet. A single sheet of paper has advantages to both the producer and the user in that only a single piece of paper need be filed on an individual instrument. It is administratively much more cumbersome (and a potential source of error by accidental omission) to handle drawings, notes on individual sheets, and perhaps several sizes of photographs for each instrument. Therefore, I like to see information on provenance, data on signatures, data on related or similar instruments, decorations, and accessories such as stands, music desks, and cases presented on the drawing itself. A fine example of this drawing approach is the "Clavichord: Anonymous c. 1700," by Richard N. Loucks under the auspices of Peter Williams, Director, and John Barnes, Curator of the Russell Collection of Early Keyboard Instruments.

The quality of the data presented in a drawing should be explained so that the need for further research can be identified and so that the user can evaluate the information with respect to his own application. For example, if wood species are determined by the restorer's experience as contrasted by professional microscopic botanical techniques, this should be so stated. Similarly, some estimate of the precision of measurement should be given. In my opinion, the precision of measurement should somewhat exceed the requirements of the average maker, with the purpose of reducing or eliminating the desire to remeasure the instrument for increased precision. For instance, if wind instrument bores were given in hundredths of a mm. and accounted for the axes of the nearest fitting ellipse (with an estimate of moisture condition), there are meticulous makers who would be grateful for this class of information. From a technology standpoint there remains much to be done on characterizing a musical instrument by various

measurement techniques. The purely geometric techniques discussed here are mostly relevant to keyboard instruments. We should not forget that acoustical physical data can be collected by various means and that they should eventually become part of the data base for an instrument as well as geometry.

If the restorer is not for some reason inclined to make drawings, a set of detailed photographs should be taken of the instrument when apart, as for example, the excellent series on the small Ruckers harpsichord of 1644 put out by the Ruckers Genootschap. This group of photographs depicts each major joint, the keyboards, action parts, and all of the internal framing of the instrument. Speaking as a photogrammetrist, however, I feel that all museums can do much to improve the value of their photographs to the users who frequently would like to measure something on the photograph in addition to the more qualitative or interpretive use that is made of pictures. Most modern photographic objectives (excepting zoom lenses!) have a distortion of less than one percent of the largest dimension of the field of view. Therefore, for measurement precisions more gross than one percent, we can use the photograph from almost any camera, provided that it is aimed squarely and that there is a calibration object of the largest possible size in the plane of interest, or that there is auxiliary information such as exterior dimensions available that will permit a simple calibration of the photograph. In order to be consistent with a one percent measuring precision, the camera should be square to the plane of interest to within about one half of a degree of arc, which requires some attention on the part of the museum photographer. Most photographers, if advised of the need to avoid perspective distortions, are knowledgeable enough to do so if requested. Squaring on can be accomplished either with a mirror accessory (Hasselblad) or by means of rendering parallel lines parallel on perpendicular axes, on the ground glass. This type of photography is well suited to keyboard instruments, where most of the information of interest lies in one or two planes that are flat.

X-ray photographs have the same geometry as pictorial photographs. The X-ray plate should be precisely parallel to the plane of interest in the object, and a solid object of known dimensions should be placed in that plane during exposure. It takes only a little more trouble to take stereoscopic X-rays than to take a single exposure. A second exposure should be made by shifting either the X-ray source or the object to one side by an amount equal to about one-tenth to one-third of the distance from the X-ray source to the plate. Stereoscopic X-rays have the advantage that all effects of perspective distortion can be removed by means of photogrammetric techniques, while the trouble of setting up an instrument is just the same as for conventional monoscopic photographs. I have always wanted to investigate wind instruments by means of stereoscopic X-rays, with the bores outlined by means of barium sulfate powder. The measurement precision by modern photogrammetric methods is potentially high and minimizes the need to handle the instrument. Unfortunately, the mathematical data reduction needed requires a sizeable computer for convenient exploitation of this approach.

Historic instruments frequently are distorted because of the vicissitudes of age and stress. It is important to state in a drawing whether these distortions are removed or are present. Justifying or correcting these distortions when making the drawing involves a risk of information loss. This loss can either be that the distortion was really put there by the maker, or that the distortion reveals information about the structural stability of the instrument depicted. Several years ago in a conversation with Frank Hubbard, he remarked that until he realized it, he drew Flemish harpsichords with cheekpiece and spine parallel, not being aware of the fact that they converge away from the player (presumably so that the keybeds are easier to remove and are not liable to get stuck). Similarly, a recent visitor to my own collection pointed out that the soundboard of my Bull harpsichord went uphill towards the tail so that a thinner base bridge section could be used. I

must apologize to the earlier purchasers of my Bull plans for not having discovered this sooner. Therefore, as a word of caution, many small dimension effects were put there on purpose by the maker, and we should be very circumspect about removing this factual evidence in an editing process.

During the last six years, I have investigated several techniques for measuring keyboard instruments. Because I am a photogrammetrist, I prefer that technique. The advantages are that most measurements can be made without physically touching the instrument, the precision is high compared to most builder needs, and the photogrammetric data plates constitute a permanent record from which later measurements can be taken. For instance, the progress of stress distortion can be observed over many years by this method. A photographic/photogrammetric survey of a keyboard instrument can usually be carried out in one day with one disassembly of the instrument. Including data for individual fact details, one hundred to two hundred photographs might be taken of a straight forward instrument such as a bentside spinet. Direct measurements using trilateration with a trammel are almost as precise, but are much more time consuming. The small Ruckers harpsichord took about seven working days for direct measurement and detail photographing. The preparation of a plan manuscript takes about 160 hours, depending upon its complexity, but mostly depending upon how much missing information has to be ferreted out using various auxiliary methods such as rubbings and internal probing. In my photogrammetric technique, the largest source of error is the transfer of control point dimensions by direct transfer to mylar master sheets, similar to a rubbing. In the trammel method the largest error source is the measurement of long dimensions by means of a tape measure. In all methods, it is very difficult to locate internal details precisely with respect to the externally visible details. The local or short distance accuracy of the photogrammetric approach is of the order of 0.1 to 0.5 mm. in height and planimetry. The long distance accuracy of control transfer is of the order of 2 to 5 mm., depending upon the

sag of the tracing sheet and how much I let it slip during transfer. Further errors are added by the tracing and drafting process, because I have access to only very simple equipment. With modern sophisticated photogrammetric equipment, on automobile models, precision attainable is of the order of 0.3 mm. in 3 meters on all three axes.

Measuring the thickness of soundboards with more or less inaccessible interiors, remains an outstanding problem in this field. Recently (1975), I sent a sample of soundboard to the engineering group of the Branson Company, a manufacturer of ultrasonic thickness measuring equipment. Their explanation for failure was that wood was not a good conductor of ultrasonic frequencies of a wave length consistent with their equipment capabilities and my desired 0.1 mm. precision. At the present time, the magnetic method appearing in this journal (Communication #4, by Martin Edmunds) would appear to be the most feasible technique, but has the disadvantage of requiring access to the interior of the instrument.

My hope is that the wide community of data users, the scholars, instrument builders, manufacturers, restorers, amateurs and dilettantes will demand from our various instrument collections the very best quality information that can be obtained by means of technical drawings and that the good quality of drawing and information presentation will in turn improve instrument conservation because of decreased handling. Similarly, I hope that the wide dissemination of data on instruments will improve the quality of musical performance because of the easy availability of good instruments upon which to play. Furthermore, if enough quantitative data becomes available, we may be able to better determine the provenance of instruments, (especially Italian ones), by comparison of their measurements.

ON THE DANGERS OF BECOMING AN ESTABLISHED SCHOLAR E. S.

Though the more experienced researchers in any field have the perspective to utilize new ideas and interpret new data more readily than the newcomers, and though their mental capacities are not in the least impaired by being a few years older, the newcomers come up with more than their fair share of the breakthroughs. These breakthroughs rarely come from pure imagination out of the blue, but rather involve re-examining the basics of the problem in the light of new data and ideas new to that field but current in other (usually related) fields. So, since the oldtimers are in a position to do this better than the newcomers, why don't they?

The answer in our opinion is one of psychology rather than one of scholarship, and established early-music scholars as well as other researchers should ponder this problem carefully in terms of the development of their own careers and the utilisation of the power they have deservedly acquired in their fields towards the unhindered advancement of these fields.

In our own experience we have found that all of the data needed to unambiguously solve a problem is rarely available [illegible], we ponder and struggle with the data that is available and the various ideas that we can think of for interpreting these data. We then come up with the best solution we can in the light of these data and ideas (sometimes publishing the result) and then go to other problems. When new data or ideas relevant to this topic subsequently come up, we remember the struggle and the complexity of our original deliberations on it without remembering the details, and so our first reaction is to defend the conclusions we came to against the new data and ideas rather than go through all that struggle again. This is psychologically most understandable but is clearly not in the interests of good scholarship. When we realise that this has happened we usually do go back to the basics and re-evaluate, but generating enthusiasm for this task is not easy.

The struggle of the newcomer to find a new understanding that is better than the old involves much joy, but reopening issues that one has already settled in one's own mind is most disturbing since we like to believe in the essential truth of the "knowledge" that our self respect as scholars is largely based on.

When some of our research or writing or just view of the field is based on conclusions of others which are taken on trust because we don't have the time or interest or the knowledge to delve into the data and ideas behind those conclusions, and then these conclusions are called into question, we again prefer to try to dismiss the new th[illegible], rather than to fully consider it.

We look for the obvious flaw, but if it can't be found, there is a great temptation to put the new theory aside and to try to ignore its existence until the time we (or hopefully others) can properly evaluate it. This intellectual laziness can readily be indulged in by each of the scholars capable of such evaluation, and if this is the case it is manifestly unfair to the originator of the new theory who has a right to either careful refutation or recognition of his contribution.

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It administers the government grant which has been allocated to the crafts and seeks to spend it in ways which will be of most benefit to craftsmen, both as individuals and in co-operative activities. In addition, it administers a grant with which to encourage certain skills essential to conservation. These grants come from the Department of Education and Science and are for England and Wales only. Scotland administers its own funds through the Joint Crafts Committee.

The CAC was formed in the autumn of 1971 and members serve on the Committee at the invitation of the Minister for the Arts. The present Committee has twenty-two members including practising craftsmen and other individuals with special knowledge of the crafts.

Crafts Advisory Committee Services

Grants and loans

Under the CAC Grants scheme, considerable financial help is offered to craftsmen at the beginning of their careers. Grants are offered for workshop training and to help craftsmen equip their first workshop and support themselves during their first year of business. Another grant is to encourage special projects planned by craft organisations, groups or individuals. This is a deliberately flexible scheme to give support to any non-recurring event, such as providing workshop or gallery accommodation, mounting an exhibition or making a film. In addition to grants, a loan fund has been set up to help established craftsmen who wish to enlarge their workshop or add to or modify their equipment, in order to improve their work. The loan is repayable over a period of five years.

The CAC awards a number of bursaries each year to give established craftsmen an opportunity to reappraise their work, or to pursue a specific project. Finally, a new Research, Study and Special Training grant is aimed at assisting the established craftsmen to undertake short periods of research or training as an introduction to new techniques or new materials. This grant excludes research for a book.

Similar grants are available for conservation.

Exhibitions

The CAC holds regular exhibitions in its Waterloo Place Gallery. The exhibition programme offers a varied view of current and historic work by artist craftsmen in Britain and overseas. The CAC also prepares touring exhibitions for England and Wales in conjunction with the Regional Arts Associations, and abroad with the British Council.

Publications

The CAC publishes *Crafts* magazine six times a year with features on crafts activity in Britain and overseas. It aims to stimulate public interest and offer a focus for craftsmen's ideas. It is available from Circulation Manager, *Crafts*, 28 Haymarket, London SW1Y 4SU.

In addition the CAC issues from time to time publications on various specialist topics.

Conservation

The CAC has an additional grant with which to encourage certain skills essential to conservation. It arranges specialist seminars and short courses for conservators, and can make grants and loans to conservators.

Regional activities

The CAC enjoys an excellent relationship with the Regional Arts Associations and receives their support and co-operation in furthering craft activities in England and Wales, such as the funding of small bursary schemes and craftsmen in residence. It also welcomes opportunities to advise and co-operate with Local Authorities, regional museums and art and craft centres. In addition, the Special Projects Regional Subcommittee considers grant applications with specific regional relevance and grants are allocated bearing in mind the special needs of craftsmen in different parts of the country. The CAC is now committed to a regular programme of craftsmen's tours to all parts of the country.

The Index of craftsmen

The Index is an illustrated guide to the current work of Britain's artist craftsmen. It consists of 35mm colour slides and biographical information provided by craftsmen who have been selected by a committee nominated by the British Crafts Centre. Anyone can make an appointment to consult the Index at the Waterloo Place Gallery, from 10 am to 5 pm, Monday to Friday. This free advisory service exists to encourage the commissioning of new work and is a unique source of reference for architects, interior designers, journalists, publishers, galleries and craftsmen themselves. An illustrated book, *Craftsmen of Quality*, based on the Index, is available.

Slide library

In addition to the slides on the Index, there are slides which form a record of diploma work, made in conjunction with colleges of art, and of exhibitions. The slides are available on loan to lecturers and organisations, free of charge. A series of slide packs is available on specialist crafts, the slides chosen by consultants to the CAC, with a short essay and descriptive notes.

Information

An information service is available on craft courses, craft shops and galleries, exhibitions, suppliers of materials and equipment, museums featuring crafts and crafts publications. Also available for consultation is the Register, a non-selective list of craftsmen in England and Wales arranged geographically, in which any craftsman may be listed.

The CAC is establishing an information service for conservation. This offers information on conservation craftsmen, training, workshop space and the supply of materials. It also helps to place those seeking specialist or technical advice in touch with informed sources.

