Elena Dal Cortivo

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FOMRHI Quarterly

FELLOWSHIP OF MAKERS AND RESEARCHERS OF HISTORICAL INSTRUMENTS

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FELLOWSHIP of MAKERS and RESEARCHERS of HISTORICAL INSTRUMENTS

Bulletin 44 **July, 1986**

I've not got it out quite as quickly as I'd hoped because I've had a massive D.Phil to examine, but we're within a week of the hoped-for date, which is better than sometimes.

LOST MEMBER: Malcolm Prior's April Quarterly has come back; does anyone know where he went to from Bartholomew Place?

Since his is the only one that's come back, and since I've had no "where's my Quarterly?" letters (or anyway none since they actually went out, which was very late) I assume that the new and well-revised run of address plates has worked well and that you all got your April Qs safely. Now that the bugs are out of that list, Djilda's job will be much easier.

BACK NUMBERS: I know that many of you have been frustrated because you have not been able to get copies of the Quarterlies that went out of print before you joined. I had a card from Uta Henning the other day to say that *"I am now in the possession of a very efficient copying machine for xeroxes of any kind. Perhaps you could make a note into the next FoMRHI issue saying that anybody who is interested in back nos. no longer available can contact me....I have all nos. right from the beginning, and as long as I don't have to xerox a dozen issues every day, I should like to help out."* So now's your chance; write to her (in the List of Members). She doesn't say how much it will cost, nor whether they'll be single-sided or double, and so on, so you'll have to ask her. At least it means that the early material is available again (as the majority of the Fellows thought it should be).

LIST OF MEMBERS: Another comment of Uta's was why does she find the Boston museum under Boston but the Bayerische Staatsbibliothek not under Munich? Much of the list is irrational in this respect. I tend to put institutions under whatever I normally call them or think of them. Thus I think of the Boston Fine Arts Museum (but the Metropolitan Museum, New York - don't check; they aren't a member), and the Bayerische library, not the Munich Bayerische library. And so that's why they are where they are. She also asks why the separate *museums* section isn't *museums and libraries*. The reason is that museums are a resource for all of us, whereas libraries aren't in that way, and it's useful to know if a museum is a member. When they are, it is to some slight extent an introduction and a link between us which may (no guarantees of course) be a help when we want to handle their instruments.

FURTHER TO: Comm.668: In my review of that issue of JAAMIM I said that I thought an article by John McLennan would be useful to all of us. I got permission to reprint it, and if I hadn't mislaid my copy of the Journal it'd have been in the last Q. I have now found it again, and it should appear in this Q if Eph thinks it printable after I've photocopied it, enlarging it so that it can be reduced again to our format.

Last Quarterly: The size was a surprise to me, and a nasty shock to the Treasurer. Magggie says *"When I said we could probably keep the sub. rate the same for another year, I wasn't anticipating such a bumper April issue. I have just received the bill from Beeprint, and they worked out at £2 each to print, let alone the extra postage. The July and October issues must be smaller if we're not to go overdrawn. We only have about £2150 in the kitty, and will need about £450 of that for postage. The* **printing** *of January and April (excluding members lists) came to about £2100. If July and October are no bigger than this year's January Q we'll be OK, but the subs will have to go up next year after all."* So, this is a preliminary warning; we've mopped up all our reserves and you will have to pay more next year.

Grove Reviews (various Comm.numbers): As John Rawson said in a letter, we look like running this for the next decade; why not? It's so important a work that it justifies the time and effort we put into it. Why don't more of you join in? Once we are sent something for review, it's fair game and open to anyone to make fair comment. We all have our areas of expertise; Eph has been concentrating on some aspects, and I've been stressing others. If you have a speciality and can make useful comments on one or more instruments within that speciality, then please do so. I have had a very nice letter from the editor, Stanley Sadie *"to thank you warmly for the batch of FoMRHI Quarterlies. I am of course very pleased to have them - and you may be sure that they will be given due attention when (if) the time comes for a revised Instrument Grove. Very many thanks for the trouble that you have taken."* So if there are things that could be improved in the description of your instrument, write them up and help your fellow-members now and everyone when (if) there is ever a new edition.

Comms. 701, 719, 720: I am not the only member who is spitting mad about these Comms of Marc Champollion. He wrote to me to rejoin after a lapse, with some queries (which were in the last Bulletin; one I'd had to retype because of some libellous remarks which I left out, but the others were as he sent them). Maggie sent him the back issues that he'd paid for, and he then sent the above Comms direct to Eph, who I am very sorry to say put them in as they were. Several members have written to me to say what I also thought: if Marc doesn't like the way we do things in FoMRHI, he can take a running jump. There is no reason why he should take eight (at a guess; it may be more) pages of the Quarterly to say what anyone else says in one. If his Comms had come to me, they'd have gone straight back for retyping, and perhaps that's why he sent them to Eph; why Eph did not send them back, I don't know. The instructions for contributors are on the back page of the List of Members, and **they apply to Marc Champollion just as much as they do to the rest of us.** I'll quote just one of the several letters I've received on this (several were unprintable, as this was in part; he has really made members angry): *"What I do object to is that FoMRHI printing costs have to be doubled because he sends in his copy in the wrong format. If it's not right -- send it back!". Eph please take note.*

BINDERS FOR THE QUARTERLY: Peter Foster writes:

I mentioned a binder for the Quarterly. I am using the one for BEEGUG Magazine. It will hold about ten issues and costs £3.90 plus p&p (50p for the first one and 30p for subsequent ones). For the complete set of Quarterlies you will need 5 binders , plus a label to cover the Beebug caption on the back. If you get both Bebug and the Quarterly and don't put a label , you're get very confused ! The address is:

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WOOD: John Rawson writes:

As a lot of us use wood I just thought I should draw your attention to the following book:- Trees and Woodland in the British Landscape by Oliver Rackham - Dent & Sons (Archaeology in the Field Series) paperback £4.95. It is mainly about woods (i.e. coppices and pollarding etc) rather than about timber (i.e. trees and plantations) but it gives a very good picture of how trees have been managed in England for the last 500 years. Useful background material if you ever, like I do, have to go out with your saw into the woods, looking for a suitable bit to cut.

QUERIES: Robert Dougan has two questions: ***"What I'm after is the sizes for a cello, and how to make a nyckelharp"***. I've suggested that he should look at some cellos and that there isn't a standard size, and I've referred him to Jan Ling's book on the nyckelharp and to those of you who list it as an interest. If anyone can help him beyond that, please write to him.

Peter Foster says:

I am interested in building a shawm . I wonder if anybody has been successful and could provide some information. It would be most welcome.

NEW PATENT: Joseph O'Kelly is taking out a patent for a new device on the guitar, and has sent me a copy of his press release about it. I've sent it up with this, and if the photos are sufficiently reproducible, you'll find it elsewhere here.

COMPUTERS: John Rawson has sent Just a quick note on Computers:-

Computers are so marvellous to use that clearly everyone who writes anything, stores information, or calculates anything, needs one desperately and is thrilled when they get one. In the last Quarterly about 95% of the text was set on a word processor, and that is a big change from a couple of years ago. People who say now that they are a bad thing can safely be ignored. The cost of machines is falling but is now so low that almost everyone who can afford a typewriter can buy one, and the quality of dot-matrix printers if improving fast. (This was typed on a new Epson LQ800). There are still problems with the compatibility of different systems, and particularly so in the field of modems. This is a pity as high speed international electronic mail could be a boon to people whose languages are not good enough to use on the telephone.

Very many thanks to Cary Karp for his informed articles.

EXHIBITIONS: The Crafts Council Exhibition is now under way, and stays open till the end of August. It is well worth visiting and seeing what some of your colleagues are up to, those of them who could spare an instrument for so long. As you know, I think, I was one of the judges for the entries; most of us were FoMRHI members and, as you'd expect from that, our attitudes were thoroughly practical throughout. We did not look at anything until we'd heard it. First we had to be happy with the sound, and then we looked to see if it was well made, a craftsman-like job). One or two things got in that were not the best craft; nothing got in that didn't sound good within the terms of its use and purpose. I'm well aware of what some of you, and I, have said about the Crafts Council in the past; to some extent this exhibition, and certainly the basis on which we judged the entries, is the answer to that criticism. It's open at 12 Waterloo Place (right at the south end of Lower Regent Street in London) Tuesdays to Saturdays 10-5, Sundays 2-5 but closed on Mondays. Admission is £2 (concessions and for groups of ten or more £1 -- ring Mary Hersov or Liz Lydiate on 01-930 4811).

The Galpin Society's 40th Anniversary Exhibition will be at Sotheby's Conduit Street Galleries (where the instrument sales usually are) from 11th to 22nd August. There'll be a lot of star material there, with some emphasis on the collections of the eleven Founding Members plus the Canon himself. This is one not to be missed. Entrance costs £1 (free to GS members) and there will be free (once you've paid the pound) lectures and demonstrations (not on our instruments I hope). There will be a fully illustrated catalogue which will cost £4 (£5 by post but whether that's from Sotheby's or from the Society is not clear). If you can't get to the exhibition, the catalogue will be a must. I hope we'll get a review copy; if so, more detail will follow in the next Q.

The Edinburgh Collection: As well as the permanent collection of over 1,000 instruments in the Reid Concert Hall, there will be a special exhibition, open every day from 11 am to 6 pm, of The Historic Clarinet, from 9th to 30th August. They have already got a first-rate collection of clarinets in the Rendall Collection, and they've brought in a lot more. Most days there will be guided tours by Arnold Myers and a number of his colleagues, plus a lot of concerts by Alan Hacker, Keith Puddy, Nicholas Cox, Leslie Schatzberger and others, plus a seminar on clarinet technology by Ted Planas. Admission is free. There is also a smaller special exhibition on Sam Hughes and the Ophicleide over the same period, with a lecture recital by Stephen Weston on 13th August. Any further information from Arnold Myers (in the List of Members).

The Pitt Rivers Museum has opened its new Balfour Gallery at 60 Banbury Road here in Oxford, and many of the most important musical instruments are beautifully displayed there; you can now really see them properly. There are also audiovisual displays and a good sound-guide through earphones. They are open Monday to Saturday, 2-4 pm, and like all the Oxford Univesity Museums, admission is free. For any specialist visits (which, like at the Bate Collection, can sometimes be arranged by appointment in the mornings), write to Dr.Hélène La Rue, Pitt Rivers

Museum, South Parks Road, Oxford (the offices, as well as the bulk of the instruments, are still there).

BATE COLLECTION WEEKEND: Our next Weekend will be on November 8th and 9th, and the subject is **Capped Reeds (Crumhorns, Wind-Cap Shawms, etc)**. Bernard Thomas will run the playing side and Eric Moulder the making, maintenance, reed-making and so on. It will cost the usual £15 (either day £10), or £10 for students. Starting at 10 am on the Saturday for coffee, 10.30 for playing and, as usual, going on till we finish. Unlike most of our weekends, we can't provide you with originals (!) to play on; we have four earlyish Hanchet crumhorns and two sets of three Körbers, plus an extra tenor and bass, and no other wind-caps, so please bring your own if you have any. If you want to practise reed-making, bring whatever equipment you have, too, as we may not have enough to go round.

FESTIVAL: The Utrecht Early Music Festival will be from August 29th to September 7th, with concerts all day every day (there seem to be at least six each day), plus fringe concerts, plus lectures, plus instrument workshops and builders and music and book sales, plus two symposia, one on Josquin and the other on the Lute (3-7 Sept for the latter). Information from Holland Festival Oude Muziek Utrecht, Postbus 734, NL-3500 AS Utrecht, The Netherlands; *31 30 - 34 09 81*. The deadline for booking stands (which are cheaper than at the Horticultural Hall) is past, unfortunately (they sent out notices in late April for a deadline of June 1st), but if you are interested, write anyway and ask to be put on the mailing list for next year.

OTHER SOCIETIES: I am asked to tell you (though I would have thought that if you were concerned, you'd know) that the next annual national meeting of AMIS is February 6-8 at Colonial Williamsburg. Further information from André Larson or Margaret Banks on (605) 677-5306.

NEMA has just published an issue of its Journal with a couple of the papers from the recent **Guitar Conference**, one of them an interesting one from Eph Segerman.

FORTHCOMING BOOKS: (here instead of in Book News because I've not seen this one). Malou Haine and Nicolas Meeùs are producing a book, due out this month, *Dictionnaire des facteurs d'instruments de musique en Wallonie et à Bruxelles du 9e siècle à nos jours*, which from the specimen page in the brochure will be more like the *Grove DOMI* than like Langwill's *Index*, with illustrations on page and short articles on each maker. Cost will be 3,250 Belgian francs (515 French francs) from S.A. Cogèdi, Pierre Mardaga, 2/4 Galerie des Princes, B-1000 Bruxelles. They have promised a review copy which hasn't come yet. The same publisher has produced two exhibition catalogues on similar subjects by the same authors: *Instruments de musique anciens à Bruxelles et en Wallonie 17e-20e siècles* and *Les facteurs d'instruments de musique actifs en Wallonie et à Bruxelles en 1985*; they cost 500 FB (79 FF) each. *STOP PRESS:* The review copy of the *Dictionnaire* arrived just as I was about to print this out; it's a massive tome of 765 pages, apparently well produced, the size of one Grove volume but much cheaper. More detail next time.

Uta Henning says that her *Maximilian* is now available; the price when I last mentioned it in Bull.42 (p.9) was DM.48. If she sends a review copy, more information will follow.

Also just out is David Crookes's translation of Praetorius; I have a review copy but only just, so again it'll have to wait.

MY MOVEMENTS: It looks like I'll be here throughout the summer, though as I might take the odd day off (my wife may get narked if we don't, and for that matter I might too), do ring first (0865-247069) if it's a special trip to Oxford. The Faculty has no funds to pay someone to sit in if I'm away out of term, so we would be shut unless I decide to pay someone.

DEADLINE FOR NEXT Q: Let's say 1st October. Meanwhile, have a good summer and while you're lying on the beach, start thinking about the wonderful Comm. you're going to send us.

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BULLETIN SUPPLEMENT

E Segerman

In Comm 700 Maggie Lyndon-Jones distinguishes between our Q and the "more 'permanent'" GSJ. Certainly, a higher fraction of the contents of the GSJ is of more lasting value, but it is only a maker or instrument scholar who has fully left the field who disposes of his old FoMRHIQs. Other members (including Jeremy) agree with Maggie that the two publications should cover different ground and that any overlap is unfortunate. I disagree. I also get the impression that the leaders of the GS would like their Journal to have more controversy, shorter papers, and half-baked ideas (supposedly our territory) to liven it up. There has been no obvious reduction in the quantity and quality of what is going into the GSJ since we have come on the scene and cover some of their supposed territory. There is plenty of good stuff written in the overlap area to keep both publications thriving.

The main difference between the two publications is style. We are informal and have no pretensions at maintaining a minimum quality standard. We don't do too badly on quality. We also publish more often. The ideas are still fresh when they appear in print. It also helps controversy, since one has a disincentive to argue when one expects to have forgotten what it was all about by publication time. To the extent that respectability depends on a formal style, we are not as respectable. But when respectability depends on usefulness, either practical or scholarly, we can hold our heads as high as any.

Current Bulletin, re Comms 701, 719 and 720 Mark Champollion sent lots of Comms for the last Q. I just included a few short samples to test reaction. J. M. reports that reaction.

Current Bulletin, re New Patent The patent promised by J. M. is not included here because it has nothing to do with historical instruments or our modern attempts at making them. If interested, write to Joseph O'Kelly at his new address in the Membership List Supplement in this Q. Current patents don't have any place in our field because they can be invalidated on the basis of 'prior art'.

New Grove DoMI: JM no. 5, Fiddle If the Renaissance lira da braccio (before c.1575) had a soundpost, I would like to know of the evidence.

Baroque lute stringing In the covering letter for his Comms in this Q, Martyn Hodgson writes:

I'm slowly coming round to the opinion that all gut basses were always used on the lute, even in the 18th century: I can really see no other reason for the development of the German Theorboed lute. Of course, I'm aware of the fragments on the instruments in Linhopping (I can't remember the correct spelling off-hand), but even so ..... The difficulty I have lies in the interpretation of the late 18th Austro-Germanic lute music(composers like Hagen, Straube, Kohaut); I'm convinced these pieces were written for the German theorboed lute (iconographic as well as internal musical evidence), but the florid writting in the base seems to prohibit overwound strings. Also, as we've discussed on other ocassions, why was the 18th century theorboed lute invented at all?, since the volume and sustain could have been obtained on an ordinary 13 course lute with the appropriate overwound strings. I simply can't escape the conclusion that they wanted greater sustain etc than was available with the ordinary lute, but were not inclined to forego the rounder sound of all gut basses. Perhaps overwound were used on the ordinary 13 course lute? I dunno!

1775 Catalog Mike Fleming has sent me a photocopy of the Longman, Lukey and Broderip Catalog which was bound in with a book he has, dated 1775. I find it fascinating. Viol de Gambos requiring bridges, pegs and tailpices were still being played. Violin bows with clip-in frogs are still listed before those with screws. Strings 'silvered in the completest Manner' means that open-wound strings were very consciously out of fashion. Also, the implication is that the winding was done in London (I wonder what is the earliest evidence of international trade in wound strings). Guitars were the wire-strung English type. Missing besides the Spanish guitar are the trombone, the serpent and harps other than Irish and Welsh types.

FoMRHI Conference Some years ago we had some very successful FoMRHI conferences. The fantastic success of the Varnish conference in Devon recently (it will be reported on extensively in the Strad) shows that there are topics of current interest which are crying out for someone to organize a conference on. After a recent concert, Chris Page suggested that we should have one on medieval instruments and how they were used. Perhaps we could expand it to include Renaissance instruments. Is this such a topic? Some weekend in January or February might be convenient. Send thoughts about time and place or other ideas to Jeremy or me.

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FoMRHI Comm. 727 **Jeremy Montagu**

New Grove DOMI: JM 5; Further Detailed Comments: The Fs.

(See Comms 604, 646, 671 & 697 for the As, Bs, Cs, Ds & Es)

I think that I have mentioned before the lack of documentation, especially in the shorter articles, which makes it very difficult to get further details of an instrument or to check a point which one might query. Here, at the beginning of this section we find two examples close together, but ones for which I happen to know the references:

Facimbalom: see Bálint Sárosi's *Ungarn*, the first volume in the series *Volkmusikinstrumente Europas* (DVfM, Leipzig) which describes and illustrates this instrument, with a diagram of the layout of the bars. It is very possible that it was this wooden version of the cimbalom (with the characteristic layout of that dulcimer) which led to the development of the old European four-row xylophone which was used here until the introduction, from America (where it derived from the South and Central American marimba), of the piano-keyboard layout (which itself led to the pernicious habit of referring to the bars of such instruments as keys, a habit which has been castigated in each of these Comms on the *Grove DOMI*).

Fadno: described by Ernst Emsheimer as 'A Lapp Musical Instrument', first in *Ethnos 12*, 1947, and then reprinted in his book of collected articles, *Musikhistoriska Museet Skrifter 1*, 1964.

As far as I know, these are the only references to these two instruments; certainly they are the important ones, and it would have cost Grove very little, and benefited the organological community enormously, if they had included them and all the others which are so badly needed. If space were a problem (and I can see that the quantity of missing references throughout these three volumes could add up to a lot of lines), they could cut the title line BIBLIOGRAPHY from all the entries, including those for which they have given references; if a list of articles, books etc, isn't a bibliography, what on earth is it? We do need to be given necessary information; we don't need to be told the obvious, that a list of references is a bibliography.

Fairground organ: I think that we have here one of the rare misprints (commendably rare in a work of this magnitude; the proof-readers have, on the whole, done a magnificent job). In the description of European dance organs, it says that these *were produced in immense sizes* -- really? As big as or bigger than (as this implies) the largest church organs? Is *sizes* perhaps a misprint for "quantities"?

