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FOMRHI Quarterly

FELLOWSHIP OF MAKERS AND RESTORERS OF HISTORICAL INSTRUMENTS

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FELLOWSHIP of MAKERS and RESTORERS of HISTORICAL INSTRUMENTS

Bulletin no.27 April, 1982

We start, as so often in the past, with an apology. Q 26 was disgracefully late. I won't say that it was due to circumstances beyond our control; perhaps beyond our management or competence would be more accurate. The trouble is that, for the first time in my life, I'm holding down a 9-5 (or somerimes -6) job, and whereas in the past I could please myself about finding time for FoMRHI (all I was doing was teaching in schools, playing concerts and writing books), now if there is a crisis here in the Bate Collection (and I think that a burst pipe under the floor followed by a series of burst pipes in the ceiling could be called a crisis - no, there wasn't any damage to any of the instruments, only to my nerves), then FoMRHIh as to wait. This was then compounded by sickness at NRI (there's been a lot of 'flu around) which delayed putting it together, followed, I think, by more at the printer. So that's why January was very late going out and, as a result, why this will be rather thin; you haven't had much time to send in any comments etc.

The amount of time getting this collection into its new showcases, labelling it, coping with visitors, letters and so on, plus the fact that I'm not the only one who wants to use the Faculty copying machine, is why some of you have not had the photocopies of back numbers that you've asked for. Please be patient. I could be tactless and say that if you hadn't waited seven years to join FoMRHI you wouldn't have to wait for the photocopies, but I wouldn't dream of saying such a thing! I will do them as soon as I can.

FINANCIAL REPORT: This hasn't yet been audited, but Margaret tells me that the subscription income for 1981 was £3,210 (that's after deducting the advance payments for 1982 that came in before the end of the year and after adding the similar payments that came in towards the end of 1980). The expenses for the year were £3,148, leaving a surplus of £62, which is just as it should be - as small as possible a surplus without going into the red. There is an accumulated surplus from previous years of £1,120, and I expect that we shall use most of that this year; printing costs go up all the time, as does the price of paper, and there has just been a massive increase in postage charges. So, I warn you, the subscription will have to go up next year.

Margaret also asks me to beg those of you who pay by Eurocheque to put their Eurocheque number on the back of the cheque; otherwise we are charged £1.50 for each cheque.

She says, too: "I know it's unbelievable, but could you ask people to remember to sign and date their cheques?"

LOST MEMBER: Kjartan Oskarsson, who was in Vienna, has vanished. Can anyone please put us in touch? Per Sabelström has been found (thank you, Cary), but Jane Hutber is still lost. Do please tell me when you move; I told you (but several of you have been writing to Dulwich nevertheless, and I've no way of telling whether the Post Office has been sending everything on - all I can do is hope so). Bear in mind that if, because you haven't told me, I have to send you a duplicate Q or Qs, I'll expect you to pay for them. When the Post Office (ours or yours) loses them, of course we replace them free, but they're lost because you didn't tell us of an address change, it seems unreasonable for your fellow members to pay for the replacements.

FURTHER TO: Comm.368 & Bull.26, p.3: Nicolas Meeùs writes:

John Rawson's criticism against my Comm. 368 is undeserved. I had proposed the position of the plucking point and whether one or both bridges are on free soundboard as important criteria for a nomenclature of the plucked keyboard instruments. He rejects them as 'parts of the instrument that are not visible' or as 'minor differences'. Is the position of the bass strings really so much more important?

He argues that I refer to some 'intermediate or vague version' of the spinet or virginal. It is true that the plucking point and the bridge position allow for intermediate or uncertain cases. But it is for that reason, precisely, that I considered these criteria unfitted for differentiating a spinet from a virginal. If M. Rawson had read my Comm. with a minimum of care, he would have realized that we were in agreement on this point and might have refrained from accusing me of having 'done much to confuse the whole problem of how to differentiate a Spinet from a Virginal'.

M. Rawson considers that there exist only two basic layouts. This is true only insofar as his criterion (the position of the bass strings) is really of paramount importance. But it is an oversimplification because there are many other criteria to consider. He thinks that 'most people' use his terminology. He may check that R. Russell, F. Hubbard and S. Marcuse are not among this majority: they restrict 'virginal' to the rectangular instrument and call 'spinet' all the others (I do not want to imply that their terminology is better than M. Rawson's, but merely that the problem cannot so easily be dealt with).