The British Crafts Centre

The British Crafts Centre was formed as the result of a direct initiative by the CAC and is supported by a substantial annual grant. It is a membership organisation, and at the Earlham Street Gallery and the crafts shop in the Victoria and Albert Museum, provides major retailing outlets and excellent exhibition space for craftsmen.

The Federation of British Crafts Societies

The Federation was formed so that all craft societies could be represented by a single body. The CAC make an annual grant to enable it to promote the work of member societies and represent their members.

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PROFILE TURNING OF REAMER BLANKS FOR USE IN WOODWINDS

Rod Cameron

In the making of woodwind instruments there is a need to shape the bores of the various joints so as to produce the precise geometry dictated by acoustical considerations. In Renaissance and baroque instruments, if the bore diameter is plotted against length the resulting profile rarely follows the outline of a plain cylinder or cone. More often the profile consists of gradually increasing or decreasing 'parabolic' shapes with many local irregularities. In practice these shapes are produced by pilot drilling the wooden billet and finishing to size with a reamer shaped to the desired profile. The reamers may be of steel or wooden bodied with a steel blade insert. A profile tolerance of 0.05mm (.002") in the diameter is necessary to guarantee fixed acoustical properties in the instrument. The manufacture of the woodwind reamer then presents an interesting problem in precision toolmaking.

It is very likely that wooden bodied reamers as well as steel reamers were used originally. Steel reamers can be made in the simple lathe equipped only with a handtool rest. Their profiles can be filed as the blank rotates providing constant reference is made to the finished dimensions. The process is effective and laborious. Using the metal cutting engine lathe, the process can be speeded up by turning a succession of tapers and parallel portions to approximate the bore profile then using a file if necessary.

The method described in the following paragraphs is an alternative approach which has some advantages where the profile is complex, or where more than one copy is required.

Description of the Apparatus

Two basically similar setups are used. The first uses the lathe as a measuring machine to generate an expanded-scale graph of the bore profile. The second step is used during the turning of the reamer blank.

The first setup is illustrated in Figure 1. The cross slide lead screw is disconnected allowing the cross slide to move freely. Two fulcrum pins are rigidly mounted to the cross slide at (A) and to the lathe carriage at (B) respectively. A lever (C) and link (D) pivot in pins (A) and (B) and are connected by a third pin (E). The lever ratio x/y is large (1:17 in the writer's case). It will be appreciated that large circular movements at the stylus (F) end of lever (C) produce small linear movements of the cross slide. A pantographic linkage would produce true rectilinear motion at (F), however in this size and application the pantograph has problems of stability in the direction parallel to the lathe bed and was discarded in favour of the non-linear arrangement described above. Non-linearity is not a problem since the system is used to generate the cam profile, as will become clear later. At (F) a steel pin having a 60° cone point is set facing down. A dial indicator having a range of 1cm or more is attached to the cross slide as shown and bears against a block attached to the lathe carriage. The indicator registers small movements of the cross slide.

A work surface (G) is arranged parallel to the plane of the lathe bed and rigidly mounted to it. The writer uses 4" square x 1/8" pexiglass (J) to be bolted in position, removed, and replaced in the same location. The pexiglass is coated with toolmaker's marking dye to add contrast to scribed lines. An engineer's scale (K) is attached to the lathe carriage to record length settings by reading the scale at block (L) attached to the lathe bed.

Method

It is assumed that a set of dimensions of diameter versus length are available for a given woodwind joint and dmax is the diameter at the large end and dmin is the diameter at the small end. Convert all diamters to radii. Compile a table of length versus r_x, where r_x = (rmax - r) for each value of radius r.

With the reamer blank mounted between centres, position the detachable plate (H) and pexiglass such that it will be aligned with the end (F) of the lever when the blank is being turned. Set the compound slide rest parallel to the cross slide and move the lathe carriage until the toolpoint is facing the blank in the correct axial setting for rmax. Set block (L) to zero on the engineer's scale. Remove the reamer blank. Set point (F) over the pexiglass, and set the dial indicator to zero. Press down on the cone center at (F) to produce a punch mark on the pexiglass (the cone center will normally clear the pexiglass surface by 1mm). Move the lathe carriage to the next length setting and swing the lever carefully until the dial indicator registers the next value of r_x. Make another mark on the pexiglass at this setting and so on until every point is plotted.

Remove the pexiglass and join up the points with scribed lines to produce a continuous curve. Cut carefully along this line using the bandsaw and file to an accurate profile. Replace the pexiglass on plate (H). Reverse the cone centre point allowing a small ballrace on the other end to now bear against the profiled edge of the pexiglass. Fit a 3/16" dia cantilevered spring underneath the lever so that it bears the ballrace stylus always against the profile when the carriage tracks along the lathe bed. The reamer can now be profile turned using the power feed. Before the reamer is down to finished size, check the end diameters to ensure that their difference always equals the amount (rmax-rmin). If this is not so then the blank is not turning parallel to the lathe bed, and the tailstock should be set over until this is so, then finish turn to size. Do not leave too little to be removed in the finish cut. About 0.3mm (0.012") is good. Very fine cuts on a relatively flexible workpiece often produce chatter.

Discussion

Although an accurate description of the process is wordy, in practice the apparatus can be made in one day, and the setup takes about ten minutes to prepare. The pexigla can be sawn and filed in about fifteen minutes.

Notice that even with a tolerance as large as .55mm (.017") on the pexiglass profile, the resulting accuracy at the tool point is still .025mm (.001") because of the lever advantage. Notice also that the cantilever spring force bearing the stylus against the profile is multiplied seventeen times to produce the high rigidity at the toolpoint necessary in turning toolsteel. It will be appreciated that a magnified scale for the diameter axis of the profile is a great advantage in the preparation of the pexiglass profile. It would be tedious and impractical to prepare reamer profiles for a 1:1 profile turning setup when such small and important perturbations are to be produced.

It is desirable and not essential to turn the complete profile in one operation during the finish cut. On long thin-section reamers flexibility in the workpiece and resulting chatter at the tool point are complications. If chatter occurs, try modifying the shape of the tool first. It is the writer-s experience that tool point design can make a good deal of difference to the tendency to chatter. Sharp-cornered tools should be avoided in favour of the tool illustrated. If chatter continues, introduce damping to the systen