Fairy bells: This is hardly *a modern form of bell harp*; it was a 19th century instrument, not that much later than the bell harp. See Eric Halfpenny in *GSJ XXXI*, 1978 (a missing reference that might be forgiven since it proves that the anonymous author was wrong, but one that he or she should have known).

Faluo: Not content with the usual tautologous *conch-shell*, this entry describes it as *a large shell, usually a conch of a length* ....It would be more useful to give the species; it goes without repeating that it is a conch, and equally without the necessity to tell us, that it is a gastropod, since no other shells are blown.

Fana: Included in this article on an African vessel flute is a reference to the **gozoma**, an *ankle rattle*, to which attention is drawn in the caption to the accompanying photograph in these words: *...wears a gozoma (ankle rattle) just below his knee.* Now this is a *Dictionary of Musical Instruments*, not one of Human Anatomy; nevertheless.....

Fanfare trumpet: This is not exclusively *a straight trumpet*; it can, obviously, be any form of trumpet that is used for blowing fanfares, such as a folded trumpet. Ie it can be a modern natural trumpet as well as those awful straight things with valves which the Kneller Hall trumpeters play (which are really trumpets and valve trombones made into those shapes). I've never, in anything but the most popular and unscholarly literature, met the term used here for *an early one ('herald's trumpet')* either; we usually use the term buisine or sometimes clarion.

Fangufangu: We have here a descriptive problem. This nose flute from Tonga and other islands is not in fact *end-blown*. The ennezure (Mervyn McLean very sensibly uses the term blow-hole, but I don't see why we shouldn't coin the word ennezure to parallel the embouchure of a mouth-blown instrument) is a hole near to the end of the tube (much nearer than a normal embouchure on a mouth-blown instrument), but nevertheless bored in the side of the tube. Because of the way in which it is held, the instrument projects forward just as end-blown mouth flutes do; nevertheless it is a side-blown instrument. This term is not used because an instrument is held sideways but because the blow-hole is bored in the side of the tube.

Faragna: A trumpet with *one stop in the tip*. This misuse of stop will not be ignored either here or in future Comms; if one could have things that were more or less wrong (like more or less unique!), this would be one of the most wrong. It is, to my mind, much more serious than the conch-shell and the keys of xylophones and lamellophones, both of which we shall ignore here, even though there are examples to be found among the Fs, unless there are other reasons to call attention to them as there was with the **Faluo** above.

Feko: Here is a pair of flutes, one of which *has seven finger-holes* and the other of which *has five stops*! The mental picture this calls up is fascinating. They are also *held together and played at an acute angle to each other*, one of the swiftest contradictions in terms that I have encountered. **Either** they are held together **or** they are played at an angle to each other; they cannot be both.

Fiddle: I do not see the justification of referring to the type of mediæval fiddle which was *played, like its Renaissance*

descendant, downwards in the performer's lap with the bow gripped from below, as the medieval viol; we might just as well refer to the mediæval fiddle held on the shoulder as the medieval violin. Anyway, if Ian Woodfield is to be believed, and I think that he is (see *Comm. 582*; this book is not cited in the bibliography to this article, nor is Woodfield's original article in *RMA Journal 103 [I'm citing the number from memory and it may be wrong]*), *the ancestry of the true viol was different. There is, in general, far to much use of this term, the medieval viol*, in this article, and, I suspect, too much unstated but implicit suggestion that it was a distinct instrument from the normal fiddle (or medieval violin!) rather than what I am more inclined to believe was a player's choice of which way up he held the thing.

In one paragraph we have *It [the medieval viol] went out of fashion around 1300*, and in the next *The medieval viol, however, is unlikely to be have been intended much after 1300*; we do not need both statements.

There is a very dangerous assumption here that because the renaissance lira da braccio had a soundpost, the large mediæval fiddle, which, like the lira da braccio, also had one or more off-the-fingerboard bourdons and a sagittal pegbox, must have had a soundpost too. There is no logical connexion here and it does not necessarily follow.

I do not follow the statement, in connexion with the early bow, that *Sometimes the bow was made from a cleft stick, one side having been broken off to leave a nut to which the hairs could be attached*; the illustrations in question seem to me to indicate much more certainly the use of a forked stick, one arm of the Y of which was broken off for that purpose. It would seem to me possible that *15th-century paintings [which] show a knob at the end [of the handle of the bow]* indicate a peg for tensioning the bow-hair, as on various modern folk instruments (but only as a possibility; not as an assumption!).

The statement that the bow *is thought to have originated from the hunting bow* surely contradicts Bachmann's evidence that a roughened grass stem seems to have been the originator.

Finally (though there are a number of other arguable statements here which I will leave to Eph to discuss, since he is more expert on string instruments than I) although the 'see also' section at the end is replete with non-European and European folk fiddles, apart from a general classificatory statement at the outset, there is no discussion of fiddles in any other sense than that of the mediæval European, and the rapid reader could well be left with the impession that the fiddle was a purely European phenomenon.

Fifi: Why not give this instrument its proper classificatory name of ribbon-reed?

Fingerboard: Surely the fingerboard is not *rounded thoughout its surface to allow the bow to touch each string separately*. Isn't it that shape because the bridge is rounded for that pur-

pose and the fingerboard must follow the same contour (ie it is rounded because the plane of the strings is rounded, and not vice versa).

Fingering III: (I leave the fingering of keyboard and string instruments, sections I and II respectively, to others of you; not my field at all. Section III covers wind instruments, which I know more about). What is the evidence that, before the modern reintroduction, the crumhorn had *a number of closed keys operated by the left-hand thumb and first finger to extend the range upwards by a couple of tones*? Surely this was one of Steinkopf's modifications to make the thing 'more useful'.

What is the evidence that *the curtal.... could be overblown at the octave, though not very well*, and that its bore *doubles back twice*? I have never seen a curtal with more than one U-bend (at the bottom of the butt; even the great bass does not double back a second time in the way that some late 18th century and more recent contrabassoons do), and, in my admittedly limited experience, there is no difficulty in overblowing.

Was it true that *the upper octave [of the shawm] was poor in tone*? That's not my experience of modern folk shawms; they can beloud in the lower octave and really pin your ears back in the upper. Was our early shawm any different?

On how many *larger instruments was there some use of closed keys to obviate stretching*? Open keys yes (eg on bass recorders, larger shawms, bass traversi as in Diderot, etc), but closed keys? Where you see closed keys is on bagpipes (in Mersenne for instance) and curtals (where you don't have enough thumbs to go round all the holes in the upward bore) and the chalumeau (and later the clarinet). In other words, the closed key was introduced on instruments which, because of their range or their acoustic behaviour, needed more holes than the player had fingers and thumbs.

The serpent is **not** *the true bass cornett*, any more than the bassoon is the true bass oboe; in both cases the bore/length ratio is quite different. Anyway, the true bass cornett was, oddly enough, the bass cornett (see Morley-Pegge's article in *GSJ XII*, 1959).

At what period did *the most common sizes of consort instruments - descant, treble, tenor and bass - normally sound the low six-fingered notes as E, A, D and G respectively*? It is not clear which wind instruments are referred to as *consort instruments* but it isn't true of recorders, transverse flutes, curtals, cornetts or crumhorns anyway. Of what others is it true?

Was it true that *The development of modern [sic] orchestral woodwind instruments in the 18th century led to rapid improvements in fingering techniques and therefore to greater demands by composers* or was it the greater demands of composers that led to the improvements of fingering techniques? My bet is the latter, but I suspect that we shall not know until we know which came first, the chicken or the egg.

The C-key was fitted to the oboe from the beginning, rather than *normally*; if there isn't a C-key, it isn't an oboe, it's some amateur instrument such as a musette.

The bassoon needs both thumbs to extend the range down to the bottom B flat, not just the left thumb.

Eric Hoeprich has proved (see *GSJ XXXIV*, 1981) that the early clarinet did not need *a group of keys at the bottom of the instrument* to fill the gap between the lower and upper registers. Nor were the lower keys initially *activated by both little fingers*; the low E key was controlled by the lower thumb and only when the closed F sharp key was added was the upper little finger invariably involved; the right little finger controlled only a chromatic key, not one that filled this gap.

Theobald Boehm introduced the ring-key, not *the key-ring system*. (Did he? Was he the first to fit it on the flute? Or did Sax, père or fils, get in first?).

Klosé's clarinet system was based on the conical Boehm mechanism, not on the cylindrical Boehm system, as is suggested here (I suspect as a result of editorial cutting). The use of Boehm's mechanism is not the same as the use of his system, which has never, as far as I know, been applied to the clarinet with all its implications of finger hole sizing and placement.

Finke: I know that Finke marketed his coiled trumpet (with the fingerholes) under the name of clarino; all the same it seems a pity to say that *he reconstructed the round clarino from the picture by Gottfried Reiche*; nobody except Finke would refer to the tromba da caccia in Reiche's hands as a clarino, which was a register in the trumpet's range, not an instrument; it is even more a pity to refer to the picture as being **by** Reiche; Reiche is the subject, not the artist!

Fipple: May I draw your attention to this article, which was one of my contributions as a result of my criticisms of the main *Grove*, and beg you never to use the term? Since nobody agrees on what it means, it really would be better to let it sink into oblivion.

Flageolet: It is misleading to say that *in the 19th century the French or 'quadrille' flageolet gained as many as six keys*; the quadrille flageolets were often made with full conical Boehm mechanism, with ring keys, rod axles, the lot; I was very glad to be able to buy one recently for the Bate Collection.

While it may be true, for date, that *in 1803 William Bainbridge ... began making so-called 'English' flageolets ... having six holes in front*, the implication that Bainbridge invented this arrangement is untrue; his instruments were elaborations of the commonly pre-existing penny whistle (to use Vincent Megaw's excellent name for small duct flutes with anything from four to seven holes).

It is certainly untrue that Bainbridge made *'double' flageolets with two tubes bored from a single block of wood*; I know of no

example of his make which does not have two separate tubes set into a common head.

It is also untrue that *Bainbridge's 'triple' flageolet added a third pipe which served as a drone.* The third pipe has a number of keys and/or holes and, controlled by the thumbs like the upward bore of a bassoon (one reason why Bill Waterhouse is one of the better players of the triple flageolet), provides a bass.

This is where my copy suddenly turns into vol.II and starts talking about ornaments; it was misbound with part of the last gathering coming from the wrong volume. When I discovered this, they sent me a xerox of the missing eight pages.

Flaviol: I don't see how a tabor pipe can have *five or seven finger-holes*; you'd drop it if you only had one hand to hold it and play it.

Flexatone: One day when I was playing with the Royal Phil and, as so often, gossiping between pieces or takes, Freddie Harmer (then the principal percussion player -- come to think of it, as it was Freddie it's more likely to have been in the bar) told me that when they played Khachaturian's *Piano Concerto* with the composer conducting, he said that he no longer liked the big flexatone solo in the slow movement, and that it should be left out (much to Freddie's disappointment as he'd been practising it hard; it isn't at all easy to play).

Floyera: It seems odd to say of this Greek end-blown flute that *the pipe is without a lip-rest*; the use of a lip-rest is very rare and would surely not be assumed unless its presence was specified. As far as I know, it is only found in Turkey, and not very often there.

Flute: The illustrations of examples of apertures and blowing edges is, in the first example, misleading. I have never seen a Middle Eastern nay (with one exception from Turkey in my own collection) that has a plain, unshaped end. All the others that I know have the end either chipped with a knife to make a sharp edge, or ground to a smooth chamfer (always external, of course, in both cases; an internal chamfer is almost invariably a sign of misclassification, as wih the buguri of the Todas which is often described as a flute whereas it is a folk cornett, and is accurately described as such here).

How many *organologists class the flute as an 'air reed'*? The air is the sound generator but it does not behave as a reed in any respect; why call it one? This rather revolting term leads to others which are worse (*free air reeds* and *confined air reeds*); I don't know any serious organologists who use them. The word fipple (see above) rears its ugly head here again. There is reference to *the mouth-hole and embouchure*; aren't we reading the embouchure and embouchure? This introductory GENERAL paragraph is really rather a mess. As with fiddles (see above) there is no other indication (apart from the huge list at the end and one page of 8 photos) that the flute exists anywhere else than in our orchestras; there is no proper discus-

sion of flute typology, development, etc, nor is there any survey of what types of flutes are used in different parts of the world, which is quite an interesting subject (why are transverse flutes the main instruments in India, China and Japan and so rare everywhere else, apart from post-baroque Europe; why are end-blown flutes the most important in the area covered by the old Ottoman empire, and so rare everywhere else; and so on).

The Boehm system fingering chart is odd; it shows, for all notes except G# that the G sharp key should be open (an open circle does **not** mean do not operate, it means open, just as a blacked-in circle does not mean operate, it means closed).

It is not true, today, that *the basic scale of the flute begins on d'*; this was one of Boehm's changes, and the natural scale is now that of C major, not D.

The description of the Rudall Carte 1867 model seems to be confused with the 1851 system.

One should not describe a modern system piccolo of conical bore (as many are) as '*conical Boehm*'; that would imply that it had the 1832 fingering system.

The flûte d'amour is not invariably pitched in A; some were in B, some B flat and some A (by 'in' I mean the six-finger note).

It is not true that *an E♭ flute, a minor 3rd above the concert flute, has recently been introduced*, though I suppose that this depends on your sense of time. It was the alto flute of the renaissance, the third flute of the baroque and early classical period, and the E♭ band flute of the 19th century and today.

It is not true that *after World War II, band flutes ceased to be manufactured*; makers' catalogues still list them and flute bands still play them.

The well known relief of an Etruscan (Volumnian?) playing a transverse instrument (plate 5 here) is not usually thought to be a flute; it is normally considered that the upward projecting segment of the instrument contains a reed; certainly it is much too high to be a flute embouchure.

Is Slovakia a *Germanic land*? If not, it is not true that *the earliest western European representations all come from Germanic lands*, for the well-known bronze aquamanile with a transverse flautist standing on the back of a centaur, cited as an example of this, comes from Slovakia.

Were flute keys ever made of pewter? I'd have thought it much too soft a metal to stand up to the leverage required. They had pewter plugs, in some varieties, of course, but that's not what the key was made of.

It is not true that *Rudall, Carte & Co. remains the leading English maker*; Albert Cooper and the Flute Makers' Guild put them in the shade long ago.

I'm sure that some of our flute specialists can add quite considerably to this rather superficial list of comments.

Fornke: This notched flute *is unusual in being held in a vertical position.* Really? I've seldom seen notched flutes held in any other position.

Four foot: A bad mistake here; for *128 Hz* read 512 Hz; they have divided instead of multiplying.

Frame drum: There is no evidence that it was anciently (eg in biblical times) *exclusively a woman's instrument*; it was used by women certainly (most of us are agreed that the biblical tof used by Miriam and her women after the crossing of the Red (or Reed) Sea was a frame drum, no quarrel with that reference here) but that does not mean that it was **only** used by women.

Friction drum: A pity not to cite Balfour's article on this; it is still the only complete survey.

A long list, this one; let's hope that there are fewer to comment on among the Gs, and perhaps we'll be able to do a double letter next time.

FoMRHI Comm. *728* **Jeremy Montagu**

Review of: **Margaret Neuhaus, *The Baroque Flute Fingering Book*, Flute Studio Press, 846 Wellner Road, Naperville, IL 60540; 157pp typescript, thick paper cover, comb binding; $16.50 (postpaid, but that may be only in USA; it might be safer to add another dollar from Europe).**

For *Flute* read *Traverso*; this book does not cover the instrument that was known as the flute in the baroque period, as the cover illustration makes clear.

I've had a letter from one of you asking me to include in reviews of books like this one, which come from little-known publishers, some indication of where you can get the thing from. I'm afraid that I can't do this with any certainty because the books come to me direct from the publisher (or occasionally, as with this one, from the author), and I don't know, any more than you do, who is going to stock it. In this country, there are a couple of music-book dealers who are members of FoMRHI and always worth trying (Tony Bingham in London and Brian Jordan in Cambridge, both in the List of Members); there are Blackwell's Music Shop here in Oxford (38 Holywell Street) (not what it was for range of stock, but not bad; they'll usually get what they haven't got), and May & May who are first rate (Arundell House, High Street, Tisbury, near Salisbury). I've got much less idea of good sources in the rest of Europe, and less still further afield (is Theodore Front still going in California? He used to send out good lists, but I've not had one

for a long while). Perhaps some of you could send in the names and addresses of places that are worth trying in your own country. However, please note that with small publishers like this one, or publishers that I've not heard of before, I do always try to include their address; if you can't get the book locally, write to them direct. I know that officially a publisher is a wholesaler, and that if you write to one of the big firms asking for one copy of one of their books, you probably won't get it, but I've never had a refusal, that I can remember, to a request for a book from one of the smaller firms. When it's a firm in a different country, you'll have some complication in paying for it, but that's not insuperable. Bear in mind that they know that they sent us a copy to review, so it could help if you say that you read a review in FoMRHIQ, that you can't find a local stockist, and please could they supply direct.

After a brief resumé of the history of the baroque traverso, Dr.Neuhaus lists and describes briefly, in chronological order, the sources from which she has taken fingering charts: Hotteterre, Prelleur, Corrette, Quantz, Mahaut, Delusse, Granom, Cahusac, Heron, Tromlitz, Wragg, Gunn, Devienne, Miller, Hugot, Beale, Nicholson, Keith, Alexander, and Bown, covering a range in time from 1707 to 1825 and by no means all from the baroque period. Nevertheless, all the charts consulted are for the one-key flute and all their suggested fingerings may be worth trying, especially by anyone with an instrument from the later periods, or with an embouchure smaller than an Hotteterre or larger than a Stanesby.

This is followed by a list of chromatic fingerings, from the C sharp below the lowest note of D (both Hotteterre and Mahaut suggest that this note is possible) to the D natural three octaves above, including most of the possible enharmonics (E sharps, F sharps, G flats, F double sharps and so on) which were not, in the days of meantone, truly enharmonic but were recognisably different pitches. Next comes a section on trill fingerings, with a description from the sources of what they understood by t, tr, and + and the fingerings they advise. This is followed by a similar treatment of the flattement and that by the battement. Finally, there is a section with examples of "how the use of alternative fingerings can smooth out technical problems".

I can conceive of no book more useful than this for anybody playing the one-key flute who is not already a top-flight professional. Of course, any aspiring flautist should already have studied all these fingering charts, but how many have in fact done so? Still less, how many have tabulated all the alternative possibilities and suggestions. They are all here, and it's probably safe to say that anyone who can't get their instrument in tune with one of the fingerings given here should either throw the flute away and buy a new one or else should take up a different instrument (pick and shovel maybe?). I'd even suggest that the enterprising makers among you should keep copies of this book to sell to your first-time customers. Certainly my copy is likely to be out on loan to our students more often than it's going to be on the Bate Collection shelves; I only wish that it had arrived in time for our Traverso Weekend last term.

New Grove DoMI : ES No 5 : C entries after Ci

Consort (by W Edwards)

The author surmises that the English term, derived from the Italian 'concerto', originally meant a general musical ensemble of any sort, but that early-on it acquired the additional meaning of a group of mixed instruments. I read the evidence differently, seeing no use of a general term which included both mixed ensembles and sets of voices or of one type of musical instrument. When sets were included, the types were mentioned, and the term consort always implied mixed forces. John Adson's 'Courtly Masquing Ayres' (1611 and 1621), calling for "violins, consorts and cornets", clearly did not include sets of violins and cornets in the definition of a consort. In Philip Sydney's 'The Countess of Pembrokes Arcada', Lib III, p 287 (1590) we read that after a cornett solo "an excellent consort straight followed of five Violles and as many voices." Here there is one consort employing but two types of musical forces.