JM adds: I started this nomenclature business; do you think that perhaps I could call a halt to it? I'm not insisting, if any of you still have strong views that you want to express, but I think that it's gone on long enough and, more important, that we're not going to get any general agreement.

Comm.392: John Paul has sent a further note which is long enough to stand by itself as a short Comm. I wrote to him (he wasn't sure whether it was useful enough to include) that these are just the sort of technical notes, dodges, devices, call them what you will, that we need. I'm sure that most of you could write up similar techniques that you have devised for dealing with all sorts of odd jobs and small parts -- please do so; they all help your mates.

ARCHIVES: Some of you may know that we have Reginald Morley Pegge's working papers, notes, etc, here in the Bate Collection. These have been joined by the R.B.Chatwin papers, which have been deposited here by Eric Halfpenny's widow and son, May and Peter. I've only had a quick look through, and it seems to be mostly on chalumeau, early clarinet and string instruments. Morley's papers are mostly on horns, of course, but there's a fair amount on other brass and wind instruments, and we have all his library, including a very large collection of tutors and methods for all wind instruments, and many books on French organological and musical history. It's all accessible any time that I'm here (see the end of this Bulletin) to anyone who's interested.

NEWS FROM NORWAY: A recent member, Odd Aanstad, who is a keyboard instrument maker, restorer, etc, writes that "only a few instruments earlier than 1800 have survived in Norway, and I presume that about 10% are harpsichords, 20% are clavichords, 5% are old grand pianos and the rest are squares. From 1800 to 1850 I believe 5% grands and 90% square pianos". I hope to be in Norway this summer and will report on what I see in the museums we visit there in the July Q.

NEW SOCIETY: I've had a note from Doreen & Michael Muskett, who used to be FoMRHI members, that they are starting a Hurdy-Gurdy & Musette Society. There will be a meeting to launch the Society on Sunday, May 23rd at 3 pm at their home, Piper's Croft, Chipperfield Road, Bovingdon, Herts, which is near Hemel Hempstead, and if this arrives too late for you to get there on that day, write to them there if you are interested, please with a stamped, addressed envelope. They are linking the hurdy-gurdy with the musette du cour because the two instruments share much of their repertoire. They hope to publish methods and music, supply reliable working drawings, pass on news of books and other publications, and so on and so forth. They already issue quite an interesting newsletter, and this is available from them for £1 for a year's subscription. They also run courses (see below).

EXHIBITION: Peter Spohr writes:

The reason for which I am writing is a flute-exhibition which is organized by the hurdy-gurdy maker from Frankfurt, Kurt Reichmann, and me and will take place about 12 km from Frankfurt in the "Dreieich-Museum, Fahrgasse 52, D-6072 Dreieich/Dreieichenhain, West Germany". It is the third exhibition in a series (1980: hurdy-gurdies and bagpipes, 1981: plucked string-instruments) and will start on May 6th, 1982 for 2-3 months. Instruments from museums and private collections will be on display, about 50 recorders and transverse flutes from about 1600 to today and the same quantity of folk- and ceremonial instruments from all parts of the world. A detailed, illustrated catalogue is in preparation and can be obtained from me.

I think some FoMRHI members might be interested in the exhibition or the catalogue so would you please inform them in the next quaterly? Visitors are always welcome in my house.

OFFERS: Brian Jordan has opened a new shop in Cambridge at 12 Green Street. In conjunction with the opening, he is offering a considerable list of books and music at much reduced prices. The opening was at the end of January, so I don't know how much will be left, but if you want a copy of the list (and if you've not had a copy of his new general list) drop him a line, presumably at 60 Princedale Road, London W11. Remember to say you're a FoMRHI member when ordering, as he doesn't charge fellow members postage. And if you're in Cambridge, look in at Green Street, which runs between Trinity and Sidney streets.

The Crafts Council is revising its register of conservators and restorers and has noticed that they have few musical instrument people listed. They've asked for a copy of our List of Members, which I'll send them as soon as it's done (the old one is out of print), but if you want to be listed you might write to them direct (12 Waterloo Place, London SW1Y 4AU, addressing the letter to Maureen Winnall). They don't make any charge to be on the register, which can be consulted by anyone looking for a conservator or retorer and which they consult themselves when anybody writes to them for advice. They'll send you a long 4-page form to fill in, but if you're looking for that sort of work, it's probably worth the effort.