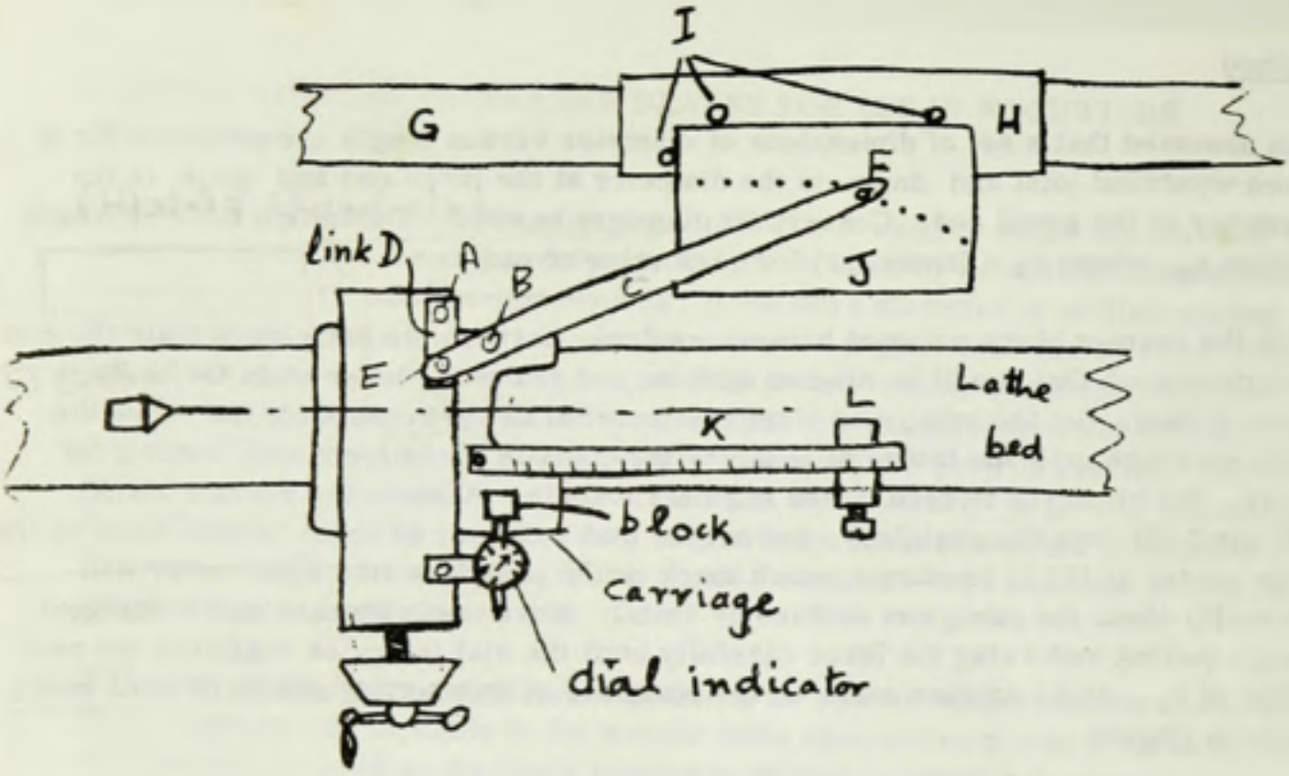


Fig 1 First set up

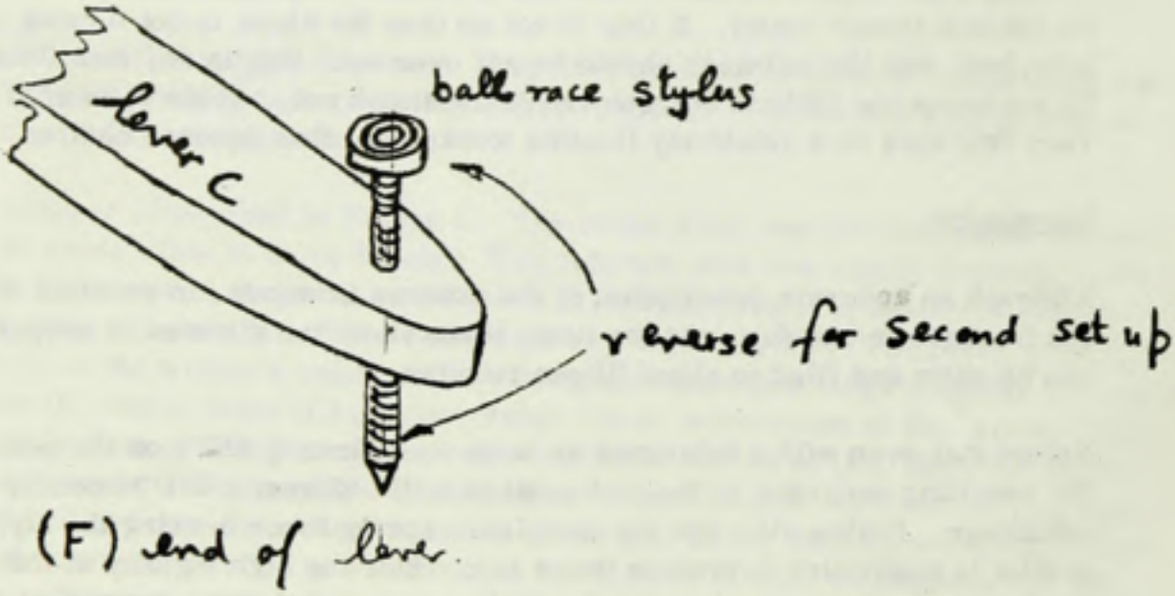


Fig 3

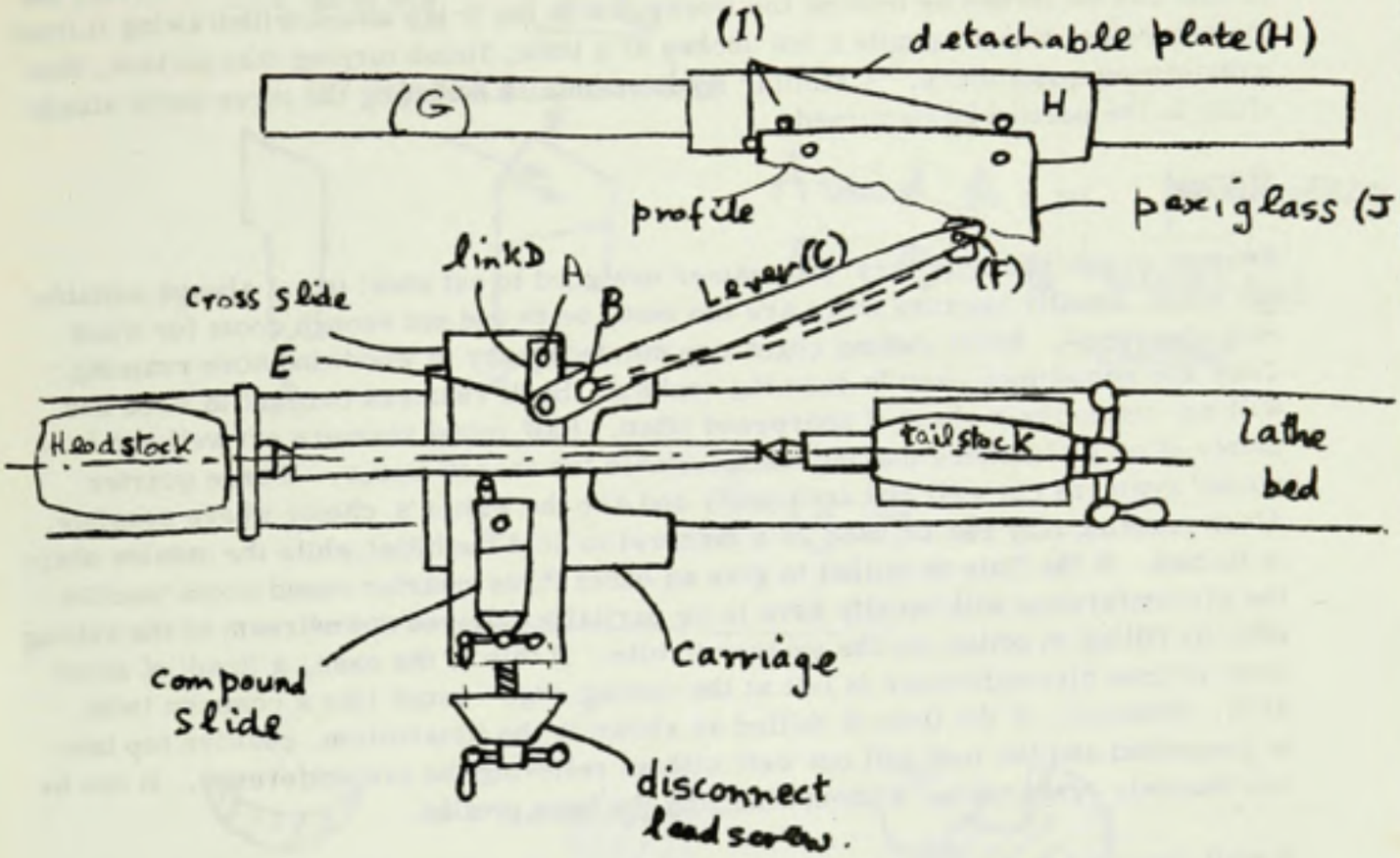


Fig 2 Second set up

by gripping the workpiece, as it revolves, with a heavy leather glove throughout the duration of the cut. Change hands smoothly as the tool tracks from right to left. If this does not work, as in the case of slender oboe reamers and bocal mandrels, the profile can be turned by holding the workpiece in the 3-jaw chuck withdrawing it from the hollow headstock spindle a few inches at a time, finish turning that portion, then withdrawing some more. A similar solution entails mounting the three-point steady close to the portion being turned.

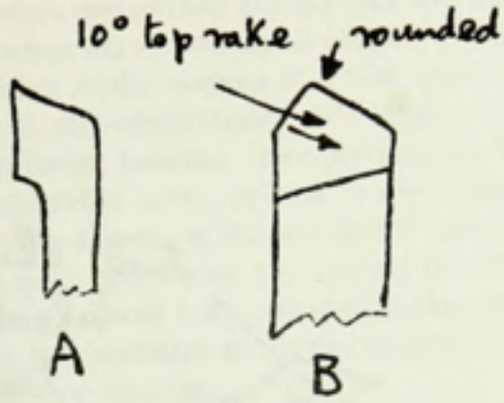
Milling

Reamer cross sections vary. A reamer designed to cut steel is not always suitable for wood, usually because there are too many teeth and not enough room for wood chip clearance. Multi-cutting edges are not necessary in woodwind bore reaming. They are sometimes used in reaming sockets. Shell reamers cut fast in wood and will not retain their shape if sharpened often. Half round reamers cut well and have plenty of chip clearance making them suitable for narrow bores. 'Three quarter round' reamers cut well and accurately and are the writer's choice where possible. After reaming they can be used as a mandrel to hold the billet while the outside shape is turned. If the flute is milled to give an exact three-quarter round cross-section, the circumference will usually have to be partially relieved downstream of the cutting edge by filling in order for the reamer to bite. If this is the case, a 'land' of about 1mm of true circumference is left at the cutting edge - much like a common twist drill. However, if the flute is milled as shown in the illustration, positive top take is generated and the tool will cut well without relieving the circumference. It can be continuously resharpened without changing the bore profile.

A well equipped vertical milling machine will have a dividing head and supporting tailstock. This equipment can be used to support the reamer blank during milling. Many shops will not have a dividing head. Alternative center supports and a vise needs to be raised to an angle in order to mill down past the horizontal diameter and still retain a positive grip on the workpiece. Cobalt alloy endmills hold their edge longer than highspeed steel, and are less expensive than tungsten carbide.

If an exceptionally slender reamer has to be milled, it is helpful to arrange a small trough around the blank once is set up on the mill between centers (a length of $1\frac{1}{2}$" square 'U' section aluminum will do). Pour molten lead (or some other low melting metal such as printer's 'type' metal) into the trough to encapsulate the reamer blank. When the temperature drops, grip the lead covered blank in the vise, tighten the jaws, then bolt the vise to the mill table lastly. The slender blank can now be milled without flexing or chatter. After milling, the cutting edge can be honed sharp using a fine brown 'India' stone. The edge may also be ground using a high speed 'dentist drill' type grinder mounted on the cross slide of the lathe. If the reamer is hardened before use it will retain its edge longer. With hardening there is the risk of distortion. A reamer which is bowed will cut oversize. If billet batches are not large, leaving the reamer unhardened and honing it every once in a while is the simplest approach.