The invention of the term "Mixed Consort" by Warwick Edwards is quite unnecessary from an historical point of view since a consort was always mixed. It was probably intended to have a modern practical use in distinguishing between sets of voices or instruments of one type (called 'consorts' since late in the 19th century) and consorts of the type that Morley and Rosseter published music for. But I already see 'Mixed Consort' being generalised to any mixed ensemble, leaving the Morley-Rosseter consort without a distinguishing modern name.

The early meaning for the term, that of any mixed ensemble faded out in the first half of the 17th century. When Elizabeth showed a partiality for the Morley-Rosseter type of consort in 1575, that particular grouping grew in popularity and it became a more specific meaning for the name. The Morley and Rosseter publications needed no qualifications when using the term 'Consort Lessons'. Early in the 17th century, this type of consort dropped from popularity, while the meaning of the term became generalised to denote any mixed ensemble with a number of instruments providing a plucked chordal continuo. The plucked continuo instuments were absolutely essential, being characteristic of consorts. So Charleton (1654) could refer to "consortative instruments such as the virginalls and lute". By this time the other instruments in the consort had lost diversity and were just sets of viols or violins.

Sets of viols had, for some time, been playing with organs whenever convenient. The organ just doubled all the parts, allowing the number of viol players to be less than the number of parts, and helping poor readers along. I know of no evidence that this ensemble was ever called a consort in the first half of the 17th century. In the second half though, the organ became accepted as a legitimate consortative instrument. Then the term broadened to also refer to a music-playing occasion and to the music played by a consort (ie, by a string band plus continuo). Thus North could praise the consorts of Corelli.

Continuo (by P Williams)

Williams seems to think that the lyrone or lyra da gamba was something like a cello doubting whether Agazzari's recommendations about its use involved playing chords. The lyrone can't do anything else.

The entry paraphrases Agazzari as writing that "various string basses were playing at both written pitch and the octave below". What was missed was the very important point that this was done on the same instrument. When describing the playing of the lowest part on the violone, Agazzari wrote "dwelling as much as possible on the heavier strings, frequently touching the lowest ones." There is choice clearly involved here.

Continuo parts were generally written in the bass clef, and with the bulk of the music rarely using more than one ledger line, the normal range was D to d'. This corresponds

with the open string range of the bass viol and is an octave higher than that of the contrabass violone. So these instruments are ideal for consistently playing at 8 ft and 16 ft pitch respectively. But the string ranges of the most used continuo instruments, the violone and the theorbo, are displaced from this natural range by half an octave. On these instruments high continuo parts can be played by fingering the highest string, so all can be played at 8 ft pitch. But the extra half octave on the bottom of these instruments allows all but the lowest half octave of the written continuo part to be played at 16 ft pitch as well. This choice was obviously there to be exploited musically, perhaps independently from phrase to phrase (or point to point). Agazzari's statement was probably only giving the simplest criterion for this choice when one is not being musically adventurous.

Cordes avallees (by J Tyler)

The entry omits Praetorius's use of the term for retuning the third course between the lute-like and guitar-like gittern tunings he gave for the small English cittern.

Cornett (by A C Baines)

When listing the instruments used in the 1589 Intermedii, the entry interprets 'sopranino di viola' as most probably the violin. In that source 'viola' consistently meant 'viol', and the instrument was more likely a sopranino viol like the GM da Brescia instrument in the Ashmolean Museum and called by Zacconi 'violetta picciola'.

I missed the point, made in the book on the trumpet by Smithers, that in 18th century Germany the cornett was a second instrument for trumpeters.

Cornett-Ton (by G Oldham)

I know of no evidence to support the claim that this pitch standard is a' = 460 Hz. This entry would benefit greatly from consideration of the issues raised in Comms 442 and 683.

Courses (by I Harwood)

I would have the last ten lines of the entry deleted. The statement that the high string in an octaved course "should be at a considerably lower tension" reflects current practice on lutes but the historical evidence for it on lutes can easily be interpreted otherwise (see Steinberg section in Bull Supp last issue). The statement is false for baroque guitars and is highly unlikely for the triple courses of the French cittern (with two of the three at the high octave).

The implication that unison overspun strings were improved replacements for octave pairs is not supported by any historical information I am aware of. Similarly, I know of no support for the statement that "paired or tripled courses were used on instruments with relatively low-tension strings."

Cuatro (Anon)

It is stated that its predecesor was the 15th century Cavaquinho. The Cavaquinho reached Africa, the Americas, and even Hawaii, where it became the four-string uhelele." I am sure that 15th century is too early since the original Renaisance guitar was developed in the 16th century.

Cymbalum decachordon (Anon)

The total entry is: "Term inscribed on a Bandora of 1580 by John Rose of London." The 'bandora' identification is of course according to Harwood's Double-Standards theory. Harwood suggested this identification in his EM article, but I doubt whether he was convinced that all other possibilities were excluded. The identification should be something like 'instrument of the bandora-orpharion family.'

FoMRHI Comm 730 Bill Samson

Review of: Kevin Coates. Geometry, Proportion and the Art of Lutherie. Oxford University Press, 1985. £40.

This sumptuous, expensive text is the first book to be devoted entirely to the topic of the geometrical construction of stringed instrument shapes. The author states at the outset his belief in the conscious use of proportion, by luthiers, in the design of their instruments; just as architects have done since Classical times. The work of architects was very well documented at the time, whereas the work of luthiers is almost entirely devoid of contemporary documentation, apart from the relatively superficial treatment of Mersenne, Praetorius etc., valuable though their work is. The author attempts to fill this gap by observation of instruments which fall into nine categories: viols, lyras, violins, violas d'amore, kits (pochettes), lutes, mandores (and mandolines), citterns and guitars.

An introductory chapter sets the scene and states the objectives outlined above. The second chapter is intended to place Mathematics in its historical context; the third chapter is an overview of geometry and its relationship to early philosophical ideas; the fourth chapter is an account of proportion and the kinds of geometrical construction commonly used; the fifth chapter considers the choice of instruments studied in the following chapter (6). In the seventh chapter the author summarises his findings. Observations on the findings are given in chapter 8 and in chapter nine he draws a number of conclusions from his analysis.

This book will be a most useful reference work for any luthier who wishes to design his own instruments from scratch, rather than copy a surviving specimen, warts and all. While the reviewer is favourably impressed by the book and is appreciative of the enormous amount of labour involved in its production, there are a number of areas which raise questions in his mind - some trivial, others less so. These criticisms are set out below.

A general criticism of the analysis is that the measurements are quoted to an assumed accuracy of 0.5 mm. While such accuracy is, perhaps possible in the measurements of lengths and distances, it seems very optimistic to estimate radii of curvature to such close tolerances. My own attempts at similar work lead me to believe that (in the case of lutes, at any rate) radii of curvature, particularly near the bottom end of the instrument, are hard to estimate with an error of one centimeter - 20 times worse than the author's assumption. The author then goes on to show how several of the lengths measured in this most difficult way are in exact whole number ratios to each other with errors being mentioned much less frequently than one would wish.
At another point (page 35) the author calculates a quotient of two values, each of which has 2 significant figures of accuracy. The result is expressed to 3 significant figures which happen to fit the hypothesised result beautifully. This consistent under-estimation of errors does, I feel, leave the author open to accusations of "laundering" the figures to produce the results he wants. A more objective treatment of the errors and a straightforward appraisal of goodness of fit would give me much more confidence in the author's conclusions. Having said that, however, the conclusions are of great interest, though, perhaps, a little less certain in some cases than the author claims.

Another rather serious criticism of the work set out in the book is that the author makes no mention of work by other investigators in the field. For example, in the case of the lute it is exceedingly discourteous to make no reference to the seminal paper of David Edwards (LSJ, XV, 1973), as well as the later work of Abbott and Segerman (FoMRHI Comm no 5, 1976), the reviewer (FoMRHI Comm no 377, 1981) and Sohne (in Lindley, Lutes, Viols and Temperaments, Cambridge, 1984). Although the reviewer is less familiar with the other families of instruments which are analysed, there is a certain amount of work, at least in the case of violins, which should be acknowledged.

My remaining comments are less serious in nature and will be dealt with in (approximately) the order in which they appear in the book:

On page 4 the author asserts that mathematics, today, is a language of "quantity". Mathematics is now, and always has been, a means of communicating ideas, and an aid to reasoning, in which ambiguity is minimal.

In chapter 4 the ideas of proportion are expressed algebraically. The use of geometrical explanation would be clearer, as well as being in keeping with the aim of the study.

In chapter 5 the term "great circle" is misused. This term is used in spherical coordinate geometry and should not be used in any other sense.

The instruments chosen for analysis do not comprise an ideal selection - too many are by unimportant makers. For example, while the Warwick Frei is welcome, it would surely have been more appropriate to consider the work of a make like Venere, or the Tieffenbruckers as typical of the "plumper" lute outlines than the rather poor Hieber lute which has been copied by far too many makers already. Again, the instruments by Goldt and Rauche are not typical late lutes. The work of Hoffmann, or Schelle would be of greater interest.

The bridge positions on violins, viols etc. were not "fixed" in the sense that they are today. A glance at the iconographic evidence confirms this. It is therefore unlikely that the current bridge position has great significance in the proportions of any instrument.

Few instruments show exact symmetry. The lutes are particularly prone to accidental asymmetries. I can find no mention of how such distortions were treated in the analysis.

The claim that the type of lute shown in the Arnault drawing was superceded by the slimmer Bologna type is without any real basis. I would venture to suggest that the rather ugly shape of the Arnault lute was probably never used in practice - there is no evidence for lutes of this shape in the iconography of the period.

The analysis of the Warwick Frei raises a number of questions. My own measurements lead to only 2 significant figures in the Golden Section found for the soundboard length divided by breadth. In any case, the soundboard was probably shortened by at least 10mm in the conversion of this lute from 6 courses to 11 courses. To be fair, however, it is JUST possible that the sondboard was originally this length if the fingerboard overlapped the neck block by about 10mm. The centre of curvature of the lower end of the lute in not on the centre line, but about 10mm to the right of it. The "vesica piscis" circles have a very poor fit to this part of the lute outline. It is very misleading to quote this radius as 99.5mm when 95 plus or minus 5mm would be a more honest appraisal of the radius of curvature. This then leads one to wonder if we do, indeed, have a true "vesica piscis" which the author asserts on the basis of his "accurate" measurements. It has been suggested that the position of the bridge of this instrument has been altered in the past. If this is so, then the concentric circles of figure 87 are less convincing.

A more general point about the measurements of curvature at the lower end of a lute is the effect of the thickness of the capping strip on this. Martyn Hodgson has suggested to me that it might be more appropriate to fit curves to the INSIDE of the ribs, ie to the shape of the mould on which the lute back was built. It should be noticed, too that the capping strip is NOT the same as the "lace" (page 112). The lace was in fact a strip of parchment or other material glued right round the back to soundboard joint in order to strengthen it and protect the soft edge of the soundboard.

The analysis of the Hieber is most unconvincing. The author explains poorness of fit at the lower end in terms of a conjectured "distortion" which is supposed to have taken place when a repair was made to the lower end of the soundboard. In my experience of lute making and repairing, I cannot believe that distortion of this magnitude (about 8mm) is possible at the lower end of a lute - at least not without introducing a bulge in the ribs which would prevent the soundboard from fitting. Again, ridiculously high accuracy is claimed for radii of curvature measured in the vicinity of this distortion. This analysis contains the least convincing figures in the book.

The Buechenberg theorbo surely has a yew back, and not a pine one, as is claimed on page 118.

The Goldt and Rauche lutes are NOT theorboes. Spencer has made this clear in his article (EM, vol4, no 4, 1976). Segerman also has some views on such terminology (FoMRHI comm 712, 1986).

Having made these comments, I would like to reaffirm that this is a most important work which breaks a good deal of new ground - for example the treatment of the cross sections of lute backs has never been attempted so successfully in the past. I would commend it to all luthiers, as food for thought rather than as tablets of stone to be accepted without question. I believe that the book will form the basis for much future work. In particular, I hope that a better statistical treatment of the analyses will eventually be carried out by an investigator with the appropriate qualifications.

FoMRHI Comm. 731

SELECTION OF WOOD ACCORDING TO A GERMAN DOCUMENT OF THE 19th. CENTURY

Rémy GUG

This document is the English version of the lecture I gave at the Conference organised in Paris at the Ecole Normale Supérieure, rue d'Ulm, the 19-20 April 1985. The records of the meeting entitled "Recherche scientifique et facture instrumentale" have been published and are available from: C.E.N.A.M., 51, rue Vivienne, F-75002 PARIS.

The first reaction arising from your invitation to make a contribution to this discussion was to ask myself what place the historian of Technology could or should hold in the field as defined in the title "Scientific research and the construction of musical instruments". The researcher in the history of Science and Technology has, as his only tools, a pair of spectacles and the past treasures of our libraries. What research resources can he put at the disposal of the scientists and craftsmen of today?

I looked for a reply amongst the array of documents gathered these last few years with the ultimate intention of a publication devoted to one of the favourite materials used by the Ancients:

WOOD

Their conception of this material and their approach to using it in practice are, in may cases, very different from our own. That is the reason why I chose to offer here a technique, which, as far as I know, is totally forgotten today.

The art of choosing the spruce for soundboards as a function of exact morphological data.

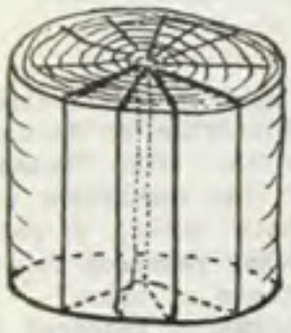
These lessons are to be found in publications whose aim from the end of the 17th. Cent. was to create links between Science and Technology - the range of literature of the "Enlightenment" aimed at spreading knowledge in the daily life of people, in this case Germans.

Our reference of interest is the Allgemeiner Anzeiger der Deutschen published in 1809. This contains articles on subjects as wideranging as beekeeping, improvements in the preservation of meat, the most effective vehicle for hay-making or the right addresses to obtain first class forte-pianos....

Monday's edition 20.9.1809 is especially important for us. It publishes an article by the bavarian engineer, HUBER, of the Saltpans and Forest Dept.. He describes his numerous observations about the morphology of the spruce and gives us valuable clues as to how to make the best possible use of these. The discovery of this extract had a great effect on me. With various additional details they were the same explanations as those of the Swiss

forester in 1977, who allowed me to fell some spruce trees for soundboards. I did not know at that time that I would rediscover his statements in a German text of the beginning of the 19th. Cent.

The Swiss forester drew my attention to a phenomenon easy to detect in colonies of spruce trees. We are all aware that a tree reveals annual growth in the concentric rings clearly to be seen on a stump or felled trunk. Experts in tree structure have also shown us that these rings are linked by structures arranged, in a cross-cut, like the spokes of a wheel: the medullary rays. The sum total of these rays rises from the base to the top of the trunk, in a direction - and this is the crucial point - which is only rarely parallel to the vertical axis of the tree. The attached sketch shows a disposition which is not often found in a forest.



Nature has preferred to chose a spiral formation and has the advantage of a dual solution. We are faced here with a phenomenon well known to researchers, especially biochemists - molecules levogyres and dextrogyres. As a matter of fact the Swiss forester made me realise, not without a certain hint of humour typical of his country viz. that the direction of the planes formed by the superimposition of the medullary rays resembles the political cross section of the majority of modern citizens. "*They all turn to the left when young, and a great majority tend progressively towards the right, the older they get*"

Precisely what HUBER, the Bavarian engineer shows us, except for the comparison...!

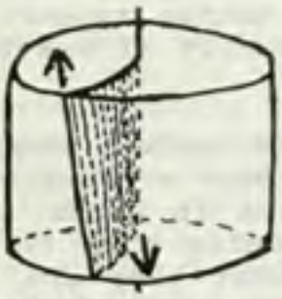
In their early years the fibres of a tree we take as vertical form a screw shape going from right to left and from bottom to top. Then a certain number of these trees, as years go by, will see their fibres move, in fact, through the vertical, finishing up by forming a screw-shape, the inverse of the first.

HUBER defines these two types of spruce as follows:

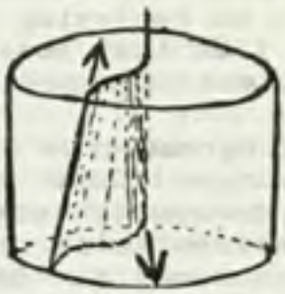
a) those turned towards the left (levogyres) simply follow the daily tract of the sun. Hence their name "*nachsonnige Bäume*" "*following the sun trees*".

b) while the others (dextrogyres) are called "*widersonnige Bäume*" "*turning away from the sun trees*".

The two following sketches are my attempt at showing these two morphological categories. HUBER's text, following the great German literary tradition, has no technical drawings. I hereby, as far as I can, fill in the gap:



LEVOGYRE : nachsonnig



DEXTROGYRE : widersonnig

What interest can these two types have for the construction of musical instruments?

Splitting the wood for instrument making.

HUBER is quite categorical: only spruce "*levogyre*" can or should be used for soundboards. He gives us the reason at some length and I quote briefly, pointing out that it is useless to call on some mystic thought or solar alchemy! It is merely one further example showing the great gifts of specific observation which the Ancients had.

Soundboards must always be split clearly following one of the medullary rings. The aim is to obtain pieces with level surfaces, with fibres parallel to one another and continuous along the whole length of the relevant section. Looking at the two sketches it will be obvious that, in that case, it was impossible to use "*dextrogyres*", here the fibres criss cross and if you split such a trunk, you obtain surfaces shaped like a S. On the other hand, if you use a saw, you will obtain level surfaces, but the fibres will change direction from centre to circumference. Who amongst us, however slight his experience in working on spruce with a plane can fail to remember those irritating cases when slight tearing shows up on one of the surface halves, whatever the course chosen for planing?

Only those trees whith twisted fibres following the "sun course" (levogyres) can satisfy the economic and acoustic demands of the maker of musical instruments: fibres with a single direction producing a homogenous beauty together with a minimum of loss during splitting.

Perhaps we should be more aware of this at the end of the 20th. C. when far reaching techniques allow us (fortunately or otherwise) to "control" nature rather than let ourselves learn from her and to profit from the many offerings.

FoMRHI Comm. 732 **Jeremy Montagu**

Converting Herz To Cents And *Vice Versa*

To some of you this may seem anathema; your Hon. Sec. printing computer programs in the pages of FoMRHIQ. However, many of us now have these toys, and, with the skilled help of the younger generation, why not make use of them for purposes such as this as well as employing them as bigger and better typewriters? I put it like that because I am still basically (I use that word with intent) ignorant of computing.

These programs grew out of a discussion on scales, temperaments and tunings. Some books (eg Murray Barbour's classic *Tunings and Temperaments*) cite all their examples in cents, a method which allows those of us accustomed to using them (if you are not accustomed to them, or don't know what they are, see the paragraph in [] below; the rest of you can skip that paragraph and go on to the next one) to get quite a good idea of what a scale etc sounds like even before we hear it. Others, however, sometimes provide herz (useful only to those who not only have perfect pitch but who remember the herz figures for all the pitches of whatever scale they use as a mental reference) and occasionally ratios (useless to all but professional mathematicians).