REQUESTS: Gregory Lewin is planning work for a postgraduate research degree on the history of the dulcian (curtal) and early bassoon. To start with, he is making a survey of surviving instruments up to 1800, and he intends to draw and measure as many of these as he can. He would be very grateful to anyone who can help him locate any instruments, and of course even more so to anyone possessing such instruments who will give him access to them. See also his Comm.herewith.

He says, too, that although he is a relative newcomer to instrument making (his full-time work is running a school music department) he would be very happy to give any help or advice that he can to anyone else in the Midlands.

He has sent, by the way, the up-todate Nürnberg list of plans etc which, if there's room, you'll also find here. Please remember that we are always very glad to have lists of plans, either from your own museum, if you are one of our museum members, or from any museum that you have got them from. The first thing that almost every new member asks me is 'what plans are available for....?' and this knowledge is very widely needed. Also, if you draw plans yourself and are willing to sell them to others, do please send me a list.

Roberto Groppetti says that he has seen in many bibliographies the book Complete Guitar Acoustics by Michael Kasha, Cove Press, Tallahassee, Florida, 1973, listed. However, he has not been able to find a copy either in Britain or in USA. Can anybody help him to locate a copy, or suggest any book shops in California (he'll be there in August) that would be worth trying? And if he still can't find a copy, could anyone provide him with a xerox?

Ronald Peel asks whether anyone can provide sources of supply of exotic timbers? Copies of any answers to me, please, since Ronald isn't likely to be the only one who would be interested. I have had a few sources which I've listed in recent Bulls, but the more the better.

Both Robert Dougan and Enzo Puzzovio have asked me recently for a supplier of semitone levers or blades for smallish harps. It seems to me to be a pity to put such blades harps that never had them originally, but I suppose that many of us make 'modern' forms of our instruments as well as the more authentic ones. If that's what the customer wants.....

Similarly, perhaps, Charles Crabtree is very interested in easy-to-make and easy-to-play instruments for children, based loosely on historical instruments, and would welcome contact with other members interested in the same general area. It's a pity that we have lost touch with Bryan Tolley who, despite all the furore over Comm.100, which ran on through several Qs, was very successful in that line and had a good early music ensemble at his school with children playing instruments that they had made themselves. However 'loosely based' such instruments are, they can often lead to better things as the children grow up.

Lukáš Matoušek would be very grateful to anyone who would send him pictures of medieval and renaissance instruments, if possible with details of the source, from 1200-1500. He has just finished an article for Early Music on the von Bülow brass, on which he has found four musicians that had not previously been noticed (see Godwin in EM 5/2), and he has also just finished making a small gothic harp and a 4-string citole which his ensemble have been using for concerts and broadcasts.

COURSES: The Sommer-Akademie J.S.Bach has a Bach-Mendelssohn course this summer from 1st to 15th August with, as well as the usual musicology and vocal and instrumental performance courses, a special Instrumentenforum on 7th & 8th August with J.H.van der Meer, Martin Skowronek, Frank Eyler, Rémy Gug, Richard Burnett, Gerald Woehl and Friedemann Hellwig. Their address is Hasenbergsteige 3, D-7000 Stuttgart 1, West Germany.

Paul Mosby is running an oboe reed-making weekend at West Dean College (West Dean, nr.Chichester, West Sussex PO18 0QZ), 4-6th June, It's a bit pricey (£53 for residents, £33 for day students) but all materials are provided, plus a concert and a trip to Howarth's factory, and Paul all-but guarantees that every student will have made at least one first rate reed by the end of the weekend.

He and a number of others (Simon Hunt, flute; Phil Pickett, recorder; Wilfred Goddard, clarinet; Cecil James, bassoon, one of the very few professional players of the French bassoon left, among others) are running a woodwind holiday from 27th to 31st August at Grantley Hall Adult College, Ripon, North Yorkshire HG4 3ET. The course coincides with one on archery, so if you can't play them.... Is William Tell in the repertoire?

Christopher Challen is directing a three-year apprenticeship course in instrument making, also at West Dean College (address at foot of previous page), starting in September. He hasn't told me what instruments will be covered.