Turning Tools



Avoid A in preference for B to minimize chatter

Fig 4

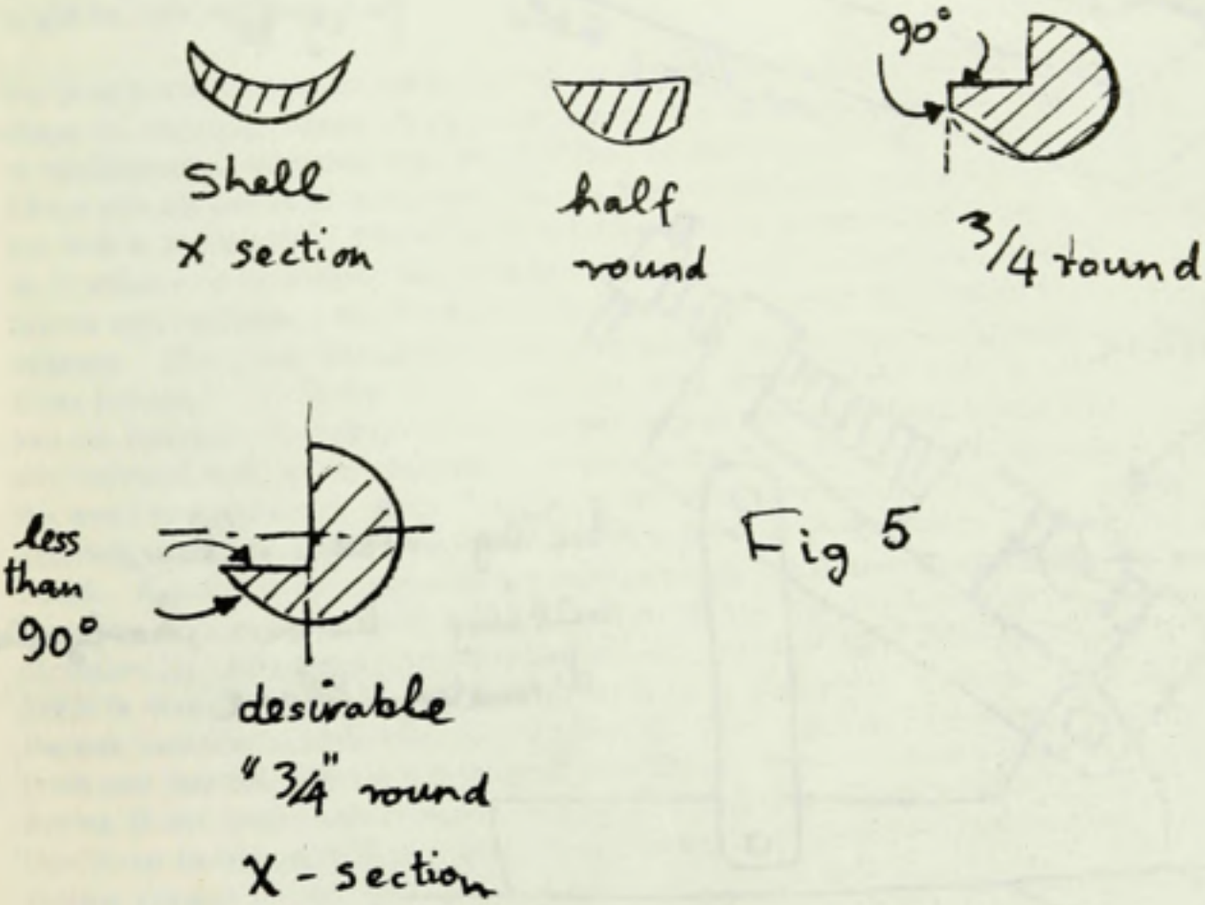


Fig 5

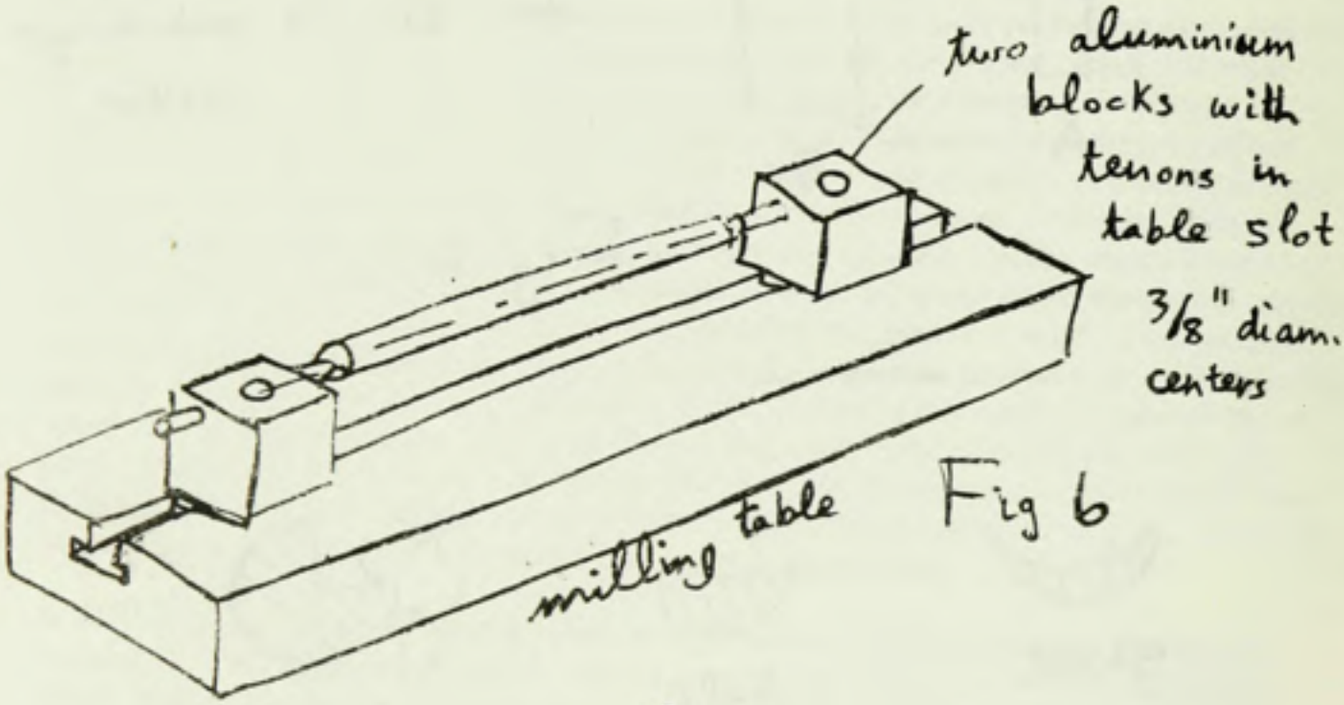

two aluminium blocks with tenons in table slot
3/8" diam. centers
milling table

Fig 6

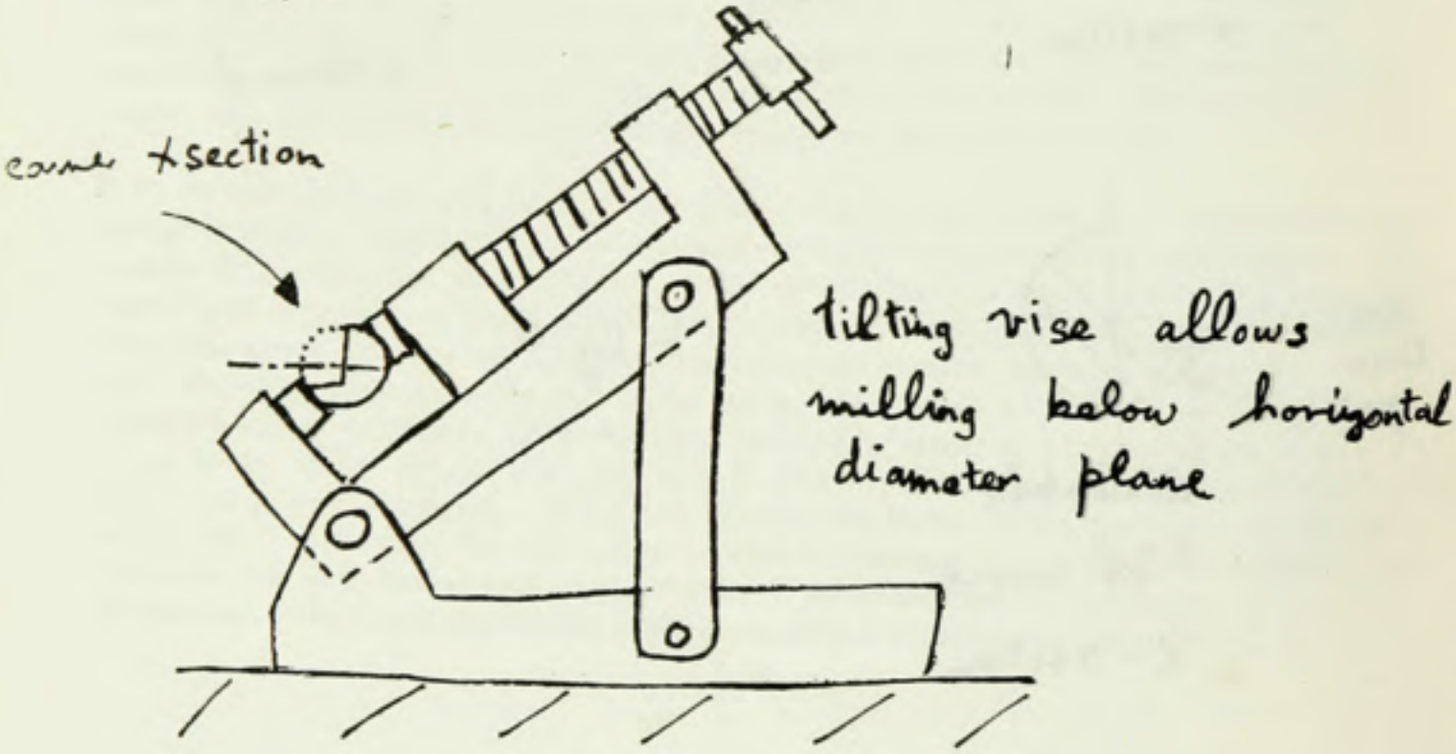

cone + section
tilting vise allows milling below horizontal diameter plane

Fig 7

HUMIDITY CYCLING FOR STABILIZATION OF GUT AND WOOD

D Abbott, E Segerman, D Rolfe

We have found when preparing gut strings for overspinning, that a gut fresh from the manufacturer, when stretched up to playing tension in a dry atmosphere, will settle and stop stretching in the course of a few days. However, if the string is moistened afterwards it will stretch further. We explain this in the following way: The gut is made at a much lower tension than the playing tension. The gut fibres are dried in their most comfortable juxtaposition to one another at the tension during manufacture (ie. they are in the lowest of the available potential-energy states). If brought to playing tension dry, the fibres are locked into their original juxtaposition. If subsequently wetted (eg. sweat from players' fingers, high atmospheric humidity) this gives the fibres the mobility to make the slight rearrangement necessary to stabilize the string at the new tension.

This has practical implications for a player who has to replace a plain gut string shortly before a performance. The more times (up to about six) that the string is moistened and let to dry and tuned up to pitch, the better it will keep in tune during performance. We remember coming across a quote in some Elizabethan play, when things are not going well while playing a lute - "spit into the hole and start again". The bawdy implications of this are clear but the overt part of the double entente might be relevant here.

We have found that wood cut from both air-dried and kiln-dried blocks often changes shape on standing, these changes happening faster in wet weather. We've seen parts of instruments centuries old, which if left in damp conditions warp out of shape. These are all cases of wood that has not been completely conditioned.[1] Our explanation for this is as follows: The wood in the live tree is in balance[2] with the external forces on it which are primarily the wind and the weight of the branches and foliage. These forces are variable - the wind can change, the weight of the foliage varies with the seasons. The wood fibres are formed in such a way as to push against and counteract these forces in the living tree. The first thing that happens when a tree and its branches are cut into logs is that the forces of weight and wind are removed and this change of environment will set up internal stresses in the logs.[3] The next change to assault the wood is in drying. When wood is dried, it contracts in a non-uniform way. In general, along the grain, (ie. the direction the tree grows) the contraction is very small. A much greater contraction occurs along the radial direction (ie the direction from the centre towards the bark) and about twice this amount in the tangential direction (ie. along the growth rings perpendicular to the grain direction) If the grain is straight in a board cut from the log, and no part is dried faster than any other, the non-uniform contraction can change the board's shape, and after drying it is free from any internal stresses. If drying is in the log or if the fibres wander some, or if drying is not even, some internal stress usually will remain. By this we mean that the fibres in one part of the wood are pulling one way but balanced by other fibres, pulling against them. The problem with a piece of wood that has internal stress is that its stability depends on the balance of the pulls (or stresses) between every part of it. When a billet is cut off from it the internal stresses in the billet can no longer be balanced by the stresses in the rest of the original piece of wood, and vice versa. There is now no counteracting pull of the other fibres to prevent these internal stresses "pulling the wood out of shape the way they want to" and warpage is likely to occur. We find that in such a billet (ie. dry but with internal stress) some warpage beyond that which occurs spontaneously can be induced by moisture.[4] It is important that a

piece of wood intended for inclusion in an instrument should firstly be allowed to warp and relieve these internal stresses, since until this is done it will always be at risk of warping sometime later. It is therefore recommended that the piece of wood be cut oversize just enough to allow for rectification of expected warpage, then soaked in water. To be sure that warpage is complete, we usually subject the wood to several cycles of soaking in a tub for several hours and then drying for several days in a drying cabinet kept at 25°F higher than the air outside.[5] Since using this procedure routinely we have not had any warpage problems on instruments we've made.

One may wonder whether rewetting the wood might defeat the purpose of drying it. But we find that after the drying the wood is as dry as it was before we wetted it, although when wet it appeared wet and swelled-up all over. This makes us suppose that there are some parts of the wood where the water gets in and out easily and other parts where it takes a long time. We presume that those parts of the wood that take a very long time to dry out don't get wetted at all when we soak the wood.

1 Meaning that the wood has not settled to its ideal (ie. minimum potential energy) shape, that shape being a function of atmospheric conditions especially moisture, and external forces like pull of strings in an instrument.

2 An oversimplification - we are not considering dynamics or breaking of the tree.

3 The important forces from the point of view of subsequent warpage are those forces that act cross ways to the grain, ie. the effect of weight on the branches and the places where the branches join the trunk. A trunk which grows straight up bearing the weight straight down (in line with its fibres) will not suffer this type of warpage, though a trunk which has been bent by a strong prevailing wind will, like branches, suffer warpage due to release of sideways forces.

4 Wetting a dry board with internal stress gives the fibres enough mobility to release some of that stress (by further warping). Wood that is air dried in sheltered conditions would tend to contain more internal strain than wood that has been more exposed to the humidity cycling provided by the elements. Hosing down kiln-dried wood seems to be a standard procedure followed by many kilners.

5 Our drying cabinet is kept at this temperature since, according to the Wood Handbook U.S. Department of Agriculture Handbook '72, this gives an equilibrium moisture content of 6% for the wood stored in it (p 14-9) and we aim for 6% since our instruments could well be played in the southwestern U.S. where this is the recommended figure (p 14-5).

FoMRHI Com. 69 - from page 35

We are sure that this approach of defending previously arrived-at conclusions against new ones is general amongst all scholars, especially when the old conclusions have been committed to print. There is no solution to this problem. We need to maintain constant vigilance against getting set in our ways and must fully accept the responsibility, traditional in scholarship, of going to considerable effort to give the new fellow a chance.

Review of:

The Manufacture of Musical Instruments, translated by Helen Tullberg. Picton Print, Citadel Works, Chippenham, Wiltshire. 1975; £2.50

Jeremy Montagu

Although there is no acknowledgment of the fact, either on the title page or elsewhere, this is a translation of the Lutherie plates and captions from the Encyclopédie by Diderot and d'Alembert, with, as well as the translation, a facsimile of the original French text of the captions and the plates. It appears to be at original size, and as a result the plates are very much clearer than in the ostensible facsimile, reduced in size and much more expensive, which was produced by Forni of Bologna a few years ago. To fail to say that this is the Encyclopédie seems to me to be lunacy - without wishing to be rude to the publishers who have produced this excellent edition, nobody is likely to buy an anonymous book of this title from any list or catalogue, whereas one would expect large numbers of people to jump at the chance of getting a facsimile of the Lutherie so cheaply, and to be grateful for a translation thrown in with it.

However, be very careful of the translation, and also of the footnotes. Not only are Diderot's few errors uncorrected, but a fair number of new ones are inserted. These I will detail below, but first let me stress that this edition provides a complete facsimile of captions and plates at an extremely low price - if you haven't got a facsimile of the Lutherie, it would be idictic not to buy this edition, and if you have the Forni edition you are strongly advised to flog that and to buy this one because it is bigger, clearer and cheaper; the only advantage of the Forni is that it is cloth bound whereas this is paper. My only regret is that Picton did not, while they were at it, also reproduce the individual articles of the Encyclopédie, which are listed after tge captions to the first set of plates - the Forni edition doesn't include them either.

The first set of plates covers the organ, and the translation of the captions for most of these seems accurate. Exceptions are pl.X where surely the French text (see the footnotes) is correct and also on which at fig.63 read "plane" instead of "place", and pl.XI, fig.68, which is a tuning schema or bearing, not a "score".

The second set of plates, however, have a number of inaccuracies and misprints.

Plate I The title should read: Ancient and foreign (not "unusual") instruments.

fig.12, "Echelettes". This is Mersenne's xylophone (Livre Troisiesme, p.176) and there is no evidence that it was ever a processional instrument, as stated here in a footnote.

fig.13, "Regal". Diderot gives Régales, but again this is from Mersenne (previous page to the last) who calls it Regales de bois or Claquebois, in other words a keyboard xylophone.

fig.14, "Chinese trumpet marine". Diderot again took this from Mersenne (Livre Quatriesme, p.228). It is, of course, an Indian viña (Mersenne seemed uncertain whether it was Indian or Chinese for he refers to both) and the trompette marine is Diderot's contribution - Mersenne has an interesting misinterpretation of his own!

Plate II

fig.22, "Covered cymbals". Diderot has Cimballes à tête, and I have no idea what either the French or the English means.

fig.26, "Provençal tabor and pipe". Diderot correctly names the drum as Tambourin. A footnote in the translation suggests that the pipe belongs with fig.23, the Béarnais tambourin (and incorrectly describes that as "a form of dulcimer"), but the French text firmly associates it with the Provençal, and the size makes it obvious that it is to scale with it. A similar pipe was also used with the Béarnais string drum, of course, but it would have been drawn larger.

Plate III The title again mistranslates étrangers as "unusual" instead of foreign.

fig.4, The French has Guitar simple instead of just "Guitar" - i.e. it is single strung as distinct from fig.3 which has multiple courses.

fig.9, Pandore en luth is translated as Bandora and defined in a footnote as a Penorcon; confusion of nomenclature among the bass citterns is such that it would be far wiser to assume that Diderot knew what he meant and to use his term.

Plates IV & V Diderot's Instruments qu'on fait parler avec une roue is translated as "Mechanical musical instruments". This is fair enough for plate IV, which illustrates a barrel organ and a serinette, but not for plate V, which shows the hurdy-gurdies. Both types are played by rotating a crank, but only the first are mechanical.

Plate VII Étrangers is mistranslated as "unusual" again.

fig.7, double cornet does not mean "double horn" but merely the larger size of hunting horn.

fig.10, A footnote denies the use of a bass cornett; see R.Morley Pegge's article on The Anaconda in GSJ 12 for surviving bass cornetti in Paris, though of different shape. The instrument shown here is clearly bigger than the tenor cornett (fig.12).

fig.13 "Crumhorn". Diderot says Tournebout, and a tournebout it clearly is and not a crumhorn; the proportions are correct for the former and wrong for the latter.

Plate VIII

fig.3, "Another fife", followed by a puzzled footnote because a recorder-like mouth is visible. Diderot, however, calls it Fifre à bec, which makes it clear that it is a fife blown via a duct, on which such a mouth is essential - one blows into, and not across, the hole which is placed in the position of the normal embouchure.

fig.5, There is a lunatic footnote suggesting that the bird flageolet may have been an European adaptation of a South American Indian whistle, but bird flageolets are well-enough known in Europe and were used, like the serinette, for teaching birds to sing tunes.

fig.8, Diderot's Dessus de flûte traversiere (treble transverse flute) is translated as "Top view of the transverse flute".

figs 9 & 10 Diderot's Flûte d'accord is translated as "Double flageolet", which misses the point of the d'accord, which is that it plays in fixed and constant chords, unlike the English double flageolet.

fig.27, Diderot's Ton is translated as "Swanee Whistle"! It is, of course, a pitch-pipe and, to make this even more obvious, the piston has on it the lines to mark the different pitches and, beside them, the note names.

Plate IX

fig.39, There is again a puzzled footnote referring back to Plate VIII, fig.3, and again the French text is clear: Flûte traversiere à bec. Such instruments were made for the beginner, for the incompetent amateur, and possibly for the soldier, and to this day one can buy whistle mouthpieces to fit over the head of a flute or a fife.

fig.53, Tenon in this case should be translated as Saddle, not "Hinge".

fig.54, Key-head is probably better for Soupape than "pad".

Plate XI

fig.4, Sourdine should be translated Mute Violin and not "Mute (or mute violin)"; in English we say Mute violin; in French they Sourdine and imply the violon.

Plate XII

fig.16, for "viol" read violin; Diderot clearly says violon.

Plate XIII

fig.38, This looks more like part of the purfling equipment (though badly drawn), as the French text says, than it does a "die for drawing thin wire strings", as the English says.

Plate XIV

fig.M, for "quill" read pin. Frank Hubbard (his pl.XL) translates it as Pivot.