[The cent, for those who have not met it before, is the equivalent of the millimetre, the basic unit of measurement for all of us who deal with tunings of any sort. It was invented 101 years ago by Alexander Ellis, a man who was fascinated by music of all sorts, from all over the world, and by acoustics (he was the translator of the standard English version of Helmholtz *On the Sensations of Tone*), but who was himself tone-deaf; Hipkins (of Hipkins & Gibb, the famous picture book, and of the piano firm, Broadwood's) provided the musical ear in his experiments. The cent is one hundredth (hence the name) of an equal-tempered semitone, and although this is to some extent an ethnocentric standard (only we, the Indians and the Chinese have ever used, even theoretically, twelve equal steps to the octave), so is any standard of measurement, and the cent, along with Robert Stuckey's recently introduced unit of pitch, the ellis (the cent is a unit of interval) provide the least ethnocentric units of pitch and interval measurement available to us in the discussion of world music. The cent also, of course, provides the unit of measurement for all the tunings and temperaments we employ in historical performance, and just as a ruler is graduated in millimetres, so our electronic tuners are graduated in cents. The reason that the cent is needed, incidentally, is that it is the only unit which remains the same for the same interval over the whole musical range. Herz double at the octave, so that no two adjacent equal semitones can have the same number of herz, and while ratios do remain the same, once they get above two figures, their relative sizes become incomprehensible to most of us.]

One reason for providing these programs is that while our electronic pitch meters, such as the Korg, are graduated in cents, our frequency counters register in herz (the modern term for

frequencies, *vibrations doubles*, etc) and some of us need to be able to convert from the one to the other. Another is that, while all these tasks are easily carried out with a pocket calculator, sometimes we want a written record of the results, and unless we have one of those calculators with a printer and a paper roll built in, we have to scribble the results while we work the machine. These programs will print out their results if you ask them to do so.

The programs were written in Basic for the Amstrad PCW. While they ought to run on any machine on which Basic is available, they may need adapting to fit the idiosyncracies of your computer. Obviously you can call them by whatever names are most memorable for you; I have named them by the direction in which they go. You are very welcome to use them and to pass them to your friends and colleagues. There are four of them (there are two others which convert herz to ellis and vice versa, but these are only useful to those of us who deal with non-European scales; they will be published elsewhere in due course [in the forthcoming papers of the Ellis Centenary Conference in Belfast last year], but if you feel that you need them in the meanwhile, let me know and I'll send you copies):

HERZCENT This is to convert herz or ratios to cents; I use herz more often than I use ratios and anyway you can only have eight letters for a name in CP/M.

Wherever you see INPUT the program will ask you a question; these are the only lines that you have to do anything on when you are running the programs. After you type in the answers, hit the RETURN key.

Line 20 is answered "y" or "n" (and similarly to that question in each of these programs) [I am going into detail because if you are as ignorant about computers as I am, but like me you have a machine or access to one, you can always get a friend to set the program up for you; if so, make sure you have a **written** note of how to get into it and out of it - written because one forgets these things very easily].

Line 30 is answered with the herz figure you want to convert or with the larger figure of a ratio.

Line 50 is answered with the smaller figure of a ratio or with your base herz figure (207.5 for the central octave at A=415; 220 for A=440, and so on).

The rest is automatic and the answer comes before you can blink. The reason for all the ### in line 90 is that if you don't put that into the program you will get answers with large quantities of decimals, and I assume that none of us is interested in thousandths of a cent or, in the next program, of a herz.

When you finish, push RETURN. If you are then asked whether you want to redo, or anything else which sug-

gests that the program wants to go on whether you want it to or not, enter 0.

CENTHERZ You may want to change line 20, which you can do either when you first type the program into your computer, or by using "edit", when you use it. I work on A=440 more often than A=415 or any other base, so it's easier to have 220 built in and change it if I need to.

Line 40, obviously, you type in the cents figure.

CENTSCAL This is like HERZCENT but provides for a whole scale printed out in cents as a continuous operation. Your inputs are much the same, with the provision for the insertion of "Werckmeister 3" or whatever (a nice list without any identification won't be much use in a week's time when you've forgotten what it was), and to tell the program how many notes there are in the scale. The print option is lower down because you may not want to decide whether to keep what you are doing until you have seen it on the screen.

Line 80 you type in the figure for the cents of your first step and then press RETURN; the program will then ask for the next figure, and so on to the end.

HERZSCAL This is like CENTHERZ, again with provision for a whole scale printed out, this time in herz. Again line 80 repeats automatically for each pitch of the scale.

Once you've got any or all of these typed in, try them out with something that you know the answer for, to see whether they work, such as 702 cents or 330 Hz or an equal-tempered scale or something. If they do work, remember to "save" them or you'll have wasted your time! If you forget their names (which is easily done), DIR on that disc should list them.

HERZCENT

```
10   REM herz to cents
20   INPUT "do you want to print"; hardcopy$
30   INPUT "input larger"; larger
40   IF larger = 0 GOTO 110
50   INPUT "input smaller"; smaller
60   ratio = larger/smaller
70   cents = 1200*LOG(ratio)/LOG(2)
80   PRINT "cents = "; cents
90   IF hardcopy$ = "y" THEN LPRINT USING "Herz - ####.# :
     cents - ####"; larger, cents
100  GOTO 30
110  END
```

CENTHERZ

```
10   REM cents to herz
20   base.herz = 220
30   INPUT "do you want to print"; hardcopy$
40   INPUT "input cents"; cents
50   IF cents = 0 GOTO 110
60   ratio = 2↑(cents/1200)
70   herz = ratio*base.herz
80   PRINT "herz = "; herz
90   IF hardcopy$ = "y" THEN LPRINT USING "cents - ####" : herz
     - ####.#"; cents, herz
100  GOTO 40
110  END
```

CENTSCAL

```
10   REM scale herz to cents
20   INPUT "name of scale"; name$
30   INPUT "base herz"; smaller
40   INPUT "number of notes"; number.steps
50   DIM larger(number.steps)
60   DIM cents(number.steps)
70   FOR x = 1 TO number.steps
80   PRINT x;
90   INPUT larger(x)
100  NEXT
110  PRINT name$; "base herz "; smaller
120  PRINT " herz " , " cents "
130  FOR x = 1 TO number.steps
140  ratio = larger(x)/smaller
150  cents(x) = 1200*LOG(ratio)/LOG(2)
160  PRINT larger(x), cents(x)
170  NEXT
180  INPUT "do you want to print"; hardcopy$
190  IF hardcopy$ <> "y" THEN END
200  LPRINT name$; " base herz "; smaller
210  LPRINT
220  LPRINT " herz        cents "   [instruction to programmer:
     LEAVE 6 SPACES BETWEEN HERZ & CENTS]
230  LPRINT
240  FOR x = 1 TO number.steps
250  LPRINT USING "####.#    ####"; larger(x), cents(x)
260  NEXT
270  END
```

HERZSCAL

```
10   REM scale cents to herz
20   INPUT "name of scale"; name$
30   INPUT "base herz"; smaller
40   INPUT "number of notes"; number.steps
50   DIM larger(number.steps)
60   DIM cents(number.steps)
70   FOR x = 1 TO number.steps
80   PRINT x;
90   INPUT cents(x)
100  NEXT
```

```
110  PRINT name$; "base herz "; smaller
120  PRINT " cents " , " herz "
130  FOR x = 1 TO number.steps
140  ratio = 2↑(cents(x)/1200)
150  larger(x) = ratio*smaller
160  PRINT cents(x), larger(x)
170  NEXT
180  INPUT "do you want to print"; hardcopy$
190  IF hardcopy$ <> "y" THEN END
200  LPRINT name$; " base herz "; smaller
210  LPRINT
220  LPRINT " cents   herz "  [instruction to programmer: LEAVE
     4 SPACES BETWEEN HERZ & CENTS]
230  LPRINT
240  FOR x = 1 TO number.steps
250  LPRINT USING "####    ####.#"; cents(x), larger(x)
260  NEXT
270  END
```

It has been suggested that if you built these into a spreadsheet, you would be able to shift things around to see, for example, what difference it would make to the pitch of various notes in meantone or other temperaments (obviously it makes no difference in equal temperament) if you start your tuning schema on C instead of A, or on F or G and so on. This could be useful in working out why a certain instrument is sharp on one note and flat on another; it might have been designed for a B flat centre, for instance. If you are going to do this, it may be useful to know that the formulæ on which they are based are:

HERZCENT & CENTSCAL: $Cents=1200(\log_2 r)$. $\log_2 r=\log_{10} r/\log_{10} 2$

CENTHERZ & HERZSCAL: $r=2^{1200/c}$

where r = larger/smaller or Hz/base Hz

I hope that they will prove useful.

What Should Measuring Tools Be Made Of?

Shall we ever come to a definite decision? I doubt it. CIMCIM has been supposed to be discussing for some years this question of with what tools we should allow people to touch our instruments, but I doubt whether there will ever be an agreed consensus among all its members. Makers (most of whom inevitably are also measurers) of course discuss the matter among themselves, but again there's unlikely ever to be a consensus, with everybody agreeing that a certain material or type of tool will not only be safe for the instruments but also reliable and accurate. There was some discussion on this subject at the CIMCIM meeting in Oxford a few years ago, and then Cary Karp, in response to suggestion from me that plastic was probably fairly safe, said that nothing was safe (I quote from memory and probably inaccurately) but that all that one could do was to choose the least dangerous. And that is what I want to discuss here, initially as a response to a query from Sally Lucas at the conclusion of our Bate Traverso Weekend last night on what materials and tools would I permit her to use here.

When Ken Williams came here to draw plans, and therefore to measure many instruments in the Bate Collection, we did of course discuss the tools that he was intending to use. I spoke for plastic; he said, and to a great extent he convinced me, that a careful measurer using good quality steel tools might cause less damage than a careless measurer using plastic, and conversely that a clumsy measurer with plastic tools would certainly cause a great deal of damage. What is more, he introduced me to the Mitutoyo T-gauges, which are certainly a good deal safer than the English gauges which I was accustomed to, since they are very highly polished, and thus are very smooth, and have rounded edges to their ends which merge imperceptibly into the sides, without any corners or sharp edges. He did not, of course, intend to allow these gauges to spring out into the bore (a point which I discussed recently in these pages with Charles Stroom [Comm. 639]) but to set them to a measured width before inserting them into the bore. However, Paul White showed me the latest Mitutoyo catalogue the other day, which included T-gauges with dials; if one were to allow such gauges to be sprung into the bore, and then retracted into the T (which would imply pressure on a spot in the bore), one could read off diameters greater than the open end of the bore, ie the downward bore of a bassoon butt. I'm still very wary of that as an idea, but it does open a number of possibilities to the measurer. I haven't yet seen the actual tools; if Paul gets round to buying some, I'll ask him to report on them in a future Comm.

So, are these gauges any better than the oval plastic discs which other measurers use? It depends on the discs, of course, but to my mind, unless the discs also have edges which are hemispherical in section, and which also merge imperceptibly into the flat surfaces, the T-gauges are safer. It is worth bearing in mind that unless the measuring tool is softer than the wood, there must always be a risk of damage, and if it is softer than the wood, it isn't going to measure accurately.

From the measurer's point of view, the smaller the point of contact with the bore, the more likely the measurement is to be accurate. A disc must be at least oval, since a round disc will measure only minimum diameters (on the assumption that the bore is oval, which it usually is), and an oval of any width at the ends of the longer axis will miss or ignore the full width of the bore, ie there will be small air spaces beyond the ends of the disc. So from that point of view, the T-gauge is preferable, unless the discs are very narrow ovals, narrower than most that I've seen.

So how about a very narrow disc? This could be the answer, perhaps, especially to the specific problem which Sally put to me, that of what to use to measure oboes, since there are no T-gauges to my knowledge which can be used in the narrow end of an oboe bore. Rather than a disc, I suggested an egg (though not necessarily with a wide and a narrow end), something solid enough that the ends could indeed merge perfectly smoothly into the sides (this is one problem with a thin disc; can the edges be truly hemispherical in section so that there is no trace of a cutting edge, of a vertically cutting reamer?). A set of these at whatever long-axis measurement apart is desirable, might be tolerable to both parties.

What should they be made of? To my mind of whatever will take and retain the highest polish and the greatest smoothness. Nylon, maybe, among the plastics, or perhaps even better would be teflon (I have some horn and trumpet mouthpieces with teflon rims, something devised by a friend in America back in the late 1960s or so, which are very smooth indeed, but whether teflon is dimensionally stable, I don't know). Ivory is another possibility (there's plenty of scrap ivory around and one does not need to shoot an elephant; chopping up a billiard ball would give one quite a large set) before one starts to look at metal. Among the metals, aluminium is a possibility; it's softer than several of the hard woods.

Dimensional stability isn't an essential quality anyway; one can, and indeed should, check one's gauges as one uses them. As Ken Williams pointed out to me, one should check one's measuring gauges too. At his suggestion, I acquired from my local garage some old roller bearings from cars and measured them, doing so with several tools so that there was a good cross check, and these rings (a roller bearing, for those who do not know them, consists of two concentric rings with a ball race between them; one takes them apart and obtains two rings, one larger than the other) I carry with my caliper gauges and use to check them from time to time. I also use them now to check the gauges of anyone who comes to the Bate to measure anything.

Would such eggs (as they get wider, they'd be more like bars of course) be safe in our instruments? Well, no, not just like that. The real question is, would the instruments be safe in the hands of the measurer who uses them? One has to watch how someone gets down to work, how carefully they seem to feel whether they have just made contact with the walls of the bore, or whether they just ram the tool in. This is where we come back to the beginning. It isn't so much the tool as the person behind it. Bound up with this is the question of how tough are

we as museum curators. Have we the guts to say to someone who has come perhaps three or more thousand miles to measure our instruments "*stop that, pack up and get out*"? I don't know; I haven't had to do it yet, but I hope that I would have the courage to do it if it were necessary. This, of course, is where the museums who have a firm and fixed no hands-on contact with the instruments policy are in the best position. They can't lose. The trouble is that the community as a whole does lose. I don't need to state my own position in the discussion of whether instruments should be measured, used, or whatever; for one thing, it's well enough known, and for another I would not be Hon.Sec. of FoMRHI if I didn't believe in making reconstructions (call them what you will) of original instruments and then playing them in early music performances (early music can, and soon will, run up to Elgar and Stravinsky -- wouldn't it be interesting to hear *Sacre* played on the sort of instruments used in Paris in 1913?).

I would be interested in your reactions to this Comm, both from measurers and from fellow curators. I'd be particularly interested in reactions, too, from people working with string instruments (we have very few, and so far nobody has asked to measure any, though I think that there may be some requests coming up to measure bows in the Retford Gift and Memorial Collection) and with keyboards. The whole of this Comm, down to this paragraph, applies exclusively to woodwind, which are all that anybody has measured here since I've been Curator. What does one use on a violin, for instance, that (assuming that one cannot take it apart) will allow access all areas of the belly and the back without causing any damage to the edges of the f-holes or to anything on the inside, including the label, or to the varnish? What does one use on a keyboard instrument, again without opening it?

I'd also be very interested in any ideas on how to measure brass instruments (including bassoon crooks); this is something that has come up, but neither the interested maker nor I could think of any way of doing the job. Look at my Comm. 722 in the last Q on the Nuremberg horns and try to think of a tool which will get round one of them, something over four metres long and well under 5 mm in diameter and capable of travelling round a triple or quadruple coil under the measurer's control without causing any abrasion or other damage.

The one tool which hasn't been discussed in this Comm. is Rod Cameron's chart recorder and strain gauge. This is for two reasons: a) the Bate Collection cannot afford to buy one as yet, and nor can most makers; b) Rod always says that results gained by it should be checked by mechanical means. From what I've seen of Rod using it, it is safe on instruments; there is contact, of course, but it is far lighter contact than with any other tool I've seen; in fact, I'd go so far as to say, in contradiction to Cary's remark quoted in the first paragraph of this Comm, that it is actually safe to use. Can its accuracy be improved? That's up to Rod, but with careful use, I think that it can; with very careful calibration initially and with every change of gauge size (a long and boring job), and used slowly and carefully so as to eliminate any chance of the gauge bouncing in the bore, perhaps always with at least two passes

on each chosen axis (this reduces the usefulness of photocopies of the resulting chart, which would not show the different colours of each pass; obviously one changes ink colour for each one). However, until we can all afford one of these machines, or of a similar machine which would produce a digital read-out which could be fed straight into a computer, we are likely to go on discussing this question. Over to you.

FOMRHI Comm. 734 R. White

Helpful Recordings

Other instrument makers may have to depend on recordings, as I do, for studying famous instruments or their 'copies' and learning how they sound. A recording session demonstrates that probably we are misled. If you try it you will find that the microphones near a harpsichord need only to be altered a few inches in position for big changes in the recorded sound of the instrument. Unless this experiment is made, the extent of the changes may be underestimated considerably: it is far from being a subtle one.

I heard recently the master-tape of a recording of two harpsichords, an original Kirckman and a 'Nachschöpfung' of a Ruckers, the latter by Mr. Derek Adlam, both played neatly by Ms. Maggie Cole. I admired the 'Ruckers' much more than the Kirckman. The recording engineer, Dr. David Wilkins, explained that the microphones were kept in exactly the same position relative to each instrument in turn, and the controls in the recording booth were not altered. When the records/cassettes from the master-tape are issued (Amon Ra label) they will be useful to have.

Mr. Malcolm Rose and the BBC compared, in the same way, brass with iron stringing of a virginal a few years ago in a radio programme. There is a record of Goble harpsichords in the style of Ruckers, Dulcken and Zell, which conveys emphatic differences between the instruments, but microphone positions and booth controls may or may not have been kept constant. Again, Ms. Cole plays.

The engineer is powerful and he usually must aim at some flattery of the instruments, for obvious reasons. A carbon microphone was used for enhancement of the bass when Mr. Michael Thomas, long ago, was recorded playing a clavichord. When Mr. Thomas told me and played the actual clavichord to me, the sound was quite different from the recording, though still it sounded a beautiful instrument.

If FOMRHI members, including museum curators, know of records made as carefully as Dr. Wilkins' master-tape, the information will be worth receiving, and especially so for stay-at-homes like me. May there be a list in the next Q perhaps ?

1986 FoMRHI List of Members - 1st Supplement as at 9th July 1986

*** in left-hand margin = change of address or other change**

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* **Friedemann Hellwig**, Rheinisches Museumsamt, Abtei Brauweiler, Postfach 2140, D-5402 Pulheim 2, West Germany; *02234/805-330*.
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Michael Nagy, Mölker Bastei 8/11, A-1010 Wien, Austria; *0222/632526* (all instrs, esp. fag).
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Norman Sohl, 832 Glass Ave, Olympia, WA 98506, USA; *943-6697* (early ww; M,P).
Hugh Spencer, 267 Cordeaux Road, Mt.Kembla, NSW 2500, Australia (wind instrs, bgpp, orgn, barrl-orgn; M,R).
Edward H.Tarr, Trompetenmuseum Bad Säckingen, Trompeterschloss, Postfach 1143, D-7880 Bad Säckingen, West Germany; *07761/51311*.
* **Marco Ternovec**, (gamba; M).
* **Geza Vojnic**, Aleja M.Tita 23-1, 24000 Subotica, Yugoslavia.
Martin Venner, Sudetenstr.7, D-6415 Petersberg, West Germany (trav, recrdr; M,C,R,P).

Brian Woods, 20 Cornbury Road, Edgware, Middx HA8 6RT, UK; *01-952 8899* (trav, recrdr, fag. gamba; P).