I would be glad to hear of any such training schemes, with as much detail as possible, as I do often get asked 'where can I learn to make instruments?' by people, both in this country and from abroad, and I only know of the London College of Furniture and Newark Technical College (and I don't know whether the latter covers anything except violins).

Doreen & Michael Muskett are running courses, both for makers (too late,it was in March) and players (16-18 April, too late again, and 21-23 May, perhaps just in time) of the hurdy-gurdy. If you want to hear about future courses, write to them (address on p.4, first paragraph), preferably with £1 so that they put you on the mailing list for their newsletter.

MY MOVEMENTS: I'm off to Israel on holiday, more or less as soon as I've finished typing this, which means that when I come back and do the List of Members at the end of this month, I shan't be able to put in any late entries. We thought that this would combine getting this and the rest of the Q to the printers as soon as possible and keeping the Memb.List as up to date as possible, and getting it all out by, we hope, mid-May. If I did the Memb.List now, too many of you wouldn't be in it as the reminders went out too late.

In the summer (June 11-20) I hope to be touring Norway, Sweden and Denmark with CIMCIM (Comité International des Musées et Collections des Instruments de Musique) and meeting a number of members in those countries - it depends on whether the University will help with the cost. If you're in thosecountries, the instrument museums know where we are on each day, and I look forward to meeting you.

The rest of the summer I expect to be here, sticking instruments into cases and labelling them. If you want to come, ring up first or write because if I take a day off, we're closed, and also because if the building is locked, with me in it, I can let you in if I know you're coming but not otherwise. It is sometimes shut out of term, even if I'm here.

YOUR MOVEMENTS: When you travel, do take your List of Members with you. You'd be surprised how many people come here and ask me whom they should visit, and then, when I tell them, they haven't got the List with the addresses in it with them. I go to a lot of trouble to prepare it, and you pay quite a bit for it, so do use it.
And do tell me if you find any errors in it!

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STOP PRESS - STOLEN INSTRUMENTS: Two instruments have been stolen from the Musikmuseet in Stockholm. One is a violin by Joachim Tielke, Hamburg 1687, with a Cleopatra head as a scroll; it's illustrated in Hellwig's book if you have a copy of that. The other is a 4-string viola d'amore, without sympathetic strings, about violin size, by Christoph Meyer, Danzig, 1685, with a human-head scroll and a body of elaborate woods. They were stolen at the end of March.

The Swedish police have been told, of course, and it is presumed that they have alerted Interpol. If you see these instruments, and especially if you are offered them, please try to delay their movement (you know, show interest, can I make up my mind tomorrow, and so on) and inform your local police and the museum; their telephone number is Sweden 08-63 39 39, and I'm sure that they'll reimburse you the cost of a phone call from anywhere. Whether they'll reimburse you for buying the instruments, I can't say, but obviously they are very keen to get them back.

ONE QUERY: (just got under the wire before this went off) Paul Kemner asks how were/are cylindrical bores (ie renaissance flutes) smoothed after drilling? JM wonders whether they were - doesn't one use a sharp reamer whatever the shape of the bore, simply passing the same tool right through if it's cylindrical? That of course raises the question whether Eric Halfpenny was right in assuming that the 'cork' (actually wood) of his bass flute was integral. Paul's question also assumes that they were smoothed; I remember previous discussion on conical bores, where it was said that they worked better slightly rough, or at least not polished. Anyway, having revealed my (JM's) ignorance, over to you. Answers to me as well as to Paul please for inclusion in future bulls.

G E R M A N I S C H E S   N A T I O N A L M U S E U M
D-8500 Nürnberg 11 - Postfach 9580

Documentation of Historical Musical Instruments

Literature on the Collection of Musical Instruments:

John Henry van der Meer, Wegweiser durch die Sammlung Historischer Musikinstrumente (Guide through the Collection of Musical Instruments, also containing a list of instruments on display). In German. New edition in preparation. DM

John Henry van der Meer, Catalog of the European Musical Instruments in the Germanisches Nationalmuseum Nürnberg, vol. I, Horns and Trumpets - Membranophones - Idiophones, 220 pp., 195 photographs, cloth bound (in German). DM 130,--

John Henry van der Meer, Short Catalog of the Extra-European Musical Instruments, 1979, 56 pp. (typewritten), in German. DM 24,--

Friedemann Hellwig, Aus der Arbeit der Restaurierungswerkstätten, Ein Cembalo des 17. Jahrhunderts klingt wieder. (booklet accompanying an exhibition on the conservation of a harpsichord by Giovanni Battista Giusti, Lucca 1681, inv. no. MINe 78), 12 pp., 11 illustrations, in German. DM 2,50

Technical Drawings:

In the following, drawings of musical instruments from the collections of the Germanisches Nationalmuseum are listed. They are drawn to full scale and are obtainable as blueprints. It should be noted that they are primarily intended as documents for organological research; therefore, some of the details wanted by an instrument maker might be missing.