Plate XV

fig.2, For "Construction of the case" read Bracing of.... . Frank Hubbard translates it (his pl.XXXV) as Framing, and he doubts whether such a method was ever used.

Plate XIX

left hand column:

8 lines from the bottom: for "hooks" better to retain the French crochets.

6 — — - — : for "ration" read ratio.

4 — — - — : for"sixth" read sixteenth (seizieme).

right hand column (ignoring the top two lines which are part of the footnote from the previous column):

line 14, for "A" read F (fa).

line 27, for "As" read Fs (les fa).

After footnote 26 (footnotes inserted into a column of text is an extraordinary idea), the text continues and in

line 1, for "general and diatonic harmony" read tuning.

line 10, for "score" read tuning schema (see the note to pl.XI of the first series on my first page).

line 13, for "played" read plucked (se pince).

line 15, for "soundboard" read soundbox (le corps sonore).

Next page, left hand column, ignoring top line (a footnote again):
line 6, for "harpsichord" read keyboard (clavier).

Description of all the parts....:
line 2, for "table" read soundboard

There must be proper terms for "band" and, on the next line, "button", but I don't know them either. The same applies to "hooks" and "shoes" on line 9.

line 28, for "A" read F again.

line 29, for "thus" read this.

line 31, "button" and "knob" - see comment on line 2 above; also for "bolt" on line 34 and "tangent" on line 36 and "buttons" and "band" 8 & 7 lines from the bottom of the column.

7 lines from the bottom: slot would be better than "groove", since it implies a deeper incision. Also on the 2nd line of the right hand column.

There is a reference at the foot of the right hand column on this page to Timothy Davies as the translator, whereas the title page credits Helen Tullberg as the translator, with technical advice from Mr.Davies. However, this same reference also appears on the title page, leaving us in some doubt as to who did what.

Plate XXII
Penultimate line: for "trable" read treble.

right hand column:
line 9, for "15c" read 15th (15e or quinzième in French).

line 21, for "destined for it" read destined for them.

line 24, for "other parts" read aliquot parts.

line 25, for "7 1/3" read 7 1/5.

line 26, for "14 2/3" read 14 2/5 - the French is clear enough in both cases.

line 31, for "results in" read results from.

line 33, delete the letter "m" by itself before "the note B".

It will thus be clear that there has been some carelessness in the translation and in the proof-reading. But don't let this put you off. The errors are few, and anyway you have the original French and all the plates. As I said before, I only wish that they had also reproduced, with or without any translation, the various articles for which these plates are the illustrations. The plates are undeniably useful by themselves, but they were engraved to illustrate the articles and they were never intended to stand alone; it is as though someone in two hundred years time were to reprint the plates from Grove with the captions, but no text. However, if they were to do so, I suppose that his readers would at least know what we and our instruments looked like, and the result would be far better than nothing.

Review of:

The Diagram Group, Musical Instruments of the World, an illustrated Encyclopedia. Paddington Press ltd, 1976. 320pp, over 4,000 illustrations. £8. (USA: same publisher; Canada: Random House; Australia: Angus & Robertson Pty Ltd).

Jeremy Montagu

This is a very difficult book to review. The idea behind it, to illustrate and describe briefly all the most important instruments in the world, is wonderful. Unfortunately, it doesn't quite succeed. The instruments are there alright, with their pictures and their descriptions, but there are a great many errors and inaccuracies, most of them small ones, but annoying nevertheless and misleading to the general reader. The difficulty is, should the reviewer say how wonderful this book is, and it is wonderful to have all these pictures and I shall use the book constantly while teaching to show instruments that I haven't got in my own collection, or should he say how terrible it is to have all these inaccuracies? If I say it is wonderful, people may buy it and then be misled by the inaccuracies; on the other hand, if I list all the inaccuracies that I have found, people may be put off from buying a book that is nevertheless worth having for the sake of the rest of it. And the maddening thing is that with a little care it is just as easy to get things right as it is to get them wrong; there are many people who could have read it through in draft and corrected it. I am fairly certain that the authors are not organologists and I know, because I also have read them, that they have depended overmuch upon some books which are fairly old and are now out-dated by more recent research.

On the whole, I think that the pictures in the book are so good and so clear, often better than photographs, and almost always exact and precise and never "artists' impressions", and the coverage is so wide, that the good outweighs the bad. There is nobody concerned with instruments who will not learn and benefit from this book and, because it is so good on the whole, I will append a detailed list of the inaccuracies that I have found in the hope that many of my readers will buy it and will annotate their copies.

First, two general grumbles. Many of the illustrations are attributed to specific museums, but far too many are not. Even if the drawings were made from photos supplied by a library, or from books, the source could have been given. Also, it might have been possible to give museum numbers - other books succeed in doing so, and this makes it much easier to investigate further. The other is right in FoMRHI's area, early European instruments. Far too often, the instruments illustrated are modern rproductions rather than originals. If they had chosen reproductions by the best makers this would not have mattered, for they would have been indistinguishable from the originals at this scale, but they haven't; the bass renaissance recorder, for example, has a wholly bogus pair of keys for the upper ring finger and lower index finger, and the baroque treble as well as all the renaissance recorders have typical modern German differential finger-hole diameters; the chalumeaux all have revolting double finger holes for both ring fingers, lower index and lower little fingers, and all of them pierced diagonally at that, instead of side by side as on later oboes. The recorders are not captioned as reproductions; the chalumeaux are captioned as "replicas" which is, if anything, even worse! The only thing that they 'replicate' is the maker's imagination.

page 7 Classification diagram: the grouping of mechanical and electrical instruments together is due to a misunderstanding of Hornbostel and Sachs; what counts is the material which produces the

sound (strings, air, etc) and not the means by which it is generated, nor whether the sound is amplified electronically or not. See below (ref. p.246ff) for further details on this.

p.14, text: What is the evidence for the origination of reed instruments "in the East"? Reed instruments also appear indigenously in the Americas, and no one can say whether European reeds antedate the Asian or vice versa, nor whether the Egyptian might be earlier than either.

diagram: The vessel flute and the multiple flute illustrated both have whistle mouthpieces and are thus in the wrong section; both types exist with and without such mouthpieces.

p.15, "Body shapes": the first appearance of a frequent tautology - "hollow tubes".

"Pitch": supposedly this covers all the aerophones, but much of it is true only of the flutes; it is a good description if only they had said so.

"Tone color"(sic): The cylindrical tube of the clarinet is not "stopped"; it functions in a similar way to the stopped flute tube, but this is because it is a reed-blown cylindrical tube; it would produce no sound at all if it were stopped.

p.18 The drawing of the picco pipe is inaccurate.

p.19 The pipe & tabor seem, from the available evidence, to date from the 13th rather than from the 12th century. Something very odd has happened to the pipe of the pipe & tabor player (who is Provençal, incidentally, and by no means mediaeval).

p.20, fig.3 This South African whistle appears to be of horn, not wood.

p.21 The European ocarina has ten finger holes, not eight; the thumbs also have to cover holes and are counted as fingers in this context.
Whistling pots can be, and are, played by tilting them as well as by blowing them.

p.22 What is the evidence that the "side-blown flutes originated in Asia"?

p.23 Many instruments are shown in use in small, simple drawings, which is an excellent idea, but often the physiognomy of the players is wrong. On this page, by no stretch of the imagination could fig.c be accepted as a Polynesian.

p.28 The renaissance recorders have been referred to above.

p.30 The bass recorder illustrated is English, not Czech. Agreed that it is now in the Prague museum, but it was made by Bressan in London, and in the early 18th century, not the 17th.

The drawings of changes of profile unfortunately show the progress from cheap German modern "renaissance" through cheaper German modern "baroque" to genuine (or good reproduction) baroque and are therefore not in fact a progression.

p.31 The so-called "modern toy flageolet" is a perfectly good modern folk instrument.

p.34 This is as good a place as any to mention that the fact that drawings are on the same page, or even in the same block, should never be regarded as an indication that they are to the same scale. On this page the piccolo is too big and the alto and bass flutes are too small.

p.40 The chalumeaux have been referred to above.

p.41 I am puzzled by the remark that the contrabass clarinet "is sometimes used in Tchaikovsky's 6th symphony" - what for?

p.42 I don't understand why they showed the first shape of bassethorn; agreed that this follows the Eisenmanger drawing (Josef Saam, p. 25) but surely no such instrument could work.

It is not true to say that the basset horn's "part is now often played by the alto clarinet"; the latter lacks the low basset notes and only goes down to written low E instead of C.

The Schunda tárogató was only invented in the late 1890s and therefore it cannot have been used at the première of Tristan in 1865! Nor can the heckelclarina have been used on that occasion, since it dates from the end of the century also. It is, incidentally, a pity that only French is allowed any accents or diacriticals.

p.44 The phorbeia of the aulos-player was a cheek strap or support, and not a "chin strap".

p.46 The drawing of a reed on a pirouette on a staple leaves much to be desired, including accuracy.

Where did they get the idea of a great bass shawm on a stand?

The "renaissance shawms" again are reproductions, but there is nothing to say so.

p.47 This is a baroque racket, not a renaissance one (i.e. conical bore etc).

The deutsche Schalmei was a baroque instrument.

p.48 The drawings of oboe reed making are very nice indeed, except that it is a cor anglais reed.

I am inclined to be suspicious of a "Two-keyed oboe, c.1680" - either it is "reproduction" or the date is wrong or it has lost a key.

p.49 fig.2 is an oboe da caccia, not a cor anglais.

The Moeck reproduction is of a cor anglais or an oboe d'amore, not of an oboe da caccia. This is one of the few reproductions which is attributed to a maker.

p.51 fig.4 is a contrebasse à anche, not a contrabass sarrusophone, which looks quite different and has a totally different key system.

p.52, fig.2 The proportions of the 4-key bassoon are all wrong, a very rare fault in this book.

p.53, text: No bassoon reed has a staple.

p.58 The long trumpet (b) is Tibetan, not Burmese.

p.60 The Celtic karnyx illustrated comes from Denmark, not Britain, and is 2nd-1st century BC, not "1st Century", which suggests AD; it is the usual picture from the Gundestrop cauldron in the Copenhagen National Museum.

p.62 fig.3 is a key bugle, not a key trumpet; the two instruments were very different.

p.63 The lowest note of the modern trumpet should be F#, not E. These are stated to be written notes, not sounding.

p.64 fig.3 is a very bad reproduction of a baroque trombone.

p.65 "The trombone mouthpiece has changed little during the instrument's development" - only in shape!

"Only with 20th century correcting mechanisms were satisfactory valved trombones produced" - most of the best compensating systems were late 19th century, and the illustration is of an instrument without any compensating tubing.

Writing about the valve trombone, the authors miss the point that it doesn't really sound like a trombone, hence the continued use of the slide instrument.

p.66 The plural of shofar is shofarot (they got the incorrect "shofarim" from Sachs, who should have known better). The shofar is never played with a separate mouthpiece - they have misunderstood Sachs's quotation from the Talmud about one which had its mouthpiece overlaid with metal, and that only applied in the time of the Temple.

p.67 Is fig.5 of buffalo hide? It looks like horn to me, and certainly all those of this type that I've handled have been of horn.

p.68 The little drawing of the corno da caccia being played shows the hand in the bell, which was a later development.

p.69 fig.12 is a trompe de chasse, not a hand horn.

It is not true that "Players became very skilled at rapidly changing crooks" - see the Eroica. It was always accepted that one allowed time for this; the Wagner parts were not intended to be played as marked - they are valve horn parts, written as imitation hand horn parts to make the tonality clear to the player and to to the conductor.

p.70 It is not true that the invention of the double horn "meant that at last the horn could take its place as one of the truly melodic instruments of the orchestra"; this was true as soon as valves were invented and in fact, with the hand horn, even earlier.

It is the length of the tubing of the F horn, not its width, that makes the high notes difficult to play; the B^{b} horn is easier because it is shorter - it must be the same width because it uses the same tubing!

Wagner tubas are not played "with a horn-like mouthpiece" but with a horn mouthpiece.

p.72 fig.1 is a poor modern straight cornett, not a mute cornett.

fig.2 is a poor modern tenor, not a treble cornett.

fig.3 is a poor modern serpent; the early instrument had no keys.

The serpent was not held as in the small drawing. This is the worst page so far.

p.73 The key bugle was extremely popular, and C.R.Day was still writing enthusiastically about it in 1890 (R.M.E.Catalogue).

p.74 fig.1 shows a Russian bassoon (ophybaryton or upright serpent), not a bass horn, and it is made of wood, not of metal.

fig.4 has the wrong shape of bell and the wrong type of valve. It is a poor example to choose, since it was only on this model that Sax tried to combine valves and keys.

p.75 The euphonium is common in Britain as well as in the USA.

fig.6: for "tuben" (a plural form) read Wagner tuba.

p.78 The diagram of how a mouthorgan reed works is very clear, but misleading in that the reed is in fact at the bottom of the pipe, inside the wind-chamber, and not at the top.

fig.4 has a Chinese mouthpipe rather than a Japanese - it's too long. Both figs.3 & 4 omit the gap in the pipes for the right forefinger, which has to stop holes on the inner side of the circle.

p.83 The drawings showing "pumping the bellows of the regal" look as though one hand is pressing down; the whole point of the lead weight is that one does not press down - the weight is calculated to ensure a sufficient and constant air pressure, so that one only has to lift up and let go.

p.91 It is misleading to say "as with the musical saw, two objects are rubbed together"; the bow is not an object in this sense of co-equal friction.

p.97 Not all sistra had jingling metal discs; cf. figs.1 & 2 which have not.