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ORGANOLOGICAL INDEX

Museums:	Bad Säckingen:	Trompeten *(Ed Tarr)*	
All Instrs:	Cajsa Lund	Michael Nagy	
All Perc:	Edmund Bowles		
String Instrs:	Christopher Allworth		
Strings:	David Kerr	**Dulcimer:**	Gillian Alcock
Keyboards:	Ian Watchorn	**Piano/Fortep:**	Kenneth Mobbs
Harpsichord:	Gillian Alcock, h	Kenneth Mobbs, h	
Lute:	Wolfgang Hiller	Ian Watchorn	
Guitar:	Ian Watchorn		
Violin fam:	Ian Watchorn	David Kerr	
Gamba:	Marco Ternovec	Ian Watchorn	Brian Woods
Wind Instrs:	Hugh Spencer	**Woodwind:**	Norman Sohl
Traverso:	Andrew Crawford Sand Dalton Paul Jacobson	Terry McGee Jonathan Shorland Martin Wenner	Brian Woods
Recorder:	Sand Dalton Paul Jacobson	Martin Wenner Brian Woods	
Whistles:	Terry McGee	**Organ:**	Hugh Spencer
Pibcorn:	Jonathan Shorland	Oboe:	Sand Dalton
Bassoon:	Sand Dalton	Michael Nagy	Brian Woods
Bagpipes:	Hugh Spencer	**Trumpet:**	Edward Tarr

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GEOGRAPHICAL INDEX

Australia:	Gillian Alcock, ACT	Terry McGee, ACT	Hugh Spencer, NSW
Austria:	Michael Nagy		
Belgium:	Lode Bauwens		
Canada:	Christopher Allworth		
West Germany:	Wolfgang Hiller	Edward Tarr	Martin Wenner
Sweden:	Cajsa Lund		
UK:	Kenneth Mobbs, Avon	D. Kersham, Lancs	
London:	Joseph O'Kelly, E8	Andrew Crawford, W3	
	Brian Woods, Middx	Jonathan Shorland, Wales	
USA:	S.& C. McAllister, CT Sand Dalton, MA	Paul Jacobson, MN Ed Bowles, NY	David Kerr, OR Norman Sohl, WA

FoMRHI Comm. 735

HAPPY TRANSPOSITION ?!?

Nicolas Meeùs

Richard Shann claims in Comm. 718 that the Ruckers doubles were contrasting doubles and that 'the arrangement of the keyboards (a fourth apart) is the natural one'. I persist believing that this arrangement is 'the important and the most puzzling feature' of the instrument, as I wrote in Comm. 680, and that it is the feature that needs an axplanation. To describe it as 'natural' explains nothing.

Contrasts within a piece could have been obtained on a Ruckers double only between an 8' and a 4', as the same register cannot be 'on' on both keyboards at the same time. The arrangement of the keyboards would have made it necessary to transpose the parts of the piece that were to be contrasted with the rest, which is awkward. Playing with one hand on each keyboard would have imposed a tricky kind of bitonal playing. If on the other hand the purpose had been of producing contrasts between pieces or between sections of a piece, then changes of registration would easily have achieved the desired result and the second keyboard would have been unneeded.

My purpose now is not of entering a controversy about this, however. Rather, I would draw attention to one of Richard's statements, that 'the vast majority of pieces ca 1600 can be happily transposed without exceeding the limits of the meantone system'. This is almost the exact negation of a basic idea behind my conception of the Ruckers doubles, namely that the meantone system imposes drastic limitations to the 'transposability' of the pieces. My idea on this point resulted from a general consideration of the problem rather than from a detailed statistical analysis of the répertoire. Richard's statement prompted a reexamination of the matter, with provisional results about which I would like to report here.

A thorough examination of the late 16th- of early 17th-century repertory may become the subject of a large scale study. For the time being I restricted my analysis to two sets of pieces which I thought particularly relevant to the matter under discussion, the collected works of Peeter Cornet (in CEKM 26) and the pieces by Peter Philips in the Fitzwilliam Virginal Book. Peter Philips (c1560-1628) settled in Antwerp in 1590; like his colleague Peeter Cornet (c1575-1633) he has been organist to the archiducal Court of Brussels. Probings in other sets of pieces shew that the 30 pieces examined are reasonably representative of the repertory as a whole.

The relevant data are listed below for the 30 pieces considered. From left to right are given (1) the number under which each piece will be refered to hereafter; (2) the title of the piece; (3) its range, including details of the notes used in the low octave; (4) the 'flattest' and the 'sharpest' notes that it includes (editorial accidentals not considered).

A. COMPOSITIONS BY PEETER CORNET			
1.	Fantasia del primo Tono	CDEFGAB♭B-a²	e♭-g#
2.	Fantasia del 2° Tono	DEFGAB♭B-a²	e♭-c#
3.	Fantasia 3. Toni	DEFGAB♭Bc-a²	b♭-g#
4.	Fantasia del 5° Tono (incomplete)	CDEFGAB-a²	b♭-g#
5.	Fantasia 8° Toni	CDEFGAB-g²	b♭-g#
6.	Fantasia	CDEFF#GAB-a²	f-g#
7.	Toccada del 3° Tono	CDEFGAB♭-a²	b♭-g#
	NB. This piece includes 'short octave chords'		
8.	Salve Regina	DEFGAB♭B-a²	b♭-g#
9.	Tantum ergo	EFGAB-e²	b♭-g#
10.	Courante	CEFGAB-b♭²	f-g#
11.	Courante	DEFGAB-e²	f-c#
B. COMPOSITIONS BY PETER PHILIPS			
12.	Tirsi. Di Luca Marenzio. 1a Parte	DGAB-g²	f-g#
13.	Freno. Seconda Parte	DEGAB♭B-g²	b♭-g#
14.	Cosi moriro. 3a Parte	CEFGAB-a²	b♭-g#
15.	Fece da voi	CDEFGAB-b♭²	b♭-g#
16.	Pavana Pagget	CFGAB♭B-g²	e♭-f#
17.	Galiarda	CFGAB♭B-g²	e♭-f#
18.	Passamezzo pavana (1592)	CDEFGAB♭B-a²	e♭-c#
19.	Galiarda passamezzo	DEFGAB♭B-a²	e♭-g#
20.	Chi fara fede al Cielo, di Alessandro Striggio	GABcc# d-a²	b♭-g#
21.	Bon Jour mon Cueur di Orlando (di Lasso) (1602)	DFGAB♭ B-a²	e♭-g#
22.	Pavana Doloroso. Tregian (1593)	CDEFGG#AB-g²	e♭-g#
23.	Galiarda Dolorosa	CDEFGAB♭B-f²	b♭-g#
	NB. These two pieces (22-23) include 'short octave chords'		
24.	Amarilli di Julio Romano (Caccini) (1603)	GAB♭B-g²	e♭-c#
25.	Margott Laborez (1605)	CDEFGAB-a²	b♭-g#
26.	Fantasia	GABcdeff#g-a²	b♭-g#
27.	Pavana (1580)	GABcc#d-a²	b♭-c#
28.	Le Rossignuol (1595)	FGABcde-g²	e♭-c#
29.	Galliardo	GABcc#d-g²	f-c#
30.	Fantasia (1582)	FGABcde♭e-b♭²	e♭-f#

The reader will easily deduce which transpositions are possible for each piece if he keeps in mind that the factors that may limit the transposability include:
- the limits of the keyboard range available;

- the fact that the meantone system permits certain chromatic notes only;
- the fact that no chromatic notes are available in the low octave of the keyboard (the short octave);
- in a few cases (n°° 7, 22 and 23 in the list above), the compositions include chords and successions of chords in wide dispositions playable on the short octave only.

. . .

Let's first check the hypothesis that the Ruckers doubles were contrasting instruments. This is possible only if the pieces are playable at the same pitch on both keyboards - that is, in keys that are a fourth apart. Several possibilities must be considered:

- the piece is played as notated on the upper keyboard and in a key a fourth higher on the lower keyboard. This is possible for n°° 3 to 6, 8 to 15, 20, 25 to 27 and 29 of the list (57%).

- the piece is played as notated on the lower keyboard and in a key a fourth lower on the upper keyboard. This is possible in theory only. Indeed, the limitations resulting from the short octave are so severe that this solution is applicable to none of the pieces examined. As a variant of this solution one might consider the possibility that a piece be played as written on the lower keyboard, a fifth higher than written on the upper keyboard; this is possible for n° 11. If one played with the 4' on the lower keyboard and the 8' on the upper, the piece would sound at the same pitch on both keyboards. Note however that n° 11 can also be played as described above.

- the piece is played in two keys a fourth apart, none of which is the notated key. This is possible for six pieces (20%), either playing a fourth higher than notated on the upper keyboard and a seventh higher on the lower one (n°° 11, 12 and 29) or playing a tone higher on the upper keyboard and a fifth higher on the lower one (n°° 16, 17 and 30). Note that n°° 11, 12 and 29 can also be played as described above.

- a contrasting use of the Ruckers double is not possible for n°° 1, 2, 7, 18, 19, 21 to 24 and 28 (33%) unless it is restricted to certain parts of the pieces.

The important point about all this, the only point I want to make, is that none of these restrictions would have existed if the keyboards had been aligned. I am ready to admit that Ruckers doubles may have been used at times as contrasting instruments, but this by no means explains why the keyboards were a fourth apart.

. . .

The transpositions possible in meantone for the 30 pieces examined are tabulated below. The figures -5, -1, ... +5 refer to transpositions down a fifth, down a tone, ... up a fifth respectively (-4 is not used because none of the pieces can be transposed down a fourth; transpositions an octave higher than some of those indicated, possible in a few cases, have not been considered). It has been assumed that these transpositions are performed on a keyboard with C/E short octave. Whenever a transposition is possible for a given piece, the upper limit of the keyboard necessary to perform it is indicated in the column corresponding to that transposition; three upper limits only have been considered, c^3, d^3 and f^3, so that the indication 'c^3' means that the piece can be transposed as indicated on a C/E-c^3 keyboard, but the transposition might also be performable on a narrower keyboard. The indication 'd^3' means that a C/E-c^3 keyboard would not suffice for the transposition indicated, etc.

	-5	-1	+1	+4	+5
PEETER CORNET					
1. Fantasia del primo Tono					
2. Fantasia del 2° Tono					f^3
3. Fantasia 3. Toni				d^3	
4. Fantasia del 5° Tono				d^3	
5. Fantasia 8° Toni				c^3	
6. Fantasia				d^3	
7. Toccada del 3° Tono					
8. Salve Regina				d^3	
9. Tantum ergo				c^3	
10. Courante				f^3	
11. Courante		c^3		c^3	c^3
PETER PHILIPS					
12. Tirsi		c^3		c^3	
13. Freno				c^3	
14. Cosi moriro				d^3	
15. Fece da voi				f^3	
16. Pavana Pagget			c^3		d^3
17. Galiarda			c^3		d^3
18. Passamezzo pavana					d^3
19. Galiarda passamezzo					
20. Chi fara fede al Cielo				d^3	
21. Bon Jour mon Cueur					
22. Pavana Doloroso					
23. Galiarda Dolorosa					
24. Amarilli					d^3
25. Margott Laborez				d^3	
26. Fantasia	c^3			d^3	
27. Pavana				d^3	f^3
28. Le Rossignuol					d^3
29. Galliardo		c^3		c^3	d^3
30. Fantasia			c^3		f^3

It must be noted that some of the pieces in the list belong together and should better be considered together. N° 18, for instance, should be considered as untransposable because n° 19 is untransposable. On the other hand I have considered that a transposition was impossible if it required chromatic notes in the short octave. However n°° 6 and 22 as written already request an F# and a G# respectively (see table 1). This raises a question that cannot be discussed here. To take these problems into account would have led farther than is useful in this communication, probably without significantly modifying the general statistical value of my conclusions.

From the table above, it is easy to deduce how many different keys are possible for each piece on various types of instruments. The ones considered below are (1) single harpsichord with C/E-c^3 keyboard; (2) single harpsichord with C/E-d^3 keyboard; (3) Ruckers double with C/E-c^3 and C/E-f^3 keyboards. For the single harpsichords, I discuss keys rather than pitches, as the actual pitches will depend of the pitch of the instrument; the transposed keys are refered to the notated key ('K'). For the double, the pitches are related to the 'reference pitch' ('R'), i.e. that of the upper keyboard; in some cases, the same pitch may be available on both keyboards, in two different keys.

<u>C/E-c^3</u>
- 20 pieces (67%) cannot be transposed and must be played in K (i.e. the key in which they are notated).
- 7 pieces (23%) can be played in two different keys, K and K-5 (n° 26), K and K+1 (n°° 16, 17 and 30) or K and K+4 (n°° 5, 9 and 13).
- 2 pieces (n°° 12 and 29) can be played in three different keys, K-1, K and K+4.
- 1 piece (n° 11) can be played in four different keys, K-1, K, K+4 and K+5.

<u>C/E-d^3</u>
- 9 pieces (30%) cannot be transposed and must be played in K.
- 16 pieces (53%) can be played in two different keys, K and K+1 (n° 30), K and K+4 (n°° 3 to 6, 8, 9, 13, 14, 20 and 25 to 27) or K and K+5 (n°° 18, 24 and 28); n° 26 can also be played in K-5, which is the same as K+4.
- 3 pieces can be played in three different keys, K-1, K and K+4 (n° 12) or K, K+1 and K+5 (n°° 16 and 17).
- 2 pieces (n°° 11 and 29) can be played in four different keys, K-1, K, K+4 and K+5.

<u>Double</u>
- 15 pieces (50%) can be played at two different pitches, R and R-4.
- 9 pieces (30%) can be played at three different pitches, either R-4, R and R+1 (n°° 2, 18, 24, 27 and 28) or R-4, R and R+4 (n°° 5, 9, 13 and 26; 26 actually at R-8, R-5, R-4 and R, which is equivalent).

- 4 pieces (13%) can be played at four different pitches, either R-4, R-3 (minor 3d), R and R+1 (n°° 16, 17 and 30) or R-5=R+4, R-4, R-1 and R (n° 12).
- 2 pieces (7%) can be played at five different pitches, R-5=R+4, R-4=R+5, R-1, R and R+1 (n°° 11 and 29).

. . .

To sum up:

The meantone system does impose drastic limitations on the transposability of the vast majority of pieces ca 1600. The Ruckers double significantly reduces this difficulty, roughly doubling the number of possible transpositions. (If this is of any meaning, the average number of keys or pitches possible per piece in the répertoir examined is 1.4 on a C/E-c^3 keyboard, 1.9 on a C/E-d^3 keyboard, 2.8 on a Ruckers double; it would be 2.1 on a C/E-f^3 keyboard). None of the pieces considered can be transposed down a fourth, either because they include a g# as written or because of the short octave; it is an interesting coïncidence that the first transposition made possible by the arrangement of the keyboards in a Ruckers double is precisely down a fourth (relative to the 'reference pitch').

FoMRHI Comm. 736

More on the Proportional Compass

Richard Shann

This Comm. is in response to the Comm. 704 of Remy Gug. Firstly, however, let me say that I heartily agree with a comment in his Comm 666, a few pages of historical documents are worth volumes of armchair speculation; the more historical data FoHMRI can publish the better. Only when we share common information can we debate what the data means, and hopefully arrive at a good understanding of history.

The quotes in Comm. 704 are very helpful in clarifying the extent to which academic learning impinged on craftsmen. Consider Xylander's comments concerning the craftsman who "does not learn his art from the beginning", this is a weakness "which is quite common and evident as can be witnessed daily". I think we should take this quite literally: a lot of craftsmen knew only the practical details of their regular work (at least in mid-16th century Germany). At the other end of the spectrum were the masters who could innovate instrument design easily because of their learning. The passing on of knowledge from a master to his successor(s) surely varied from time to time and place to place. The more we know about this the better we can understand conservatism and creativity in instrument making.

It is perhaps natural that Remy Gug, a well-known harpsichord maker should choose the harpsichord to illustrate the use of the Linea Musica of the proportional compass. Unfortunately, this is one of the few instruments which the Linea Musica has little to offer. To see why this is so, we must first recall that the strings on harpsichords were traditionally laid out evenly spaced apart on smoothly curving bridges with the strings doubling in length for each octave. (Here we discuss only the higher part of the compass for which this last statement is true). Consequently, within the accuracy of pinning, adjacent semitones have string lengths in the ratio 1.059. So the Linea Musica of the Sector as described by Scheffelt[2] (1708) would not be useful since it gives an irregularly tempered scale.

Mersenne[3] gives a Harmonic Line which he recommends for placing the frets on viols, as follows:

Here it is only columns I and III that concern us. Column I is the notes and III the divisions to be made on the arms of the proportional compass. These have the right proportions for a harpsichord treble, but this part of the compass could have been done as easily with a simple stick marked out with equal intervals. (The quint, octave etc instruments would all use the same stick - they have essentially the same string lengths, called by different names.) Where a Sector could be used is if it were marked out with the tapered scale of the lower notes. By opening it out to the correct degree the differently pitched instruments could be accomodated. This compass would perhaps be too unwieldy for everyday use, however it could be used for making a set of rulers which had each note for a given size of instrument marked on them.

Ligne Harmonique.

I	II	III	IV	V
D	a	100000		
xd	b	188,770	11,130	b
E	c	178171	10599	c
F	d	168178	9991	d
xf	e	158740	9438	e
G	f	149829	8911	f
xg	g	141421	8408	g
A	h	133480	7941	h
b	i	125992	7488	i
x	k	118920	7072	k
C	l	112245	6675	l
xc	m	105945	6300	m
D	n	100000	5945	n

As a practical matter this method seems useful only for those harpsichords with removable nameboards, because they allow the ruler to stick out beyond the case when measuring the shorter strings. (This is a point which the advent of the flexible tape-measure has made less obvious.)

Remy specifically mentions the case of the Ruckers: here at least we are on firmer ground, since there is a reasonable amount of evidence as to their techniques. Firstly, Remy asks is it a coincidence that the length of the E string is 'exactly one Antwerp foot'. The coincidence is immediately weakened by being overstated - the Ruckers string lengths are not 'exactly' anything; O'Brien's tables[4] give an average of 280mm however, which is only 4mm short. Nevertheless, with so many strings, it is not surprising that one of them falls on some scale. The coincidence of this being an E-string and Scheffelt's table also starting at E seems none too strong: Mersenne's starts at D and he remarks that it could start on any note. Mersenne is closer in time to the Ruckers, of course.

The evidence regarding the Ruckers marking out techniques is as follows. Firstly - as pointed out by G. Grant O'Brien, the 14 duim c-string is 19 duim from the nameboard. From my more limited observations it seems that the corresponding 4' string was set 14 duim from the nameboard. In addition, it seems likely that the c and f# bridge pin positions were all marked on the soundboard by jabbing in with a sharp point and drawing it 1/2 inch across the soundboard. I say likely because these are invariably covered by the bridge in the treble, and I have not seen a Ruckers harpsichord with it's bridge off. Nevertheless these were the notes marked on the bottom when the full mark-out was done, and in the bass these marks can often be seen on the soundboard.

Seemingly it was quite permissible to let the strings get a bit shorter than their design values in the bass, with the result that the marks for the bridge pins are often visible on the soundboard between the bridge and the bentside, close to the bridge. (A string that is a little shorter will work ok, whereas if it were too long it might give trouble with breakages. One of the striking features of the Ruckers instruments is that the length of the instruments wasn't measured exactly. A good plank of wood for the spine of a harpsichord was not to be discarded for want of an inch or two in length.) The table shows the positions of these marks - with possibly a few accidental marks included.

Ruckers Soundboard markings

Instrument	Note	Distance (cm.) from Nameboard	Spine
6 voet AR	c'	83.2	33.6
Den Haag		53.2	32
short octave			
6 voet 1654	c'	83.5	31.6
Nurnberg		53.4	31.5
short octave			
6 voet 1636	c'	(88.5)	(43.2*)
AR chromatic		(123)	(25.9*)
		(58 or 58.3)	(41.5 or 42*)
			*less 4.4cm orig
6 voet AR	c'	83.5	32.3
163? short octave			
4 voet AR	c'	55.4	30.5
short octave			
8 voet AR	4' c'	64.5	30.4
1608	4'f#	51.5	38.6
short octave	8'c'	105	31
	8'f'#	79	39.8
8 voet IR	8' c'	105.9	32.2
1618	4' c'	65.2	31.1
short octave	4' c°	88.8 or 89.1	14.9 or 15.4
8 voet IR	4' c°	88.2	14.7
1638	4' c'	54.4	34.6
short octave	8' c'	105.7	31.4
8 voet AR	8'c'	n.a.	30.9
Pilkington	8'f'#	n.a.	38.9
short octave			

The majority of Ruckers harpsichords have only the basic markings out on the bottom. (That is the case sides (each drawn separately so they overlap) the braces, endblocks, nameboard, belly-rail and register projections.) Some however have more detailed markings: the most extensive that I have closely inspected is the 1636 6-voet AR single (now a French Double). In addition to the basic markings both sides of each nut and a line for the bridges is marked, and each c and f♯ string is marked in. Why should Andreas Ruckers suddenly embark on a spate of marking out, when it seems he could make the instruments perfectly well without? Evidently** this was part of the training of a future master craftsman. The initiate was being shown the art 'from the beginning', 'from a good and steady foundation' as Xylander[1] put it. Incidentally, for those that like a good coincidence, there is a simple relationship between the lengths of the c and f♯ strings and the distance between them (that is between the octave span and the scale! f'♯ = 3xoctave span.) The c and f♯ strings themselves are related by the square root of two, of course. At one time I made an isosceles right angled triangle up with one side equal to the Ruckers c, so that the other gave f♯. This was all that was needed for marking out the treble strings. However that leaves the bass to be tackled by a different route. A marked out stick (made perhaps with the aid of a sector) is a strong candidate, especially if it gave not string lengths, but distances to the belly rail, so that the soundboard could be marked out outside of the instrument.

**Ha! It took about four years before I tumbled to this obvious fact.

Acknowledgements: to Eph Segerman for pointing out the relevant passage in Mersenne, and Grant O'Brien for pointing out the existance of scratch marks on soundboards.

1) Comm 704 p.72
2) Comm 704 p.82
3) Mersenne 4th book Prop VII (Printed as IX)
4) G. Grant O'Brien Antwerp Colloquium (1977)

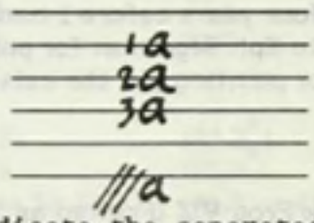
FoMRHI Comm: 737 Bill Samson & Martyn Hodgson

VON RADOLT'S INSTRUCTIONS TO LUTE PLAYERS (VIENNA 1701)

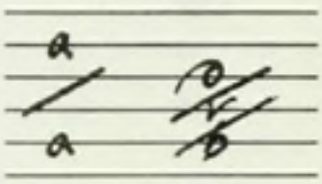
'Here follows the explanation of signs found beside the letters themselves.

At the beginning of the suites the first characters signify how the parts belong together, for example (A) where this A appears everything belongs to the first suite.

This sign indicates that one takes it with the thumb and three fingers of the right hand which will make the consonances and dissonances clearer than when they are brushed.

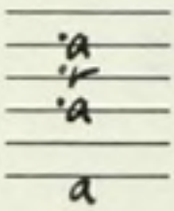


Strokes through the stave indicate the separated three notes.

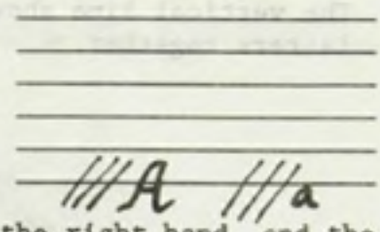


This reversed crescent indicates the "triller".

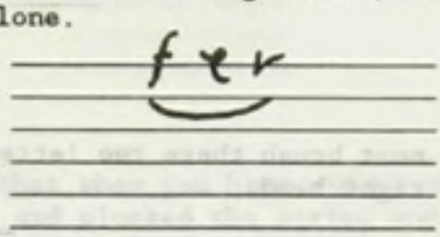
Where these little points are placed, everything should be brushed with the first finger.



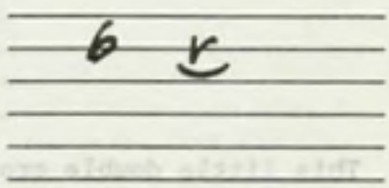
The big A signifies that you strike the bass alone and after that the little string according to the little a.



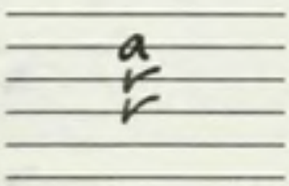
You must play the first letter with the right hand, and the others with the left hand alone.



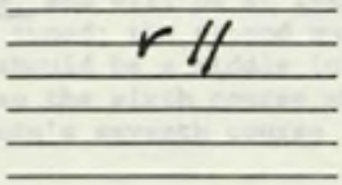
This sign indicates that you play the string with the right hand and thereafter fall with the left hand.



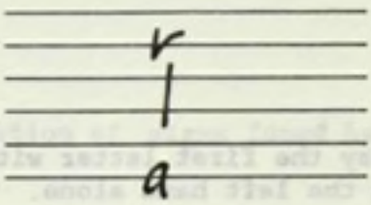
NB
The next chord which follows should be struck backwards with the first finger.



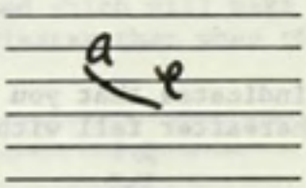
These signs indicate the "Etoufement" and are ordinarily used to show when a letter is to be struck twice, you play one string with the right hand and immediately stop it with the next finger, also of the right hand, through which you stop the sound.



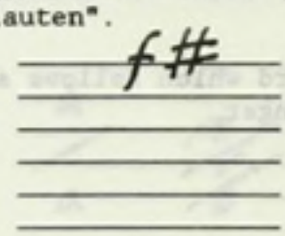
The vertical line shown here indicates that you strike both letters together.



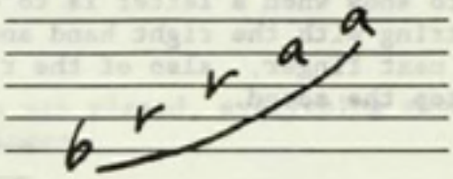
You must brush these two letters with the first finger of the right hand.



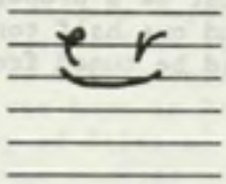
This little double cross signifies a firm stop, vibrating the finger, called a "Tremulauten".



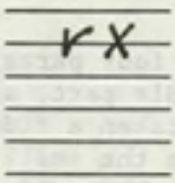
Where this line is, the first letter must be held with the left hand during the others which come after it.



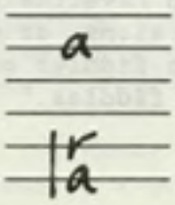
Here you must play the first letter with the right hand and pluck the other with the left hand.



The little cross signifies that when you have struck the string with the right hand: and plucked the string and hammered it several times with the left hand; known as "Martellement".

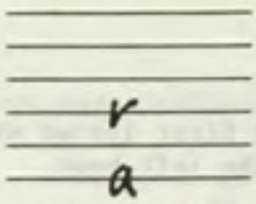


Where this line is you must strike both strings with the thumb.



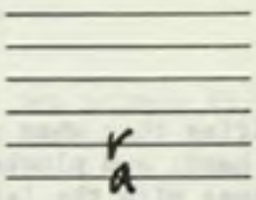
An introduction to the first lute "Concert", written in D la Sol re Primi Thoni is set out here. This piece is played using three different lutes: the first, taking the soprano part, must be a very small lute, and will be at least about half a tone higher than a cornet is tuned; the second must be somewhat bigger; and so there should be a middle lute tuned about a whole tone lower, and so the sixth course should be tuned the same as the little lute's seventh course

ie:



the third must be a proper, large common lute tuned two whole and one half tones lower and so this lute's sixth course should be tuned from the little lute's ninth course

ie:



This "Concert" is in four parts and so each lute part corresponds to a fiddle part, and because of the good high humour when one has taken a fiddle, a small basso fiddle and a bass all tuned from the small lute, in this "Concert" the soprano part that is the small lute must at all times be set strongly, and so when the second and third lute are doubled then the first should be at least tripled, however if the second and third lutes are single the first must be set doubled, making a particularly good effect when one part is played, accordingly. It is still complete when three single lutes are used with the other parts silent, in a similar way one can nevertheless one time expel all but the first lute playing alone, or with two lutes, and it may also be well played with fiddles or oboes without lutes or also with lutes without fiddles.'

COMMENTARY

Wenzel Ludwig Von Radolt (1667 - 1716) was a member of the minor nobility in the service of the Imperial court. His sole publication (Die Aller Trelleste .... Freindin, Vienna 1701) is dedicated to Joseph I and consists of five part books containing instrumental suites for various groupings of lutes, violins or flutes, viola or gamba and Bass.

The negligible musical worth of the work is overshadowed by its musicological and organological significance. For, after Von Radolt, no other player of the 11 or 13 course

lute was to describe performance practice and the types of lute in such detail. Accordingly, the instructions are not only of immense interest to us for the interpretation of Von Radolt's own music, but also that of his more celebrated Austrian and Bohemian contemporaries (Losy, Weichenberger, Lauffensteiner, et als). Of even more importance is the insight it provides into the performance style which must have influenced the greatest of all lutenist-composers: Sylvius Leopold Weiss. Weiss was born in Breslau (then part of the Hapsburg territory of Silesia) and was employed there until 1708 in the service of Count Karl Philip of the Palatinate.

The English translation is of folios 4v and 5 of the First Lute part and aims at a literal rather than a literary interpretation. The explanation of tablature signs is followed by a unique 18th century description of lute sizes and pitches and is invaluable in determining the correct size of the common lute. Most of Von Radolt's explanations are quite clear and correspond to graces described in similar terms in other sources. For convenience, they may be seperated into two types: those executed with the left hand and those with the right.

Left hand graces

The reversed crescent ('triller') is the ubiqitous sign found in almost all 17th and 18th century tablatures. It indicates an upper appoggiatura or an upper shake/trill.

The ascending and descending slurs and the half circle, indicating a lower appoggiatura, are also the usual contemporary signs and interpretations.

The little cross ('martellement') described by Von Radolt employs the sign used by a later generation to indicate a long shake/trill. However, Von Radolt does not appear to be describing this but rather a sort of repeated lower mordent. This interpretation is confirmed by the tablature which shows that this grace is never applied to an open string.

The 'Tremulauten' seems to be described as a finger vibrato, rather than a vibrato using the whole arm. However, Baron (Historisch-Theoretisch and Practische Untersuchung des Instruments der Lauten Nürnberg 1727) uses this same sign to indicate the arm vibrato and employs a different one to show a finger vibrato.

Right hand graces

Von Radolt employs the usual contemporary signs to show raking and brushing play and his explanations describe the same technique as used by earlier generations of French lutenists. However, he also lists a special sign to show a simultaneously plucked chord and it frequently appears in the tablature. This may be seen as a departure from the ubiquitous 'scratching' play associated with the French School and condemned by Mattheson and Baron in the early 18th century.

The use of special notation to differentiate between great and small basses is extremely rare, but may reflect an unwritten practice: perhaps first employed by the French to avoid booming basses (the practice is mentioned as a special effect in the Burwell lute book). Extant lutes indicate that the seperation of strings and between each course seems to have been reduced (from around 14/15mm to about 12mm) when the 13 course lute was introduced; presumably to keep the extreme course within the span of a hand. Thus, the performance of this particular ornament was rather more difficult on the 13 course instrument and it may not have been employed in later music with a more florid bass line.

String damping with the right hand fingers ('etoufement') is also rarely found in other tablatures. However, since its use is perhaps more concerned with phrasing and interpretation, it may have been employed by other players even when not shown in the tablature. Interestingly enough, Von Radolt does not mention this technique in relation to the thumb and there are no examples of the grace associated with bass notes in the tablature. Indeed, in some of the pieces with fugal entries, the upper parts have this grace indicated but there is no sign against the bass entries. The practice of habitually damping the basses, as practised by some modern players, is not, therefore, supported by this source.

Lute stringing

It is generally assumed that the doubled bass course on 18th century lutes were tuned in octaves (as with earlier French lutes). In fact, there are very few sources for the 11 and 13 course lute which even suggest this, with the result that some modern lutenists have been known to employ a unison on the 6th course to avoid the intrusion of the high octave when they are obliged to pluck this course with the fingers. It is therefore fortunate that Von Radolt's use of individual strings in the tablature shows quite clearly he had octaves on all the bass course, including the 6th.

The size and pitches of lutes

As mentioned in Comm 662, Von Radolt's description of the sizes of lutes and their relationship to a particular pitch is of enormous value. Especially important is his unequivocal observation that the largest of the instruments was the proper size for the common lute (in German speaking countries). Such an instrument would have an open string length of around 72cm and be pitched about a tone below modern (i.e. low Cammer-ton). The full relationship between the various sizes of lutes and their pitches as suggested by Von Radolt is given in the table below.

Lute type	Fingered string length	'Vienna' pitch	Approximate relation to modern pitch
Very small	54cm		+3 semitones
		Cornet-ton	+2 semitones
Middle	61cm	Chor-ton	+1 semitone
			0
		Cammer-ton	-1 semitone
Proper common	72cm	Tief Cammer-ton	-2 semitones

In Comm 683 Eph Segerman attempted to refute the speculations on pitch described in Comm 662. Whilst agreeing that the proper common lute would have been pitched about two semitones below modern, he thought that Von Radolt's comment 'dises Concert ist a Quatro gemacht' implied the ensemble played a fourth higher than 'normal' pitch and so proceeded to deduce that 'normal' pitch in Vienna was four semitones lower than 'Cornet'. In fact, Von Radolt is employing contemporary terminology to explain that the piece is written in four main parts and the instructions suggest that in Vienna, Cornet-ton would have been about two semitones above modern pitch with Chor-ton a little lower (about one semitone above modern).

 Martyn Hodgson

ON EXTENDED PEGHEAD LUTES

Once again the identification and classification of lutes with more than one linearly disposed peghead has surfaced (in Comm. 712). Those with an interest in the subject may care to recapitulate by reading Comms. 337, 338, 456 and 464 as well as quoted articles in other periodicals. In particular, they will note the undisputed organological superiority of the term 'extended peghead lutes' to describe these instruments over other, more misleading, terms (e.g. 'extended lutes' and 'two-necked lutes').

By and large there is a fair measure of agreement amongst most writers on this subject, except for some controversy surrounding Piccinini's (1623) version of history, continuing uncertainty as to the designation of instruments and one, suprisingly persistent, misapprehension about large Archlutes. I would, therefore, like to offer some observations on these matters and suggest an appropriate classification system.

The origin of the Chitarrone

In JAMS XXXII Douglas Alton Smith questioned Piccinini's record of the invention and development of the Chitarrone. Ephraim Segerman has since pointed out some of the flaws in Smith's case (Comm. 712) and similarly I also see no substantive reason to doubt Piccinini's history. In particular, I find his description of the earliest instruments to be perfectly convincing: the very earliest Chitarrones were merely Bass lutes with the first or even second course tuned down an octave. Certainly, some of the first tablatures to specify the Chitarrone contain remarkably little use of the low open basses (Rossi 1600, Kapsberger 1604) compared with those published only slightly later when, presumably, instrumental technique had accommodated the extra basses (Piccinini 1623, Kapsberger 1640).

Whilst the identity of the inventor of the Chitarrone is of historical interest, what is of rather more importance is the way in which the instrument developed and the implications this has for modern performance practice. An instrument, which did not possess numerous open bass courses (as the very earliest Chitarrones), would favour a more adventurous right hand technique than if the thumb was obliged to be disposed over such extra basses. Thus, whilst prefering the humanist inspired derivation of the name 'Chitarrone' and being sceptical about direct etymological links to 'Chitarra', I nevertheless see a strong case for the employment of more florid arpeggios and even guitar-like strumming techniques on the Chitarrone than is currently the vogue amongst most modern players. Indeed, some of the restrained, not to say repressed, continuo play of modern players sometimes makes me wonder why the Old Ones went to so much trouble if the instrument merely sounded like a Bass lute with a few extra bass courses.

In the absence of more convincing documentary or iconographic information, the existence of an extended peghead lute with a label pre-dating Piccinini's claim (Boston: 'Magno Diffobruchar a Venetia 1589') would seem to represent the only substantial piece of evidence against his record. However, the 1589 instrument tells us very little, other than makers have always modified lutes to keep abreast of changing fashions. Indeed, there is even one particular feature which may indicate that this instrument has been altered. Original lutes of this period usually had only 8 frets on the neck; the lengthening of necks to accomodate 9 or more frets seems to have occurred rather closer to the turn of the century (Dowland 1610). The 1589 instrument seems to have room for at least 9 frets, which suggests that it might have been built as a conventional Bass lute with 8 fret spaces and subsequently converted to a longer necked Theorbo. The presence of seven fingered courses also does nothing to help the dating (as Smith suggests) since later writers mention instruments with more than six courses (Praetorius 1619, Mace 1676) and they are to be seen in later iconography (Puget 1687). One final problem with the 1589 lute is that it pre-dates the experimental efforts inspired by Piccinini and executed in Padua by six years, yet it represents a fully developed form of the extended lute. I find it almost inconceivable that the Paduan makers had so little contact with their contemporaries in Venice that news of such an innovative instrument would not have reached them by 1595.

The classification of Archlutes

Allthough there is considerable doubt as to wether the 1589 Diffobruchar is in its original state, there is little doubt that it should not be called a 'Bass Archlute' as has been suggested, since all the available evidence indicates such instruments never existed (Comm. 464). Of course, Archlutes can vary somewhat in size (as large Theorbos can), but this is quite insufficient ground for assuming a different nominal pitch to any recorded. Only two nominal pitches are known: in G and (much rarer) in A.

In fact, the essential difference between the two main classes of Archlutes is the relative length of the open basses to the fingered strings (the Bass/Fingered ratio); this is explained and quantified in Comm. 464. It is incorrect to employ the terms EARLY and LATE to distinguish between the two, since some late instruments had relatively short basses (Vienna:'Bassiano liutaro in Roma 1666'; Dalla Casa's instrument c.1765). Similarly, allthough the terms SOLO and CONTINUO may possibly reflect the actual usage of the two types, I would be very reluctant to employ this particular distinction since either type could have been used in both roles. One possible designation might be SHORT and LONG (not to be confused with LITTLE and LARGE!), but this is open to misinterpretation and does not relate directly to the relative length of the basses.

Fortunately, there is one distinctive feature which appears to be directly linked to the relative length of the basses: all archlutes with a small Bass/Fingered ratio have octave doubling of the basses. This clearly reflects the difficulty of obtaining a satisfactory tone with short gut basses. Accordingly, I would recommend (as Comm. 464) the terms SINGLE and DOUBLE to distinguish between the two types of archlute. Such a classification also has the distinct advantage of being immediately evident to even the most casual observer. The fingered string length of archlutes lies in the range 54 - 69cm; the Bass/Fingered ratio of Double Archlutes is within 1.4 - 1.5 and of Single Archlutes 2.0 - 2.4.

With regard to Comm. 464, I would like to make one amendation in the section on Double Archlutes: it is now clear that such instruments survived in Italy well into the 18th century and I would not now restrict the analysis to those made between 1600 and 1670, but extend it to cover all Double Archlutes made after 1600. Even so it is remarkable that the main conclusion may well be largely unaffected: the striking degree of uniformity in the Bass/Fingered ratio of Double Archlutes (Comm. 464 gives 1.44±0.03). Measurements of the drawing in the Dalla Casa MS. (Biblioteca Martini, Bologna EE.155.I.II) gives a ratio of 1.47 and of the instrument in his portrait (Bologna, Civico Museo) a ratio of 1.44.

The classification of Theorbos

Like Segerman, I am uneasy about the designations SOLO and CONTINUO to describe the two main sizes of Theorbo, especially since the larger instruments can be used for much of the solo repertoire and the smaller ones may be used in consort with just the first course tuned down an octave.