The Javanese anklung is always played in groups - each rattle is tuned to one pitch of the scale.

p.98 fig.4 is a sistrum, rather than a jingle (the nut shells slide on the frame) and it is a lure to attract sharks, not a fish-hook.

p.99 Most of their "small metal bells" are pellet bells (i.e. rattles) and not true bells.

p.100 Pellet bells and clapper bells (true bells) are grouped together here, despite the nominal adherence to Hornbostel and Sachs, who firmly separate them.

p.101 fig.5 has six chambers, not three, as can be seen in the picture, which shows three above and three below.

fig.7 shows quite the wrong aperture; from below it should look like:  and not like: 

p.104 The little picture of the temple bell being struck is all wrong; the bell is too small relative to everything else, and the beam, which is usually cylindrical rather than square-section, is going to hit it in the wrong place.

p.106 The flat bell-plate, third from the top on the left, is Burmese and not Indian.

There are <u>no</u> gongs other than the Ethiopian in Africa.

I suspect the bottom left hand instrument of being a votive model bell, rather than a gong.

p.108 The top figure shows the gong ageng and the gong suwukan.

The bonang is tuned to the notes of the scale - there is no such thing as a "diatonic scale" in that culture since there is no chromatic scale. Bonangs are tuned to either pélog or sléndro.

p.109 It is silly to say: "although not deliberately tuned, each gong produces a different note of distinct pitch"; both the tuning and the pulsation rate are the result of deliberate choice by the customer and great manufacturing skill by the maker.

p.111, fig.a The ping-pong pan is drawn with too shallow a rim on the main plate; the figure playing it above is correct, as is line drawing a on the opposite page.

p.113 How does the water help "to sustain the tone" of the jaltarang? The normal effect of over-filling the bowls, as can be seen in the picture, is to deaden the tone.

The description of the New Guinea water drum is misleading.

p.114 The 'bridge' across the slit of fig.2 should be divided similarly to fig.3.

p.116 The New Hebrides slit drums are more usually cut down in the forest, carved and carried to the dancing ground and set up there, rather than carved from a standing tree trunk and left in situ.

p.117 The Andaman Island dancing shields are stamped on by the player.

p.118 The acoustics of xylophone bars is reversed here: paring wood from under the centre of the bar lowers the pitch; the thicker the bar the higher the pitch. I have not experimented with varying density, but my impression is the denser the higher.

p.119 It might be fair to point out that the South African mbila made with tin can resonators is an expatriate mine-worker's substitute for the proper instrument; in Moçambique, where this type comes from, gourds are used and are precisely graded in size for maximum resonance, and the proper wood is used for the bars instead of the floor boards shown here. The tuning of the proper instruments is also very precise.

p.120 It is not true that S.E.Asian xylophones are "more accurately tuned than most African xylophones"; both are usually much more accurately tuned than the European school children's instruments shown on the same page!

p.122 The sarons are used to decorate the melody, rather than to "provide" it.

p.124 Technique (a) of cymbal playing will break them.

p.127 The Hawaiian pu'ili (not usually "pu-ilu") are played by striking the shoulders or the other arm, not "the other hand" because that is occupied with holding the other instrument - they are played in pairs.

p.133 The picture showing the sansa being played is quite wrong; the description is correct. The fingers should be below the instrument so that the thumbs and forefingers can reach the reeds.

p.134 In the text the authors have forgotten the Middle Ages, when percussion was also used.

The picture of the man playing the tubular bells is wrong; as correctly stated in the description, they are struck at or near the top of the tube.

The glockenspiel is played with very hard beaters, harder than those used on the xylophone, not "moderately hard".

p.135 Xylorimbas are smaller than marimbas, not larger; they are a cross between the xylophone and the marimba. The picture of the marimba is misleading in that the bars are drawn too thick; the main distinction between xylophone and marimba is that the marimba has thinner and wider bars than the xylophone.

p.136 The triangle's popularity goes back further than 200 years.

p.140 The frame of the frame drum is not necessarily "light"; some are extremely heavy and very thick.

p.141 Skin attachment: combinations of c & d are found. A further method is lapping on a hoop and holding with tension screws, and this is the normal method in Europe today; hoop-lapping combined with a rope lacing was used throughout Europe in earlier times and in many other parts of the world.

Tuning: something has gone very wrong with the lacing pattern of fig.a - one of the very few drawings that has gone badly wrong. A further method of tuning, which often gets forgotten, is by heat; the drum is held near a fire until the desired pitch is achieved.

Only some friction drums - not "most" - are sounded by a stick piercing the skin; svsreal other methods are used, such as the skin tied round the end of the stick to form a pocket. The picture of the friction drum being played is by an unusual method; more often the hand moves up and down on the stick or, if the stick does pierce the skin, the stick is pushed up and down.

p.143 If "the Russian tumyr is single-headed", why has it a flesh-hoop on each end?

fig.b: cylindrical means in the shape of a cylinder, i.e. circular in cross-section, not triangular like this.

p.144 All the drums in the top block are kettle drums, not cylindrical or conical drums; they all have closed shells (vessels). The description of the tabla is wrong - both are kettle drums.

fig.2 in the same block almost certainly comes from North Africa, probably Morocco (both of my pairs do) and not from India.

p.151 centre group: 1 & 2 certainly, and probably 3, are kettle drums; the fact that they have human feet below a closed vessel does not convert them into"footed drums"; this is decoration rather than function.

p.152 The two top drums are goblet drums, not long drums.

The Chinese gentleman is playing a Burmese drum.

fig.2 at the bottom "is similar in shape to the Middle Eastern goblet drum" because it is a goblet drum; it also is Burmese and not Indian.

p.154 top row: fig.1 is a rattle drum with seeds inside it.

bottom row: fig.4 is twisted, not shaken, in playing.

p.157 bottom lot: fig.1 is not Yugoslav; if I remember rightly it is Persian or Afghan. Fig.2 is Turkish.

p.158 bottom: the 'crown' is a fine-tuning device; the basic tuning is done by the rods, which are controlled by the pedal.

p.160 The "tabor player" is the Antwerp civic side-drummer - Jimmy Blades, whose book this is taken from, was wrong on this one.

The "tabor" is an Indian dholuk.

p.161 The flûte eunuche was played by singing into the large hole in the side, not into "one of the apertures in the cap".

p.164 One cannot contrast "simple zithers" and "board zithers"; some board zithers are simple, and some non-board zithers are complex.

p.166 A fourth method of sounding the musical bow is by blowing, by human breath in South Africa and by the wind in Asia.

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fig.3 has a tuning peg, which is a considerable "musical refinement".

Bichordal musical bows are normal in Polynesia, not "unusual".

fig.a at the bottom: very few, if any, African musical bows are plucked with the finger; most are tapped with a straw or light stick.

p.167 There is no "extra effect" gained by holding the resonator against the body; it is the same effect as holding the bow to the mouth - the selective resonance of the overtones of the fundamental.

fig.3 has its resonator upside down; it should be below the bow stave and not touching the string.

p.169 The bridge of the crwth is at the wrong angle (as usual) and the sound-hole in which one of the feet of the bridge is placed is missing.

p.173 The Liberian instrument at the bottom is a frame zither, not a harp.

fig.7 is an arched harp, not a bow harp.

p.174 In their short history of the harp, the authors have forgotten the Cycladic frame harps and also the later Greek frame harps illustrated on pots.

fig.1 is a model of a harp, not a real instrument.

p.175 The "Brian Boru harp" dates from the 14th century, not the 11th, and is not believed by anybody today "to have belonged to this famous Irish ruler".

The diatonic harp was not the orchestral instrument of the 17th and 18th centuries; it was the triple harp which filled this rôle before the invention of the hook harp and pedal harp.

p.179 figs.5, 6 & 7 are all fairly inaccurate, mostly in their proportions.

p.180 fig.3 has wrong neck:body proportions.

fig.2 below: it seems wrong to choose an 8th century instrument, unique in shape and other details, to illustrate the biwa.

p.181 Since the surbahar is considerably bigger than the sitar, it is a pity to show it as smaller.

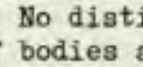
The ivory bridge of the tambura is not adjustable for tuning; that is what the pegs and the beads are for.

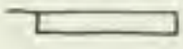
p.183 The san hsien has the wrong shape of body.

p.185 fig.1: "the lute with the wide neck and 20 strings" does not date from the 16th century; maybe the body does, but that's all.

p.187 The small drawing of the chitarrone, meant to show comparative proportions, has far too short a neck, and why the kink in it?

p.188 The Neapolitan mandolin was not the classical instrument of the 18th century. None of the Neapolitan mandolins illustrated have the characteristic 'broken' belly.

p.190 figs.5 & 6 are guitars (akin to the English or Portuguese guitars) and not citterns. No distinction is made here between the citterns with  bodies and  necks, and the guitars with

 bodies and  necks.

p.191 top: fig.3 is probably a stage prop; fig.4 is a Hamburg cittern.

bottom: fig.3 is claimed as 15th century, not 16th, by Schlosser.

p.192 It is not true that from the 17th century the guitar's "appeal has never waned".

The authors might point out that the Warwick Castle gittern is not in its original state.

The guitar, as well as the chitarra battente, often "had a deep body and vaulted back..." It is not by body shape that they can be differentiated but by stringing.

p.193 fig.4 is a zither on a guitar-like body.

The "walking-stick guitar" is also a zither - the high frets are on the wrong side for a guitar.

p.194 It is misleading to say that "the classical or Spanish guitar has changed little since the 16th century" - the changes have been about as great as those of the flute, i.e. in body shape, general design, mechanism and sound produced.

p.195 A small drawing shows "the location of the position markers on the guitar neck" - why not say what they mean?

p.196 bottom: the Chinese "guitar-banjo" has only three strings because it is a san hsien-guitar and not a banjo-guitar.

p.198 One can hardly call the 12th century gentleman a "viol player".

The viol bow was not "broader than the modern violin bow".

p.199 The lyra viol was not "tuned like the lira da braccio". It did not play "the second treble part".

p.201 If the tromba marina was played "by lightly touching the string with the left hand", why show it bowed with the left hand and touched with the right?

p.203 Who suggests that the spike fiddle is "thought to have originated in Persia"? The distribution is far wider than that would suggest and nobody would try to connect the Chinese and West African forms with the Middle Eastern.

p.204 Sarindas don't often have sympathetic strings, and when they do, the strings don't all cross the top surface of the bridge. On the other hand, the sarangi <u>does</u> usually have such strings, unlike the one illustrated here, which has the pegs and the holes for them but not the strings.

p.206 fig.1 has the bridge in the wrong place and is missing the sound post, which should support one foot of the bridge while standing in one of the sound holes.

fig.3 should be wider in the body than fig.1, instead of the same.

p.207 The phonofiddle (top, fig.1) is by no means confined to the North of England.

The lower fig.2 looks more like a Chanot derivative than a hybrid guitar-violin.

p.208 A very poor lot of drawings; there are many better early fiddles.

It is rash to say of the strings "of which one was a drone"; perhaps it was, but not certainly and not always.

If the thumb was used to tauten the bow hair, it would have been by pressing it towards the stick and not "away from the bow".

p.210 The violin emerged before, not "around 1550", and had initially three strings, not four.

The pictures of early bows are very bad.

p.211 There isn't much point in showing a modern violin to contrast with the Strad on the opposite page, since the Strad has been completely modernised, and the only differences are those between two modern violins by two different makers.

In pizzicato, the strings are plucked by the finger, not "between the thumb and forefinger".

The mute inhibits the vibration of the bridge, not of the strings.

p.212 The later Mozart and Haydn quartets are not "the first pieces in which the viola had an interesting and often difficult part to play" - what about Brandenburgs 3 and 6, to name only two?

p.213 Why has the "18th century cellist" got a modern tail-spike?

The cello piccolo is drawn much too small against the cello.

p.214 The double bass no more developed from the violone than the violin from the viol. Both existed in their own right.

p.216 There is nothing to indicate that fig.1 is less than a quarter the size of fig.2.

fig.3 is a board zither, not a trough zither.

p.217 The valiha comes from Madagascar (noun) and is Malagasy (adjective).

p.218 The raft zither with rattles usually has them in a basket of woven leaf at the back of the instrument; how did they get them into the tubes of this one, especially as the tubes are usually of a species of reed with a fairly solid pith filling the tube?

p.219 fig.a is a North Indian stick zither, as described; fig.b is a South Indian lute. Both are called viña, but there is an organological difference between them.

On no instrument are "the strings stopped with a .... plectrum"; the plectrum is for plucking - hence its name.

p.220 Some long zithers are bowed.

p.221 If fig.3 has frets like this, it can't correspond to the Chinese ch'in, except in the sociological sense in which the Japanese koto corresponds to the European piano.

The frets are wrong on the Borneo zither (fig.1).

p.222-227 Throughout these pages, alter board zither to read box zither (this is why they went wrong on p.216).

To say "the Middle Eastern qanun .... reached Europe in the 11th century" is a bit optimistic; 12th-13th is more likely.

fig.d: the ala boemica was really only popular in Eastern Europe; examples in the west are very rare if they exist at all.

The "late 17th century psaltery" looks to me like a dulcimer.

p.224 fig.4: the tambourin de Béarn is never pegged like this, nor are the strings ever arranged in courses. Where are the buzzers?

p.226 If the santir and the chang have "individual movable bridges", why show them with common bar bridges?

The evidence for the dulcimer in Europe in the 11th century rests

on one debatable carving; thereafter there is a gap of about four centuries. It has been suggested (by me and others) and disputed (by John Leach and others) that the dulcimer went from Europe to the Middle East in the 15th or 16th centuries.

p.227 The proportions are wrong in fig.1 and the stringing is haywire in fig.2 (and the body shape is wrong); why show both from the back?

p.230 It's a bit silly saying that "the first succesful examples [of the harpsichord] were made in Italy in the 1500s" with Arnault de Zwolle's drawing of c.1440 beside it! Nobody has ever suggested that he made it up.