In fact, the essential difference between the two main classes of Theorbos is one of size: SMALL Theorbos have a fingered string length of 70 - 80cm; LARGE Theorbos of 81 - 100cm. The Bass/Fingered ratio of Theorbos is in the range 1.5 - 2.0.

Theorbos usually had single basses, but occasionally doubled basses are evident (Talbot MS., Puget painting); such instruments should be called DOUBLE Theorbos, qualified by SMALL and LARGE as appropriate. Instrument with stepped basses may be further qualified by the term ENGLISH; in this case the Bass/Fingered ratio is calculated by taking the longest bass course.

A couple of examples may serve to illustrate how the classification is applied:

- A 14 course instrument with 8 stepped and doubled basses, string lengths 88.5/105.5, 110.7, 118.4, 127.0, 135.9 (Bass/Fingered ratio 1.54) should be called a LARGE ENGLISH DOUBLE THEORBO.
- A 14 course instrument with 8 single basses, string lengths 75.9/129.2cm (Bass/Fingered ratio 1.70) should be called a SMALL THEORBO (or to be pedantic a SMALL SINGLE THEORBO).

With particular regard to the second example, I know of no satisfactory way, other than the pitch, to distinguish between a small theorbo with just the first course an octave down and a small theorbo at a higher nominal pitch with the first two courses an octave down.

German theorboed lutes

The above classification does not include German 'Baroque' lutes with an extended peghead. These instruments were introduced in Germany during the early 18th century and have a fingered string length in the range 68 - 76cm and a Bass/Fingered ratio generally in the range 1.3 - 1.4.

However, if in doubt they may also be differentiated from archlutes and theorbos by their distinctive stringing: 13 course, all doubled except the two highest, with 8 of the courses fingered. I suggest these instruments should be called GERMAN THEORBOED LUTES rather than 13-course theorboed baroque lutes, which could describe an archlute.

Horses for courses

In this Comm. I've used the word 'courses' as the plural of 'course' to avoid any possible misunderstanding. However, upon reflection it seems to me that such usage is redundant and possibly ungrammatical; certainly, I must admit to an uneasy feeling whenever it occurs.

Can we agree that the plural of 'course' in this context is 'course'? One would then refer to 'a lute with 13 course'. After all, masons speak of 'a wall with 12 course of bricks'etc., and I seem to recall an early source with this usage.

Violas, vihuelas and iconography: some comments, etc. on previous communications.

In comms. 629,631,660 and 661, Ephraim Segerman and Donald Gill disagree about some aspects of viola da mano and vihuela construction. As no violas da mano or a standard vihuela seem to exist, much of our knowledge has to come from iconography. Representations can vary from casual to misleading, so it seems worthwhile to say something about iconography and its value or otherwise as an accurate record, both generally, and particularly to the viola and vihuela.

It is useful to ask for what reason the representation was made. An objective study for its own sake is exceptional before the first half of the seventeenth century, and then mainly in Northern Europe. Examples are the many Dutch still-life and genre paintings and the occasional painters like Evaristo Baschensis of Bergamo who specialised in musical still-lifes.

The accuracy (and the information which can be extracted) varies at different stages of a projected work.

A. First sketches of an idea. These will be from imagination and accuracy will depend on the artist's knowledge and memory - it would be unreliable to count strings, etc. An example is the design for a triumphal arch for Anne Boleyn's coronation by (?) Holbein (1) Here detail is very subordinate to the overall idea, although some information can be gleaned about playing positions of the period, viola da braccio in particular, or the relative sizes of tabor and pipe.

B. Detailed preparatory studies of a part of a composition. These will usually be from life and inaccuracies will be by omission - a peg-box will be the correct general size and shape, although not all the pegs will necessarily be shown. One example is Raphael's drawing of a rebec player in the Ashmolean (probably a study for the Vatican Stanze) (2) Similar reliability can be given to unfortunately rare sketch books, eg. the elder Holbein's studies of a similar rebec (Basle Museum) (3)

C. The completed work. This will probably appear more detailed than B., but being at one further remove from the objects depicted can be correspondingly less objective. This will depend upon the individual artist, the period at which he was working, and the importance of the relevant detail to the work. For example, Gaudenzio Ferrari's fresco in the Santuario at Saronno. Here the importance of the violin representations is tempered by other, probably imaginary, instruments. (4)

D. Copies, both in the same medium and as woodcuts or engravings. Obviously a further remove, seen in Raimondi's engraving of Francesco Francia's lost painting of the poet Achillini accompanying himself on a viola da mano (5) Here the approximate size of one viola da mano can be deduced, as well as the round back (from the shape of the case upon which the poet's foot rests) but little about the number of strings or pegs. Even here, in this apparently fairly accurate work, one suspicious feature is the way in which the player's right arm seems to go <u>through</u> the instrument. Together with the ten fret neck, this suggests that the original has been incorrectly reproduced. If the instrument's body length is shortened, to about the bridge position or even further, a much more likely-looking posture is obtained and the frets begin to make sense.*

E. Decorative and naive works, eg. intarsias, mantelpieces, woodcuts, etc. These can range from crude symbols such as the violas da mano in Gafurio's Practica Musicae (6) through Milan's Orpheus with a vihuela (7), to the sophistication of the title page of Praetorius' 'Polyhymnia Panegyrica' (8). All can be misleading, some can be useful. Their

accuracy depends upon the craftsman or men involved and their familiarity with the objects depicted. Some illustrations to didactic material can be very accurate and convey much information even if the execution is rough and the representation diagrammatic, eg. Bermudo's vihuela fingerboard diagrams (9)

Bearing the above in mind, what can we say about vihuelas and violas da mano ?

We have (as far as I know) only one study taken from an actual instrument (10) This study by Campi apparently shows a viola da mano being played by King David. It has incidentally an animal-head peg -box. As a study, it ought to be reasonably accurate and undoubtedly some contemporary instruments looked like this. However, if you are a believer in the ten fret neck as most artists seem to have been (11) the neck is too short. Is it a viola da mano ? Or was the model perhaps ignorant of the correct way to play a viola da braccio ? Many 18th c. guitarists with fine instruments, when postrayed, seem remarkably inept. Or did Campi, like Arnault di Zwelle just run out of space ?

There are several paintings of violas, and a number of woodcuts of vihuelas, some of which although naive in execution, are used to illustrate didactic material and can therefore be presumed to contain accuracies.

Because of the political connections between Spain and Italy during the 16th c. it seems sensible to expect some similarities between instruments bearing the same name.

A preponderance of paintings of violas show ten frets. Taken with Panhormitano's instructions to place the body/neck joint midway along the string length, this seems a reasonable number. Bermudo's diagrams of the vihuela fingerboard (12) clearly show ten frets with the positions of the diatonic notes, and Bb, marked - if these had been merely theoretical, surely he would have given twelve, not ten, positions ? Both he and Mudarra also state that a vihuela is complete with ten frets. (13)

Most pictures of violas seem to show eleven pegs, and strings where discernible; however a few do suggest the possibility of twelve. The Heiber lute with fourteen pegs and thirteen holes in the bridge suggests a certain amount of choice around this period. Similarly Antonio Corona Alcalde quotes evidence for the use of eleven, as against the usual twelve, strings on the vihuela.

I would suggest that the 'standard' vihuela and viola da mano (and the Spanish four course guitar) usually had ten frets on the neck. Also that the vihuela was usually double strung (like an Arab lute ?) and that the viola da mano usually had a single top course (like an Italian lute ?)

I cannot agree with Ephraim Segerman's speculation that vihuelas and violas were converted to guitars by being deepened. The Spanish heel construction seen in eg. the 'G.C.' guitar, Paris Conservatoire E. 30, and the R.C.M. Diaz derives from the vihuela, as shown in the Jacquemart-Andre instrument, and this method of construction would preclude conversion in this way. The other method of guitar construction with separate neck and heel, eg. Tessler, Musée Instrumental de Nice, clearly derives from lutes - the integral neck and heel is an improvement. The tripartite division of the sides of the guitar which he mentions is typically French and post 1640. The earlier Italian guitars where influence could be expected to be strongest are multi-ribbed like contemporary lutes (compare the lutes and guitars by Sellas, etc.) or take advantage of the flat sides for wide illustrative panels.

On stings, or points below the fingerboard extending onto the belly. Their use would seem to be a neat way of finishing off the line of inlay necessary to strengthen edges of a neck where frets are tied beyond the fingerboard. They occur in several paintings of guitars.

On wood-blocks and reversal.

A wood-block is made by removing the white areas - the spaces around and between the lines that are to be printed black. When it is inked and printed, the drawing will be reversed. In many artistic circumstances this will not matter and may even be an improvement. Because of this there was always a tradition amongst printers that reversal was unimportant, and many copper-plate engravings of well-known paintings appear reversed right up to the 19th century.

To correct this on the occasions when it is necessary, two options are available. The original drawing, when glued to the face of the block for cutting, may be drawn reversed; or it may be glued face down, either after having been traced through the paper, or the back of the paper may be thinned until the drawing can be seen. Obviously the latter implies more trouble and work for the block -cutter, whilst the former requires extra care from the draughtsman and from his author.

An interesting series of examples is shown in Louis Grijp's article on cittern fret patterns in the Galpin Society Journal XXXIV. Here the Phalese 1570 and 1582 blocks are copied from Le Roy 1565, probably by pasting a print from a copy of his book directly onto the new block. However Mersenne seems to have had Le Roy's original blocks available (he also used Phalese' guitar) and altered the fretting by inserting a new section into the block. This can be seen more clearly in Chapman's translation.

The example from Kircher 1650 where the shape of the fingerboard is reversed, but not the fretting, is the result of incompetent draughtsmanship. A more mysterious example, where an otherwise high standard is achieved, is in Mersenne, where the plate of lute and liuto attiorbato (?) has the lute alone reversed. What seems to be definitely a block-cutters error is seen in Praetorius where the klein Englisch zitterlein is completely reversed.

These examples show that it is dangerous to generalise, for example on cittern cut-away necks or the lack of them, from only one or two illustrations. We cannot know on iconographic evidence whether it was the second or the third course that was triple on Robinson's cittern.

A feature unique to marquetry and intarsia is that it is possible to use the materials from which instruments were made for the representation. This occurs on the Eglantine table. A series of intarsia which contain musical instruments and have not so far as I know been published, are in Pisa cathedral. Permission would be required to gain proper access, but perhaps one of our Italian members could help ?

1. Ill. Neville Williams. Henry VIII and his court.
2. Ill. E.H.Gombrich. Norm and Form.
3. Ill. E.Schilling. Drawings of the Holbein Family.
4. Ill. E.Winternitz. Musical Instruments and their Symbolism.
5. Ill. J.Tyler. The Early Guitar.
* Further confirmation comes from the case, which seems to be too small for the instrument.
6. Ill. H.Turnbull. The Guitar.
7. Ill. as above.
8. Ill. Pictorial and Decorative TitlePages. Dover.
9. Ill. A.Corona Alcalde. The Lute, vol XXIV part 2.
10. Ill. F.W. Grunfeld. The Art and Times of the Guitar.
11. Ill. Turnbull, plate 8, detail by Signorelli.
12. Antonio Corona Alcalde. The Viola da Mano and the Vihuela,
13. The Lute, vol XXIV part 1, - easily the most detailed and scholarly work on the subject to date.

FoMRHI Comm. Peter S. Forrester

Citterns and Chitarras battente : re. Comm 698, Grove Review

Cittern. The built-up cittern often has the main back* and sound-beard bars opposite, at approximately the point of greatest width, frequently with connecting spacers/rib-strengtheners. There are usually (always-?) 3 sound-board bars - greatest width, above, and below the rose. That below the rose usually tapers to nothing before reaching the sides. Its function is to hold this area of sound-board down against the see-saw effect of bridge pressure around the fulcrum of the main bar.

The cut-away neck had been translated from cittern to the Palmer orpharion by 1619, so presumably had been around earlier on English citterns. The only (unaltered) non-Italian 4-course cittern known to me (in Brussels) also has a cut-away. Its presence or not, in paintings and wood-blocks can vary with reversal, part-corrected blocks, blocks copied from paintings, and vice-versa.

There does seem to be some connection between the long-necked lute and the cittern. Apart from the use of metal strings, the interval of a second between first and second courses seems to be echoed in present day saz tuning, g,d,a, which uses bourdons and octaves on the outer courses, and where at least one technique uses the d course for the melody with a kind of alternating drone on the others. According to Marcuse, the tanbur has a tuning a,c,d,d, and other instruments from neighbouring parts of the USSR also use an interval of a second. At least two 16th c. citterns (in Vienna) have the T-shaped pegs typical of long lutes.

Fret blocks on the 15th c. instrument do decrease from nut to body on the playing card representations illustrated in Grunfeld (The Art and Times of the Guitar). More importantly, also on the della Robbia relief in Florence (a cast is in the V.& A.) where all the instruments seem to be particularly accurately depicted. (But perhaps the Grove article has caused a misunderstanding by the reviewer, height (depiction) should be read as width (instrument). Possibly their use has something to do with the later development of the cut-away neck and fret-wedges.

I cannot agree that Paolo Virchi's 'perfecting' the cittern lay in making it fully chromatic. (Or in inventing the built-up one). The Le Roy and Ballard cittern, as Ephraim Segerman says, was built -up by 1565. That on the Eglantine Table in Hardwick Hall was built -up and chromatic in 1568. I suspect that the 'perfection' may have been the addition of basses, making it more suitable for solo music - exemplified in his book. Holborne's apologia mentions 'a tolerable allowance in the nature of the instrument'. Incidentally Stephen Gottlieb notes a 'Hieronymus Brixiensis' stamp on the so-called Virchi cittern. As this stamp (Hieronymus of Brescia) also appears on a cittern in Paris, what evidence is there that Girolamo Virchi rather than Hieronymus, was the maker ?

* Some built-up citterns had no bars on the back.

Chitarra battente. The chitarra battente seems to have been invented during the 17th c.. Several, including that owned by Harvey Hope (ill. Baines, European and American Musical Instruments) have typical 17th c. decoration, together with the thin back and sides of other Italian guitars, and no scratch-plates. The two, probably 18th c., instruments in Brussels do have scratch-plates. I suggest that it was merely a wire brass) strung version of the usual chitarra,

developed for playing alfabeto, probably originally with the fingers, later with plectrum. The metal strings and string fixing are copied from the cittern. The bend in the sound-board could also come from cittern construction (no bend, but built-in tension at this point) or from the viol back. It was originally made by converting ordinary guitars, shortening the neck to allow a similar pitch using metal strings. The short neck was later copied on scratch-built instruments although conversions probably continued to be made contemporaneously. Two characteristics not mentioned are the depth of the sides, which is deeper than the usual Italian guitar - a useful clue to converted instruments - and a partiality for walnut.

Harvey Hope mentions holes in the side to 'give vent to the sound' according to modern players. These may rather indicate a particular method of construction. Filled in, they also exist on the Ashmolean Stradivari guitar, and on a six-string circa 1790 guitar in my own possession.

FoMHI Comm 741 **Donald Gill**

.....Chitarra battente, further comments.

It is a pity that Harvey Hope, in Comm 709, did not also point out that the Tucci and Ricci article reveals that the folk chitarra battente has equal sized strings throughout and is tuned in the baroque re-entrant way, the lowest course being in the middle. It seems to me to be highly probable that it has always been tuned that way, bearing in mind the persistance of similar tunings in S.American folk guitars, and, I believe, certain Portugese guitars.

Alternatively, I have speculated that if brundons were used on the fourth and fifth courses on historical instruments, overspun gut or silk may have been used, as on the 'Neapolitan' mandolin in it's early days. The chitarra battente's distinguishing features, deep body (except perhaps in conversions of ordinary gut-strung guitars), bend in the soundboard just below the bridge, and bottom end fixing of the strings are all shared with the 'Neapolitan' mandolin, and it needs to be determined if possible whether there is any good evidence that the chitarra battente is anything other than a mid-18th century variant of the guitar.

Other parallels with the mandola/mandolino/mandolin are conceivable. Wire strings were sometimes used on that group of instruments(and quite possibly four string examples were tuned like violins in the 18th century). Were wire strings sometimes used on ordinary baroque guitars? It is easy to account for the structural changes that we recognise as the characteristics of the 'Neapolitan' mandolin and the chitarra battente, against such a background. I imagine that a lightly wire strung re-entrant tuned baroque guitar would sound rather lovely and will have to try the experiment one day. Meanwhile perhaps Harvey Hope can give us his opinion about the dating of chittarra battente?

FoMRHI Comm 742 E Segerman

Response to Comms 739 and 740

Peter Forrester has sanctioned my reply in the same O, and he sent his Comms well ahead of time so my reply is not holding up the editing.

Built-up cittern design

I applaud Peter Forrester's comments on the built-up cittern. He has examined many more originals than I have. Concerning the opposite placing of the main back and soundboard bars, I must have confused what I've seen on the original instruments with my barring experiments in reconstructing the small English cittern. In those experiments, having the bars opposite tended to stifle the low-frequency resonance. I apologise to readers for my error.

Cut-away neck and reversal on wood blocks

With Italian musicians well-represented in the Elizabethan musical establishment, English instrument makers would have known Italian citterns, but this in no way implies that a cut-away neck was ever on an English-made cittern. My scenario about the Palmer orpharion is that it was made for a Danish musician who had just come from Italy where he had probably learned to play the cittern and wanted a similar feel. I understand that standard procedure for the training of Royal Danish musicians at that time was to be sent to Italy to learn the principles of musical composition and improvisation and then have a spell in England (to learn the good tunes) before going home. This instrument has been in Denmark for a long time.

No cut-out is indicated in the drawings of the bandora and penorcon of Praetorius, the orpharion and bandora of Barley, the cittern and bandora of Fludd and the cittern of Robinson – in short every illustration of an English wire strung instrument of the time, where the view would show the difference. The same is true for France in the drawings of the cittern in Le Roy and Ballard (and the copies by Phalese and Bellere as well as Mersenne) and the cittern neck in Vreedman (published by Phalese in 1568). Would Peter have reversal error in the majority of these so the cut-out was then usual?

It is always very welcome to be told how errors could have crept into the iconographic evidence. But, as Peter has pointed out, poor quality information is not the same thing as no information. Lots of consistent poor information is good information.

Peter seems to be much more impressed by surviving instruments than by iconographical evidence. With most owners and custodians of original instruments, he seems to have the fantastically optimistic confidence that if no evidence of alteration is apparent, the condition is original. This is an insult to the skills of master craftsmen throughout the ages who regularly modernised valued old instruments, making them look like they had always been that way. The high quality fiddle establishments of today are not a new phenomenon.

Peter's support for a cut-out on English and French instruments is based on one possibly French instrument (Peter is rightfully careful about calling it "non-Italian"). I think that the balance of evidence is clear.

Connection between the tanbur (long-necked 'lute') and cittern

This connection postulated by Winternitz is relevant between the sixth and twelfth centuries, before metal strings were used on either instrument. 'T'-shaped pegs may be typical for tanburs, but they were also common on most types of European medieval fingerboard instruments, citoles no more than others. The history of the tuning peg has yet to be researched properly (I know of no evidence of its use earlier than around the first century AD in India, and I'm not sure of that one), but common ancestry seems more likely at the moment than direct 11 - 12th century tanbur-citole influence.

As for a tone difference between the two highest courses, this is just one of many tunings found on tanburs played today and we don't know how far back this particular one goes. We also don't know how far back it goes on the cittern. If the Berkeley ms instrument is a citole, the tone difference is between the two lowest courses. The 15th century cetula has this for both the two highest and two lowest courses (as has the French cittern tuning). Perhaps the tone between the two lowest courses is a more characteristic aspect of the ancestry of the cittern.