The bridge and jack diagram has a 16', which was hardly "a typical 18th century harpsichord". It might be 8', 4' and 2', but that wasn't typical either.

The lute stop was not plucked by the "tip of the plectrum"; it was the position of the plectrum relative to the string length, very close to the nut, and not the plectrum length, that made the difference of tone.

p.231 Isn't it rash to say that "the clavichord far exceeded the harpsichord in popularity in 18th century Germany"?

The diagram of the manuals is very odd indeed, with one manual a fourth away from the other in the bass and a fifth away in the treble, and a different number of keys on each.

p.234 When the Italians referred to the spinet in the 16th century, they meant what northern Europe called the virginals, with string arrangement as in fig.a.

The string arrangement in fig.b is displaced a bit towards the bass.

The Ruckers illustrated is a muselaar and thus is not typical of the virginals.

p.235 The octave virginals (child) only fits in the drawer when not in use.

The middle instrument is also a virginals (string plan a).

p.237 J.C.Bach is always said to have been the first to popularise the piano in England, but surely he didn't give "the first public solo piano performance" (anywhere, understood from the context).

p.240 stringing: the bass strings are copper-wound to increase their mass; any increase of resonance is the result of the greater efficiency derived from the shorter length and so on that the greater mass allows.

p.241 None of the diagrams shows "a concert grand"; all are too short in relation to their width.

p.246 There is complete confusion here as to what is meant by mechanical; the fact that there are keys and trackers, however complex, does not mean that a carillon is any more mechanical than a piano. Mechanical means that the instrument is played by a machine, rather than by a person. Thus, the barrel-played carillon on this page is mechanical.

p.248 Nor are any of the instruments on this page mechanical, unlike the two automatons on the opposite page. A wheel is no more mechanical than a bow, nor tangents than, for instance, piano hammers.

bottom: the tangents on a many-gurdy move sideways; they don't "rise and stop the strings".

p.249 The geigenwerk was not "a mechanical harpsichord". a)it wasn't a harpsichord and b) it wasn't mechanical.

Does the Link piano have a mandolin in it (there isn't one visible) or was it a mandolin stop, i.e. a rapid reiteration on the piano strings?

p.254 The electric guitar is still a string instrument, electronically amplified.

p.257 So is the electric violin. The electric saxophone is still a wind instrument, and the vibraphone an idiophone (and sometimes still operated by clockwork at that, though electrical drive for the spindles is almost universal today; it is not usually electronically amplified). The electric harpsichord is simply the usual nasty modern instrument, pre Boston school revival of authenticity, with so little tone that it can't be heard without a microphone; we had them in England, too, but I don't suppose that anybody has bothered to preserve one in a museum.

The vibraphone resembles the xylophone in shape but it has metal bars instead of wood.

p.258 These <u>are</u> electronic instruments.

p.260 Nowadays the ondes seem usually to have a gong built into the speaker, instead of the fan of strings.

p.264ff The use of the words "folk" and "simple" is unpleasant and often inaccurate. The first two "simple horns" are compound, not simple, and the "folk shawm" is a professional musician's instrument. This applies over the next twenty or so pages, and on many earlier pages also.

p.271 Why draw the two rana-çrifgas (top line, figs.7) upside down? They are played bell up.

p.285 It is not true to say that "around 1750 the continuo was abandoned"; we may have abandoned it for music after that date, but there is a good deal of evidence that it was used into the 1800s. Salomon announced that "Mr.Haydn will preside at the pianoforte" in the London concerts, and presumably he played a continuo part, and there are certainly a number of Beethoven figured bass parts.

p.292 chronological column: the double bass came in as soon as the violin family was established. The clarinet should be added at about the same point as the trombone.

table of instruments: Baroque orchestras used oboi d'amore and da caccia and bassoons in pairs.

p.300 Not all these instruments are Japanese. fig.2 is Siamese and figs.3 and 7 are Chinese. The group at the bottom are correct and the different proportions of the biwa from fig.7 are very obvious.

p.301 The rebab player is not necessarily the leader of the gamelan; he may be the principal soloist, when he is present, which is by no means always, but the leader or director is usually the drummer.

p.304ff A curiously random list of personalities.

p.304 Were the Amati noble? Boyden is certainly doubtful, to say the least, that Andrea Amati could have been the instrument's inventor.

p.308 Surely Kirckmann used the nag's head swell; it was Shudi whose harpsichords had the Venetian swell.

p.309 Can one credit the Neuschel family with the development of the trombone? I think that it would be rash to be so definite. But it is a pity not to say that trombone player illustrated was also one of the family; he comes from the Triumph of Maximilian, where he is named as Neyschl.

p.310 The saxophone was not developed as an attempt to improve the bass clarinet, but to replace the oboe in the military band.

p.315 The Galpin Society is not the publisher of Izikowitz's book. It was I, while Honorary Secretary of the Society, who recommended to SR Reprints that it was worth doing so, along with a number of other books that have never appeared, but it was they who published it.

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Despite this enormous list of corrections, I still think that this book is worth having; indeed, that is why I have gone to all this trouble. I hope that the result will be useful to my readers and I hope that they, if they find that they have benefited from it, will add to it in future FoMRHI Communications so that I, and others, may benefit from their knowledge.

It is a daunting task to attempt to write a book of this size and coverage and it should be borne in mind that I have found it necessary to comment on well under 10% of the entries. With 4,000 illustrations, the book is well worth £8 for the other 90%.

FoMRHI Com. 10a

COMMENT on Com. 10 Attitudes to Musical Instrument Conservation and Restoration by G. Grant O'Brien. John Barnes

I should like to make some suggestions concerning the making of new parts for restorations which supplement the ideas of Com. 10.

Certain kinds of object, for instance pottery, are restored so that a museum visitor can distinguish at a glance the new from the old parts. When restoring a musical instrument the aim should rather be to match the new parts to the old sufficiently closely that they are inconspicuous visually or by touch, but reveal their origin and date on close examination. The restorer should not use antique materials or parts from other old instruments if this could be confusing to a future observer.

New parts are usually required because the old ones are missing or damaged beyond serviceable repair. However, there are occasions when the making of new parts will enable the restorer to set aside for storage some of the old ones even when they are serviceable. This is an advantage if these old parts contain interesting ephemera which would not completely survive removal from the parts or would be damaged by future use. The essential conditions for using this technique of preservative replacement are that the old parts can be removed without damage and stored at least as safely as the rest of the instrument without loss of identifying information. If the instrument belongs to a well-organised museum these conditions will usually be satisfied.

Preservative replacement applies particularly to the restoration of keyboard-instrument actions, and it was used in 1968 to preserve some soft leather plectra of unknown origin in the Taskin of 1769 in the Russell Collection, by the expedient of making a duplicate set of jacks for one register. At the time this was felt to solve an isolated problem but it is now thought to embody a principle of wider application.

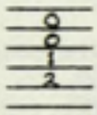
I would also like strongly to recommend to restorers that they consult their colleagues for a second opinion whenever they are faced with a complicated restoration. A summary of the situation and the proposed solution will often elicit useful suggestions, as I know from experience both of seeking and giving such help. It can also be conducive to the quality of a restoration if a consultant is appointed when the restoration is commissioned. A situation is thereby encouraged in which a restorer refers to the consultant, which would usually be another restorer or an organologist, more freely and more frequently than he would feel able to do on his own initiative with his colleagues in general.

E Segerman, D Abbott

In response to Donald Gill's comments:

1. Yes, why not? We don't know enough about vihuelas to prejudge the little data we have.
2. Valdarabano called the higher vihuela part in his book of duets the "discante". We may just have to agree to disagree.
3. In Comm 39 we stated that according to Bermudo the guitar would be tuned with an a' first course, and considering our reading of his description of the vihuela-discant-guitar trio, the first courses of the other two would be d' and g' respectively. Gill reads Bermudo as indicating that the vihuela would be in g' and the discant presumably in c''. The relevant passage (Chapter lxix Fourth Book is as follows in translation:
" You may tune a discant a diatessaron (or fourth) higher than the vihuela so that the sixth (course) of the discant agrees with the fifth of the vihuela, or in many other ways, and the guitar an octave with the vihuela, which comes with the fifth of the guitar (tuned with) the second fret of the fourth string on the vihuela".
Gill's point is that the "fifth of the guitar" would have been the name for the g or 4th course (counting from the treble as we and Bermudo do) and this would be a tone higher than the fourth course (f) on a vihuela tuned with g' first course. We cannot see how this interpretation can be reconciled with the statement "the guitar an octave with the vihuela". Also in Chapter lxv Bermudo stated "Guitars commonly have four strings (courses). The lowest string is generally called fifth (but) I shall call it fourth", and true to his word he consistently used the word "fourth" for the lowest course of the four-course guitar, and used the word "fifth" only when discussing the five-course guitar and in the passage in question. In our interpretation the 4 courses of the guitar are an octave higher than the middle 4 courses of the vihuela with highest string at d'. Note Bermudo s famous statement "The new guitar has all four strings in the tuning and disposition of the four of the common vihuela when you have taken away the sixth and the first" Then the second fret of the vihuela's fourth string is d which is a reasonable pitch for the fifth string of a five-course guitar - a fourth below the 4th course. We are unhappy with having to assume that Bermudo was referring to a 5-course guitar (an untypical instrument according to him) in this context, but Gill's interpretation of the unusual use of the phrase "fifth of the guitar" needs to assume that he was both inconsistent and in error with respect to his octaves statement. According to our philosophy of historical research which could be called the 'principle of minimum disbelief', if all other factors being essentially equal, the interpretation to be preferred is one which assumes the fewest errors in the original sources.
4. Gill is perfectly right. I checked with my translator who is generally most competent, who checked again with Bermudo: it was a silly slip. So ten frets it is, which makes the Paris vihuela which allows only 9 suspicious. Might it originally have had a longer neck which was shortened when it was used as a guitar? The pattern of wood blocks that the neck is made up of is not completely consistent. If instruments with its size of body had a neck usually two frets longer (string length 90 cm) then all fits neatly in place. Its first course would then have been tuned to c' at a tone-low pitch standard, a fifth below the descant in g' (to play the Valdarrabano duet music with the widest pitch difference between the two vihuelas), all vihuelas being distincly larger than the guitar with first course in a' (or higher). Milan's usual assumption that his highest course was in a'

was probably because, as Mark Lindley has convincingly demonstrated, Milan had his frets in a mean-tone temperament. In this temperament an a' tuning assumption only makes an E major chord bad using the first fret for the g-sharp

( not used,  used instead.)

In a g' tuning assumption the first fret would be in a different position for the E-flat and B-flat than for the G sharp, F-sharp and C-sharp, and since it is the most difficult fret to keep adjusting for pieces in different keys, it would have been put in an equal tempered compromise position. Though this was good enough for most others (equal tempered fretting was more usual than mean tone) it was not good enough for Milan.

5 No arguments.

6 Gill must be correct here. We originally got the information from him during a conversation and must have remembered it wrongly.

FoMRHI COM. 44c.

DETAILED COMMENTS ON "THE WORLD OF MEDIEVAL AND RENAISSANCE MUSICAL INSTRUMENTS" BY JEREMY MONTAGU, PART I

E Segerman

In this installment I shall discuss the contentious points in the general and stringed instrument sections of the first two of the four chapters of this insightful book. The same approach and notation as in 44a and b is used.

1.13.1,2 The way that the evolution of the lyre into the long-necked proto-citole is expressed in 13.1 does not seem to allow for the parallel development of instruments more closely resembling the original lyre as given in 13.2. It is not clear whether JM is distinguishing between the kithara and the lyre on the starting points in each section.

2.13.1 For 'gittern' read 'citole'

3.15.1,2 I would have thought that the plucked instrument of plate 5 had enough of the essential features of the fiddle to be called one (the name was used before the introduction of bowing)

4.15.1,2 I have not seen illustrations of nor seen mention by others of the existance of rebec-shaped plucked instruments north of Pyrenees before bowing started and if this is a new observation I find it most frustrating, with the style of presentation avoiding references, not being able to follow this one up.

5.19.2 As I understand it the troubadours and trouveres were aristocratic poets and probably composers, but that generally they had the professional musicians, jongleurs, perform their works for them, thus there is no exception to the rule stated that aristocrats don't demean themselves by publicly playing music.

6.23.1 Is not the word "identical" relating Cantigas instruments to currently played instruments outside of Europe a bit too strong?

7.23.2 Caption to Plate 10 read 'citole' for 'guitar' and on Plate 11 'citole' may be right but I have my doubts (see 18.29.1).

8.24.2 Many tailpieces of the period look like they might be made of leather.

9.24.2 I hadn't noticed that a round central rose preceded D-holes on fiddles; my complaint here is that of my point 4.15.1,2.

10.24.2 As exemplified by Pl. 12 and I, the bow hold was usually such as not
27.1 to be able to control the tension of the bow. There is absolutely no need to dream up ways to tension the hair (our practical experience confirms the iconographic evidence that bows work keeping the same tension on all the time).

11.25.2 The instrument in the upper central region of the lower panel of Plate II is not a citole but a standard 7 peg guitar. The name Giga on the right probably refers to it (Wright GSJ.XXX (1977) gives other evidence of the occasional equivalence between the names 'Giga' and 'gytterne').

12.25.2 The instrument on the lower right of Plate III seems to me to be either a citole or plucked fiddle. Its sides look like they border a flat back to me. Compare a woodcut of one of those playing with a lute on p.18, Buchner, 2nd ed.