The best argument for a relationship between the tanbur and citole is that some citole illustrations show frets going all the way up the fingerboard that often extends some way over the body. This could possibly imply a high position playing style (unusual on fiddles according to Jerome) carried over from a longer-necked or smaller bodied instrument. Since tanburs apparently were not adopted in Medieval Christian Western Europe, the probable place for such influence would be Spain. But where do we see Spanish Arab tanburs? Maybe the Western Arabs used short-necked (or large bodied) tanburs that we would call citoles. This whole line of approach is worth pursuing further. But the little decorative lyre wings that were Winternitz's concern were extremely rare on tanburs, and they are not on the Spanish citoles (in the Cantigas) that I know about.

Fret blocks

There is no argument concerning the widths of the fret blocks often decreasing from nut to bridge. The DoMI entry clearly refers to fret height: "Wooden frets, formed like a miniature staircase with height decreasing towards the bridge ... (see Fig. 4)". Application of a straightedge to Fig. 4 (the Gubbio intarsia) shows this not to be true. Tyler is not the only respected organologist who has been caught by this optical illusion. The drawing copying this figure in "European and American Musical Instruments" by Tony Baines (p. 40) shows the staircase.

Chitarra battente

I cannot see how Peter can tell the difference between a late 18th century skillful conversion of a 17th century guitar to a chitarra battente and an original 17th century chitarra battente. This illustrates an historical problem that we need iconographic or literary evidence to resolve.

Raimondi engraving

I don't see the player's right arm going through the instrument. Maybe that is because I expect the instrument to be very thin. The case confirms this (the fairly flat boards for the front and back would have to be fairly thick to give adequate protection). It is true that the body length of the case is only about 2-3% longer than that of the instrument, when it should be about 5%. The amount of shortening that Peter postulates is unwarranted.

Campi drawing

I would think that a bass viola da braccio would sound fine if it were fretted and plucked like a viola da mano. By 1570 (or for that matter, at any time) a waist cut-out with sharp corners and a moveable bridge (we can see the strings on the other side) would have been most unlikely on an instrument intended primarily for plucking.

Number of frets on the viola

What is this "preponderance of paintings of violas" that show 10 frets? I am glad that Peter is careful only to include the Spanish 4-course guitar in his list of 10-fret instruments. I would expect a closer relationship between the guitar and the vihuela or viola in each country than between the vihuela and viola in different countries. If the vihuela and viola usually differed in pegbox design and number of strings in the first course, why rigidly insist on both usually having 10 frets on the neck. I only claim that

the viola was more flexible in this matter.

Conversion of vihuela to guitar

I can't see how the Spanish heel design precludes a conversion from vihuela to a 5-course guitar. One needs to remove the back and belly and it makes no difference if the inside heel is destroyed. An angled cut (meeting the top of the neck at the body-neck join) removes the neck. New blocks and an outside heel need to be made, and if the original sides are going to be reused (it might be easier to make new sides) they are removed from the original blocks and, with more wood to give added height, attached to the new blocks. I accept that the tripartite division could be a later French development.

Lute stings

I'm sorry Peter doesn't like my speculation about the stings. I like it better than his because it explains why the decorative feature invades the soundboard, while his would do just as well aesthetically (if not better) by ending with a continuation of the curve of the soundboard edge. Also, rebuilding lutes with wider necks was common while I know of no evidence of tying frets on lutes past the fingerboard.

FoMRHI Comm 743 E Segerman

More on Early Gut String Diameters

I recently stumbled on another reference to the number of guts in a string in Mersenne (1636). In Proposition XIV of the 4th Book he dreams about enormously large instruments which could use strings "made of 144 guts, the diameter of which is almost 3 lines." A line is 2.28 mm, and I estimate "almost" to be "10% less than", so the diameter was about 6.2 mm, leading to a cross-sectional area per gut of about .21 mm^2. This result is essentially the same as that from Maugin & Maigne (1865) calculated in Comm 325, so contrary to Comm 343, the guts of 19th century French sheep were the same as 17th century French sheep. Since Maugin & Maigne's information is more accurate, we shall now use .50 times the square root of the number of guts as the estimate of the diameter in mm (as derived in Comm 325). This figure is to be multiplied by 1.09 for a high-twist string, 1.3 for a 3-strand catline and 1.5 for a 2-strand catline. For catlines these are the solid-gut equivalent diameters: the measured outside diameter would be about 10% greater. For plain gut and high-twist strings, polishing takes off about 10% of the diameter. Since this is a relatively constant factor, it cancels out of the calculations. This is because we use strings that are already polished in setting up our mathematical relationship. We don't know about the polishing details for early catlines, so ignoring the difference means that the diameter estimates are here a bit rougher.

Mersenne's bass viol 6th, archlute 10th and trumpet marine string

Mersenne's greatest racquet string had 12 guts, so we calculate that it was 1.7 mm thick. This is then the diameter of his trumpet marine string (4th Book, prop. XII). Mersenne estimated that the bass viol 6th and archlute 10th string were "made of 48 or even 50 or 60 guts, for they are at least 4 or 5 times as bulky as the greatest of the racquets." By "bulky" he must have meant cross-sectional area, and his actual observation would then have been that the thick string's diameter was 2 or a bit more times the diameter of the thickest racquet string. This leads to a diameter of about 3.6 mm. The string was probably a catline so the equivalent diameter would be about 3.3 mm. Using the bass viol string stop of 87 cm and pitch of 60 Hz derived in Comm 325, we get a string tension of 12 to 13 kg. This is high. Perhaps French bass viols of Mersenne's time didn't survive because they were not made very resonantly, requiring particularly high string tension to get the requisite sound volume.

With such heavy strings on the basses of Mersenne's archlute, one can appreciate why there were only 4 bass courses. To avoid pulling off the bridge, shorter basses than on

Italian archlutes seem to be called for. The relative sizes in Mersenne's drawing may then be correct, with the lute's string stop being intermediate between the fingered strings and the basses of the archlute. Perhaps this instrument is related to the Arcileuto Francese used almost a century and a half later for the F. Dalla Casa ms (c.1765). ? ?

Prin's trumpet marine string and the basse de violon

Prin (1742) wrote that the main string of the trumpet marine had 60 guts and was a little thicker than a bass 3rd and somewhat finer than a 4th. The diameter would be 3.9 mm if it had low twist or 4.2 mm if it was a high-twist string, which is more probable. A typical string stop for a trumpet marine of the type Prin developed (with many gauge 4 (0.380 mm) brass sympathetic strings all tuned to the same note as the main string) is 145 cm. The nominal pitch was C, probably at something like an a' = 410 Hz semitone-low standard, so the frequency was about 61 Hz. The 4.2 mm string would then have 60 Kg tension. That is a lot. Perhaps the pitch was an octave lower, in which case the tension would be 7.7 Kg, which seems very little for such a thick string. We need to experiment with one of these instruments to see what works. Bowing only harmonics could have unusual tension requirements.

In "L'Encyclopedie" of the 1750's, the "basse" is the basse de violon tuned in 5ths upwards from BB^{b}. A string intermediate in pitch between the basse 3rd and 4th would be nominally a C♯. We presume that the trumpet marine string tuned to this pitch would have the same tension as the other basse strings. At a string stop of 74 cm and frequency of 64 Hz (at a' = 410 Hz), a 4.2 mm string would have a tension of 17 Kg. This would be the tension of each string of the basse. This tension is just what we would expect from the principle of tension being proportional to length for acoustic balance. That is because a violin string (at 32 cm string stop) would balance with the 17 Kg basse string if it had about 7.4 Kg tension. This is the same as the 1770's tension deduced in Comm 713.

What is surprising about this result is that the basse seems to have used uncovered strings for its 3rd and 4th. With the French using metal windings on their violin 3rds and 4ths and on their viol strings from the 4th downwards, one might have expected covered lowest strings on their basse. Perhaps the French then liked the thick gut sound at the bottom of their orchestras, but not elsewhere (like was the case everywhere in the 19th and early in the 20th century). Of course it is possible that opinion was divided on this and both covered and uncovered strings for the basse were available. Then Prin just compared like with like, and this may say nothing about a majority preference on basse stringing.

Angelucci (c.1765)

In Comm 528, Angelo Zaniol reproduced Valdrighi's 1884 transcription of the description of string making by Angelo Angelucci published in the Gazzetta Musicale di Milano. This description was also published by Jerome de La Lande in Voyage en Italie (1769) which was reproduced in the Journal de musique par une societe d'amateurs (Paris, 1777; facsimile ed Geneva, 1972). Eisfeld (Berlin, 1780) translated the de la Lande text into German, and Micat (Musique Ancienne 18, 1984) translated Eisfeld's text back into French. All versions are essentially identical, so either the Gazzetta article is a translation of de La Lande publication or vice versa. Of relevance here, the number of guts in strings were: 2 for a mandolin first, 3 for a violin first, 7 for the thickest violin string and 120 for the thickest string of the contrabasso.

We should expect the violin string information to correspond with Ricatti's (1767) as reported by Barbieri (GSJ, XXXVIII (1985), p 26). Barbieri calculated that the diameter of the violin first (of which Ricatti measured the weight per unit length) was .69 mm. Similarly the diameter of the thickest string (the third) was 1.09 mm. If these two strings had the same amount of twist, the ratio of diameters (1.58) should equal the square root of the ratio of the number of guts in each. From Angelucci's information,

$\sqrt{7/3}$ = 1.53. But Angelucci mentioned a standard number of turns on a wheel for twisting the strings, with no apparent variation with string diameter. This would give thicker strings more twist than thinner strings. If Angelucci's violin 3rd was fully high twist, the ratio of diameters would be 1.66. But we wouldn't expect maximum twist because he presumably used the same number of turns on thicker strings. (With the thinner basses of the unequal-tension stringing that came into fashion in the middle of the century together with a covered 4th, a catline or high twist 3rd lost its necessity.) This situation continued through the 19th and first half of the 20th century. So the Angelucci and Ricatti sets of information fit together fairly well.

Ricatti's first string will then give an estimate of the cross-sectional area per gut. With 3 guts giving a diameter of .69 mm the cross-section area per gut is .125 mm^2, leading to the diameter in mm equalling .40 times the square root of the number of guts (this would need to be multiplied by a factor which takes the twist into account). A French gut had a cross-sectional area of .195 mm^2, which is more than 50% greater bulk than an Italian gut. Angelucci said that 7 or 8 month old lambs were used. The French like their mutton.

Consequently, the mandolin first had a diameter of .57 mm, and the thickest contrabass string would have a diameter or equivalent diameter of 4.4 mm times a twist factor. If it were high twist, it would be 4.8 mm thick. If it was a catline it would have an equivalent diameter of 5.8 or 6.6 mm, with an outside diameter 10% greater. The Encyclopedie lists the tuning of the Italian contrabass as GG D A. An all-gut GG string was used on the 3-string double bass well into the 20th century. We can expect the string stop to have been about 105 cm. At the pitch standards of Venice (a' = c.456), Lombardy (a' = c.430) and Rome (also used elsewhere under the name "corista") (a' = c.383), the frequency for GG is 51, 48 and 43 respectively. A low-twist string is rejected on the basis of poor tone. A high-twist string of diameter 4.8 mm would have tensions of 29, 25 and 20 Kg at the three standards respectively. A 3-strand catline of equivalent diameter 5.8 mm would have tensions of 42, 37 and 30 Kg respectively, and a 2-strand catline of equivalent diameter of 6.6 mm would have tensions of 54, 48 and 38 Kg respectively. The catline tensions all seem quite excessive (modern high-tension all-metal double bass strings have about 30 Kg tension), and I consider high-twist strings most probable, with the contrabasso GG being 4.8 mm thick.

Gut strings with rope construction seem to have gone out of fashion during the 18th century. I've always wondered why. More work goes into them so they would have to be more expensive. Where a highly focussed sound was required, covered strings were available. When the less-focussed thick-gut sound was preferred, it seems that they could get away with the cheaper high-twist type of string.

Appendix

There was an error in Comm 325. I inadvertently transcribed 8.0 instead of the original 7.5 Kg for the tension of the violin d' as published by Maugin & Maigne. The corrected diameter is then 1.336 mm, the cross-sectional area 1.402 mm^2, and the cross-sectional area per gut .200 - .234 mm^2. The average, .217, is 12% higher than the a' string average, and can represent about half the 20% increase expected if it was a high-twist string. This is similar to the degree of twist found above in Ricatti's d string.

FoMRHI Comm 744

Moiré Contours

John McLENNAN

A useful application of Moire patterns for the maker is the direct production of contour lines of equal elevation of a solid object. Thus the perfection of the 3-dimensional shape of an arched violin plate can be assessed easily and recorded photographically if desired. The contour lines arise from the interaction of a grid and it's shadow cast onto the arched surface. C.H. Agren describes this application in C.A.S Newsletter No.14 Nov. 1970.

The grid consists of parallel opaque lines having a small uniform spacing. The violn plate is placed on a flat horizontal surface and the grid is placed as close as possible over the plate without touching and supporting on the same horizontal surface. The shadow of the grid is cast onto the violin plate by a strip of light(such as a flourescent tube) parallel to the grid lines at an angle of about 45 degrees. The Moire pattern is viewed from vertically above. The difference in height between the 'contour lines' is equal to product of the grid spacing and the tangent of the angle of elevation of the light. With a strip light at 45 degrees a grid with a spacing of 1 mm will produce contours seperate by 1 mm in height. Bringing the light more to the vertical will increase this separation. For highly arched plates with a pronounced scoop at the middle bouts, one side may be in a shadow if the light has a low elevation.

The contrast of the Moire pattern is improved if the strip light approximates a line source. A quartz halogen source used in photocopying approaches this ideal and can be backed by a cylindrical reflector. Further improvement occurs if the grid is blackened and the plate is in the white. A varnished surface can be covered with strips of white teflon (plumbers) tape to give a non-reflecting matte surface.

Moire patterns can be photographed with an f-stop giving the required depth of field. The grid lines can be eliminated from the photograph and the clarity of the contours improved by movement of the grid normal to the lines during exposure. The contours remain stationary.

Construction of a Grid

This description uses aluminium sections which can be bought off the rack, can be easily cut and require a minimum of dressing. The result is rigid light and compact.

The frame was made of 11/4 x 1 x 1/8 inch (31 x 25 x 3 mm) channel. The channel at each end of the frame was a recptacle for the anchoring and tensioning of the nylon grid line. The side rails, of the same channel, were set facing out and were fastened to the end channels with brackets pop-riveted and bolted, the nylon 0.010 inch dia. was spaced using a threaded rod of the desired pitch. It was returned round a 1/2 inch (12.5 mm) dia. aluminium round. The threaded spacer rod was supported on a 3/4 x 3/8 inch (19 x 8 mm) rectangular

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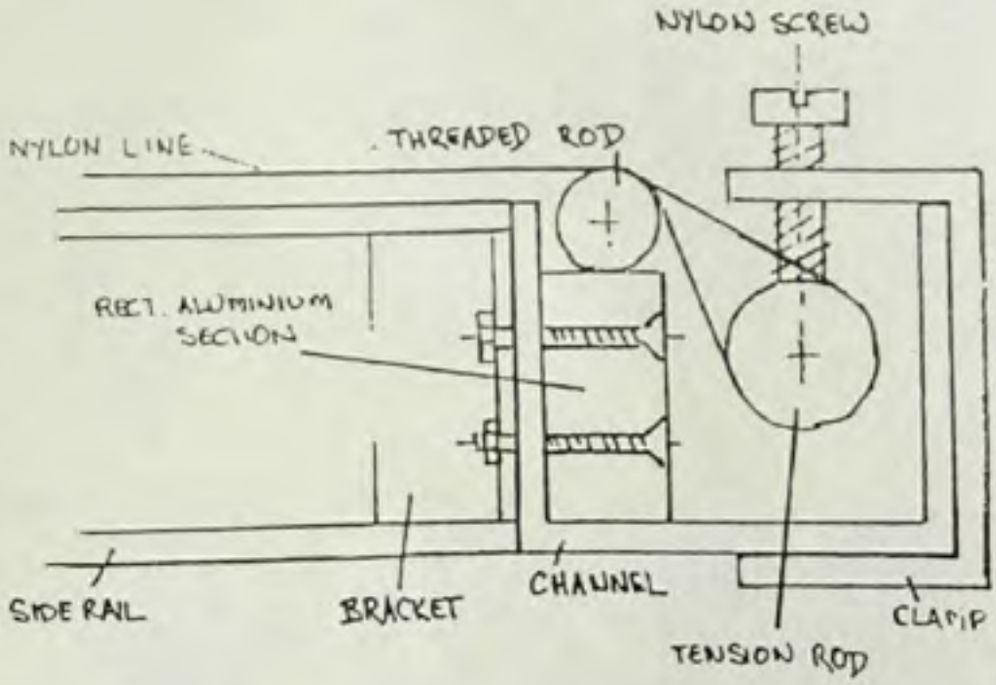
aluminium section which allowed the nylon line to clear the frame.

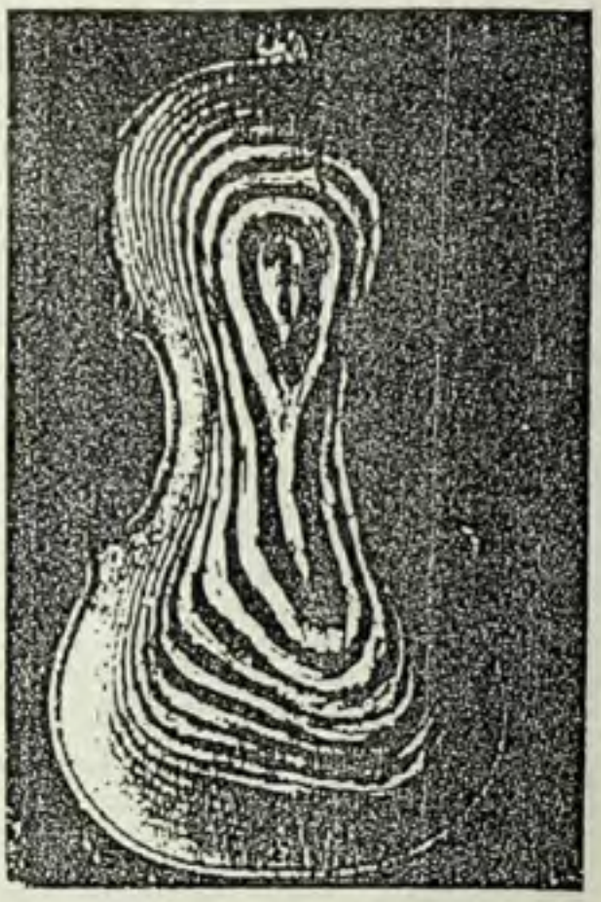
Tension was applied to the nylon by clamps at each end of the aluminium round. A 1 inch length of the same channel was used for the clamps and a 1/4 inch nylon screw fitted. The channel dimensions allowed very neat fit. The nylon thread was sprayed with flat black from a can.

An alternative method to using nylon line is to use a suitable cloth and remove the cross thread. Viole terylene cloth was found satis factory. It was glued between wooden battens and tensioned in the same frame as above. When using this material I added a third clamp at the middle of the channel. After the cloth was glued into the end pieces, the crossweave threads (weft) in the space between the threaded spacer rods were withdrawn from the cloth leaving the longitudinal threads (warp) which were used for the grid. These threads were 1/3 mm apart and could be grouped in two's and three's to achieve a desired spacing. These threads would be sprayed with flat black as before.

The winding of the nylon line and the return round the tension bar has to allow for the final tightening. The round bar used in each channel for this purpose was anchored at one end with a clamp. The other end was free to move to allow the nylon line to be passed back and forth. Some adjustment of the nylon was required to allow the final tensioning to be uniform.

Alternatively, the nylon line could be returned using rows of pins strong enough for the purpose, driven into a batten, staggered if needed.





Screen pattern shows highest spot too far up the plate and a high ridge running down the right of the lower bout.

This pattern shows even symmetrical arching.