13.27.1 My view of fiddle bridges and the use of the bourdon string is given in Comm 50 and 51. Baines's view on the use of the word 'drone' in this context (Comm 58) needs to be seriously considered.

14.27.2 In our experience with making medieval fiddles we find that it is easier to carve the pegdisk neck and body from on piece than to carve the parts separately and to align and joint them together.

15.28.2 My view on staying in the first position is given in Comm 51.

16.28.1 Caption to Plate 14 read 'guitars' for 'mandoras'. Caption to plate 15, see 7.23.2 and 18,29.1.

17.28.2 Delete 'Mandore' in the title.

18.29.1 I prefer to assume that the definition of the viola given by Tinctoris (ca. 1490) pertains at this early date, ie. that the flat back is the necessary criterion and that the waist is optional. This of course is also the fiddle. The right-hand figure in Plate 15 could be playing a vihuela peñola (5 strings is a good number for a fiddle) and the right hand figure in Plate 11 could be playing a vihuela da mano (ie. is 3 strings). This is consistent with the association of these instruments with those labelled 'viola' in Plates II and III as JM does in the category 'pear-shaped plucked instrument' popular in Europe outside the Iberian Peninsula, but he labels Plate 11 and 15 differently.

19.29.1 The discussion of citole and gittern (I wonder if he uses this interchangeably with 'guitar' or makes a distinction that is not stated) is to be modified in the light of Wright, GSJ.XXX.

20.29.2 I doubt very much whether metal strings were generally used at higher tension than gut in this period. Metal psaltry strings needed to be lightly plucked (see Comm. 14. p.37) as Barley (1596) said for the orphareon. An important 14th century source (see Comm 14, p. 41) recommends gut strings for all of the instruments discussed in this section. Thus the discussion about high-tension metal strings is probably irrelevant on these two counts. It might be relevant in the 16th and 17th centuries but then it turns out that factors other than strength of bridge glueing are of greater importance.

21.29.2 I am sure that insuring intonation (on melodies for an inexperienced player and on multiple stopping for the experienced player) is a more important motivation for having frets than the tone-colour difference. As Ganassi stated, multiple stopping was common practice on the Renaissance viol.

22.30.1 I've heard that the rhythmically jerky style of hurdy-gurdy playing was introduced in the 18th century. Is there earlier evidence?

23.30.2 With reference to the symphony on Plate V any statement that an early source is in error should be made with caution. It can be to a player's advantage to set up his instrument in an unusual way that looks impossible to his audience. It is easy to imagine various ways in which this could have been accomplished.

24.30.2 For 'Gittern' read 'Citole'. See Report on FoMRHI Seminar 2 (this issue) for a more comprehensive discussion.

25.31.1 It was surely the original violin bridge that survived, not the citole bridge. It is a pity that Plate 19 shows so little of it.

26.31.2 I don't understand (and wonder whether anyone else does) the intended relationship between the pairs of players in the Escorial J.b.2 illustrations. That they were standard performing duos seems a bit naive. It is a pity that JM didn't indicate how he knows that Plate 20 shows "a clear illustration of one player accompanying the other".

27.31.2 By the 16th and 17th centuries lute roses were generally carved in the wood of the soundboard. Some painting of 15th century lutes show roses that couldn't have been made this way. I know of no tradition in the history of the lute before late baroque in which inserted roses was clearly the norm.

28.31.2 Caption Plate 17 read 'citole' for 'gittern'.

29.32.1 Caption Plate 18, to me this looks like a plucked fiddle but it might be a citole.

30.33.2 Caption Plate 19 read 'citole' for 'gittern'.

31.34.1 & 2 I doubt whether these blobs at the bottom of each string are brays. The date is much earlier than any other depictions of harps with brays. I think they are the brass shoes at the bottom of each string that Irish harps usually had.

32.35.1 The design of a psaltry is inherently so strong that I doubt whether any stringing the player might devise would defeat the makers ability to make a stable instrument for.

33.35.1 When discussing various scaling and stringing regimes there are many factors other than those in Mersenne's law which affect choice. For instance, Pythagorean scaling (double the length for each octave) as is used on the harpsichord and piano is primarily for keeping the ratio of string diameter to length minimal while keeping up the tension needed to shift the soundboard adequately. This ratio is directly related to string inharmonicity; the smaller the ratio the purer the note since the harmonics are more in tune with each other and the fundemental.

34.35.1 I do not know what "avoiding distortion" means when associated with equal tension. I think I do know that strings of fiddles and lutes of the period in question varied only in string mass and not material. Also thin treble strings and heavy bass strings on instruments with Pythagorean scaling necessarily means <u>unequal</u> tension.

35.35.1 It is unwarranted to assume that the earlier shapes of psaltries "were not practicable" for the musical purpose they were intended. If this were so they would have not been used and we would see no illustrations of them. It is easy to find better speculations about motivation for changes in instruments.

36.50.1 To this good discussion of variables in musical performance of the written music that we are unable to determine today several other factors should be added: (a) Pitch level usually played at (to know within half and octave would be helpful) (b) Types of scales used (the fretting rarely looks Pythagorean, which is not what the theorists mention) (c) Ornamentation (deviation from the pitch norms and from the written tempo plus added grace notes, etc) (d) possible improvised interludes between verses and variations of interpretation from verse to verse, etc.

37.50.2 The tuning of the stringed instruments is a problem that JM's logic has not solved. It is reasonable to assume diatonic fingering (one finger for each note in the scale) for small instruments and chromatic fingering (one finger per semitone) for large instruments, but this is often violated in the Renaissance and baroque: ie. early bass violins (larger than modern cellos) used diatonic fingering and the small English cittern (string length like that of a small modern viola) used chromatic fingering. Also, re-entrant tunings were much more common then than now, so JM's attempt to guide the modern performer's choice of tunings is oversimplified and can well be misleading. Certainly his statement starting with "The written descriptions indicate that ....." is.

38.50.2 A possible use of the thumb with respect to the fiddle bourdon string that was not mentioned in Comm 51 could be to dampen it when it was out of consonance with whatever else was played on the other strings.

39.50.2 Statements that tuning was arbitrary could erroneously be construed by the reader to imply that pitch level was arbitrary on any particular instrument. The 'highest pitch that the strings will take' instruction in Renaissance and later treatises is mirrored by Aegidius of Zamora (see Comm. 14 p. 41).

40.51.1 Why should a fiddler have any difficulty in accompanying his own singing?

41.51.1 Modern writers need to be careful to avoid stretching the data in attempts to try to justify the modern preference for concerted rather than solo performances. Medieval records are more consistent with performance in tandem rather than together when several musicians were in the same place at the same time. This comment was inspired by JM's comment concerning the trumpet and Plate IV.

ON PREMATURITY OF COMMUNICATION FoMRHI Com. 58a

E Segerman, D Abbott

The 4th point of Anthony Baines in Comm 58 stating that our discussing the article by Wright before its publication was premature was well taken in the light of some of the traditions of arts scholarship. We would like to argue that these particular traditions are inappropriate for the current state of the early music field.

In arts scholarship each scholar is expected to research the various aspects of his chosen area of specialising as thoroughly as possible before publication. When the publication appears, every relevant factor has been deeply considered over all of the time needed to dispel doubts about the chosen interpretation. The paper needs above all, to carry authority, and when it appears, although individual points or even the primary thesis can be challenged by others, the scholar tries to make sure that it is most unlikely that he will ever need to capitulate to these challenges (Wright's paper is of this type).

Such a degree of certainty requires a considerable amount of time. It is also traditional for arts researchers to be soloists (most papers have single authors) so the research can well be slower than co-operative efforts. In most areas of arts scholarship this slowness of communicating research results does not create serious problems. The researchers in a particular field are few, and since they know of each other, if one needs the results of another to continue his own work, he knows whom to contact and usually gets what he needs before formal publication. Meetings of specialist scholars facilitate this informal communication.

This system loses its effectiveness if the field of research is expanding rapidly both in the number of people involved and in the consequent amount of work that is being done. This has recently become the case with early-music and early-instruments research (as it became in the physical sciences after the last war). There are several factors involved in the need for accelerated communication with wide coverage: There is a much greater probability of duplication of work since it has become so difficult to keep in touch comprehensively with who is doing what. Also there is a large amount of effort going into arranging music, developing performing styles and developing instrumental technique as well as a large financial investment going into instruments. Much of this effort and money is potentially at risk of being wasted as the result of research findings. Thus speed of communication is essential to reduce the amount of such possible waste.

The pressure for expanding the range of repertoire and instruments generated by musicians and instrument makers is so great that do-it-yourself poorly researched but attractive efforts can rapidly be widely copied and become modern traditions. If a scholar can offer tentative results of incompleted research these would be much more valid than many of these efforts. If these tentative results are aired, the early-music practitioners will be alerted to issues they may not have considered, and in addition the consequent interaction with other scholars could well approach the ideal authoritative consensus more quickly. If a preview of the results of a thoroughly researched article is offered, as is the case in question here, better yet.

Of course the classical thoroughly-researched authoritative paper is more essential than ever, but we cannot afford to wait till all of the i's are dotted, all of the t's crossed and the busy printers get around to doing the journal before the early-music community finds out what the scholars are doing. An important function of FoMRHI is to provide the quicker communication that is needed.

Publicly presenting information and speculat
fully defend them demands an amount of courage and willingness to admit to error that is not universal amongst scholars. The traditions of the scholarly world assume that scholars are highly aggressive. In the cause of upholding standards it is expected that inferior work will be roundly criticized. Unfortunately this criticism often extends to reported work that is incomplete. Scholars who cringe from criticism and controversy consequently hold back until they feel their positions are impregnable. It would be so much better if we could work together and argue together as friends in search of knowledge, and learn from each other's mistaken insights as well as valid ones.

To get back from this digression to the complaint of prematurity by Baines. We have been trying to imagine the possible bases of his objection "in more senses than one". Could Baines be expecting that readers would be more annoyed by hearing about Wright's conclusions (and our endorsement of them) before being in a position to evaluate their validity (and our judgement) rather than being presented with all together at a later time? Perhaps there are some who prefer to play the scholarship game in this traditional way. But our sympathy extends more to the performer trying to recreate Medieval music and to whom the name of an instrument carries implications of probable tunings. He will not be pleased to learn that he has invested another 8 months in developing a technique and playing style in the wrong tuning. Of course, as Baines implies, it is possible that some critic is in the possession of powerful but obscure historical data that conflicts with and invalidates Wright's conclusions. We believe that the probability of this happening is so low that the risk of misleading the trusting reader is worth taking in the light of the clear value of early publicizing of Wright's conclusions.

We have been trying to imagine what principle we have violated by quoting Wright's conclusions "as gospel" before those who would contest it have their go? When we write we express our own judgements, and make no claim to present the consensus of scholars in the field. This should be particularly clear if we are quoting an article not yet published. Yet if we have inadvertently implied otherwise we need to be more careful in the future.

Have we erred by diluting the impact of the appearance of Wright's article by stealing its thunder beforehand ? It is understandable that the editor of the journal it is published in (GSJ) could be concerned, but advertizing beforehand an important article that appears in the journal could only add to the attention it receives. That journal contains so much of tremendous value and since it appears only annually there is no need to expect it to carry all the news as well as the facts behind the news.

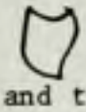
Concerning the other points in Comm 58, Point 3 is a useful contribution and we have no further comments on it. Point 2 involves the question of interpretation of the plural when the word 'bordonus' is consistently used elsewhere in the ms. in the singular referring to the first string. This will be discussed as well as point 1 in the meeting between Page, Baines and the independent Latinist arbiter which has been agreed to and which we hope to have a report on. In point 1 Baines made two little slips that we are sure he would want to be put right. The translation was, as we stated in Comm 50, Page's and not our own (we can't claim to read Latin) and this interpretation of Jerome's second tuning is not original with him either since it appears in many books in print such as Marcuse's Dictionary, Sachs's History of Musical Instruments and van der Straeten's History of the Violin. (Page tells us that it goes back to the beginning of this century). We look forward to the meeting and if necessary (but we doubt it) we shall modify Comm 50.

MEDIEVAL CARVINGS OF MUSICAL INSTRUMENTS IN ST. MARY'S CHURCH, SHREWSBURY

Despite various comprehensive surveys of musical iconography currently being conducted, little information has become generally available, except through certain articles in Galpin Soc. Journ., Early Music, FoMRHI Bulletin etc. This article is intended as a small addition to the list, and (more important) as a plea to other FoMRHI members to make similar contributions. If you know of a church, art gallery, etc., containing musical iconography, make a brief summary of what is there, and send it in to FoMRHI for publication. We should be able to build up a list which tells the enthusiast which places are worth visiting, what they contain, and where to look. Precise identification and description is not essential, though it is advisable to make it clear what you mean by ambiguous terms such as gittern, flute, etc. Give probable date of construction (and possible restoration) if you can.

The carvings in St. Mary's Church, Shrewsbury, are on wooden roof-bosses over the centre of the nave. According to the guide-book, the roof was probably built in 1460-77, was damaged in 1894 when the top of the spire was blown down, but was restored using as much of the original as possible. The bosses are decorated with angels playing the following instruments (going from east to west).

1. Clavichord (illustration in Galpin, Old Eng. Instr., Fig 20).

2. Harp 

3. Pipe and tabor.

4. Fiddle or rebec (round belly, flat round pegboard, 3 strings, 3 pegs).

5. Crowd (Galpin Fig. 12)

6. Lute (belly nearly circular; plucking hand emerges from underneath-side, no plectrum visible).

7. Harp 

8. Bagpipe with two parallel and equal chanters, no drone.

9. ?Shawm (expanding body, slight flare at bell, 6 fingerholes visible, no sign of pirouette).