Radiographs:

Several hundred radiographs of musical instruments from the collections of the Germanisches Nationalmuseum have been taken. Most of them are available as contactprints on paper or duplicates on film. In addition, we will take new radiographs at the same conditions on request. Please ask for the list of radiographs already taken.

A previous list is in FoMRHI Q. 24. Ed.

Records:

Please write for special list.

Please note:

On all prices listed, postage and packing is extra. Please do not send cheques with your order but wait for our pro-forma invoice. After payment you will receive the drawings ordered.

There will be a new list once or twice per year, extended by the newly available documentation.

December 1981

TECHNISCHE ZEICHNUNGEN - TECHNICAL DRAWINGS

BLASINSTRUMENTE - WIND INSTRUMENTS

HÖRNER UND TROMPETEN - HORNS AND TRUMPETS:

MI 122	Kleiner Zink (Quartzink), Deutschland (?), 16./17. Jahrhundert. Außenansicht mit Mundstück (Innendurchmesser s. Röntgenaufnahme). 77 x 37 cm	DM	6,50
MI 120	Stiller Zink, Venedig (?), um 1600. Außenansicht (Bohrung s. Röntgenaufnahme). 77 x 37 cm	DM	6,50
MIR 42	Krummer Zink, Norditalien, 17. Jahrhundert. Außenansicht (Innendurchmesser s. Röntgenaufnahme). 77 x 37 cm	DM	6,50
MIR 74	Naturwaldhorn, Friedrich Ehe, Nürnberg um 1720. Gesamtes Instrument von 2 Seiten, mit zeitgenössischem Mundstück. 127 x 74 cm	DM	21,--
MIR 122	Jägertrompete, Balthasar Fürst, Ellwangen 1770. Gesamtes Instrument mit zeitgenössischem oder älterem Mundstück. 73 x 56 cm	DM	9,--
MIR 113	Naturtrompete Jan Sander, Hannover 1623. Mit Mundstück und textilem, dekorativem Gehänge. 93 x 85 cm	DM	18,--
MI 163	Naturtrompete, Johann Carl Kodisch, Nürnberg, um 1700 (bildet mit MI 162 ein Paar). Mit zeitgenössischem Mundstück und textilem, dekorativem Gehänge. 93 x 101 cm	DM	21,--
MI 217	Naturtrompete, Johann Leonhard (III) Ehe, Nürnberg 1746 (bildet mit MI 218 und 219 einen Satz von drei Instrumenten). Mit zeitgenössischem Mundstück und textilem, dekorativem Gehänge. 99 x 92 cm	DM	20,50
MI 173	Altposaune, Hieronimus Starck, Nürnberg 1670. Gesamtes Instrument mit zeitgenössischem (?) Mundstück. 99 x 55 cm	DM	12,--
MI 167	Tenorposaune, Anton Drewelwecz, Nürnberg 1595. Gesamtes Instrument, ohne Mundstück. 134 x 55 cm	DM	17,--
MI 168	Baßposaune, Isaac Ehe, Nürnberg 1612. Gesamtes Instrument. 176 x 66 cm	DM	26,--

FLÖTEN UND ROHRBLATTINSTRUMENTE - FLUTES AND REED INSTRUMENTS:

MI	90(BO)	Oboe, Jacob Denner, Nürnberg um 1710. Diagramm des Innendurchmessers. 175 x 30 cm	DM	11,50
MI	94(BO)	Barytonoboe, Johann Christoph Denner, Nürnberg. Diagramm des Innendurchmessers. 220 x 30 cm	DM	15,--
		Siebenteiliger Satz von Blockflöten, Hironymus Franciskus Kynsecker, Nürnberg, um 1675. Diagramme der Innendurchmesser:		
MI	98/99(BO)	Diskantblockflöten (auf einem Blatt) 155 x 30 cm	DM	10,50
MI	100/101(BO)	Altblockflöten (auf einem Blatt) 185 x 30 cm	DM	12,50
MI	102/103(BO)	Tenorblockflöten (auf einem Blatt) 210 x 30 cm	DM	14,--
MI	104(BO)	Baßblockflöte 160 x 30 cm	DM	11,--
MI	139/140(BO)	Zwei Altblockflöten, Jacob Denner, Nürnberg Anfang 18. Jahrhundert (auf einem Blatt) Diagramme der Innendurchmesser 215 x 30 cm	DM	14,50
MI	257(BO)	Querflöte mit 2 auswechselbaren Mittelstücken, Jacob Denner, Nürnberg, um 1715 Diagramm des Innendurchmessers 193 x 30 cm	DM	13,--
MIR	200(BO)	Altblockflöte, Johann Heinrich Eichentopf, Leipzig, um 1730. Diagramm des Innendurchmessers 125 x 30 cm	DM	8,50
MIR	201(BO)	Altblockflöte, Joh. Wilh. Oberlender, Nürnberg, um 1735. Diagramm des Innendurchmessers 130 x 30 cm	DM	9,--
MIR	208(BO)	Tenorblockflöte, Johann Christoph Denner, Nürnberg, Ende 17. Jahrhundert. Diagramm des Innendurchmessers 135 x 30 cm	DM	9,--

MIR	297	Querflöte mit 7 auswechselbaren Mittelstücken. Karl August Grenser, Dresden, um 1775. Zeichnung aller Teile und Diagramme der Innendurchmesser in der Achse der Tonlöcher und quer dazu. 115 x 100 cm	DM	26,--
MIR	370(AU)	Oboe, Jacob Denner, Nürnberg, um 1720. Zeichnung des Äußeren, der Unterschneidung der Grifflöcher, div. Schnitte. 86 x 50 cm	DM	10,--
MIR	370(BO)	Das gleiche Instrument. Diagramm des Innendurchmessers. 175 x 30 cm	DM	11,50
MIR	371(BO)	Oboe, Jacob Denner, Nürnberg, um 1720. Diagramm des Innendurchmessers. 175 x 30 cm	DM	11,50

SAITENINSTRUMENTE - STRINGED INSTRUMENTS

LAUTEN USW. - LUTES ETC.:

MI	54	Laute, Laux Maler, Bologna, 1. Hälfte 16. Jahrhundert. Rücken und Fragmente der Decke in mehreren Ansichten. Balken im vorgefundenen Zustand, Deckenstärken. Zusätzlich in kleinerem Maßstab: Versuch einer Rekonstruktion des Äußeren des Instruments (5 x 2 + 1 Saiten). 135 x 87 cm	DM	26,50
MI	56	Baßlaute, Michael Hartung, Padua 1599. Decke mit Balken. 63 x 45 cm	DM	6,50
MI	44	Großoktav-Baßlaute (8 x 2 Saiten), Michael Hartung, Padua 1602. Vollständiges Instrument, mehrere Schnitte, Decke mit Balken und Stärkenangabe. 215 x 95 cm	DM	45,--
MI	45	Laute (ursprünglich kleine Theorbe? 9 x 2 + 2 x 1 Saiten), Pietro Railich, Venedig 1644. Vollständiges Instrument, mehrere Schnitte. Bebalkung der Decke, Stärkenangabe, s. auch Röntgenaufnahme. 2 Blätter: 111 x 91 cm und 61 x 47 cm; zus.	DM	26,50
MI	55	Theorbe, Christofolo Hoch, Venedig um 1650, verändert von Leopold Widhalm, Nürnberg 1757. Decke mit Stärkenangabe und Balken in ursprünglichem und verändertem Zustand. 51 x43 cm	DM	5,--

MI	245	Laute mit verlängerten Baßsaiten (5 x 2/6 x 2 + 2 x 1 Saiten; 96,8/69,6 cm), Martin Hoffmann, Leipzig 169.. Vollständiges Instrument in mehreren Ansichten und Schnitten. 170 x 97 cm	DM 37,--
MIR	908	Große Theorbe, Mathias Alban, Bozen 1704. Decke mit Balken, Stärkenangaben. 82 x 52 cm	DM 9,50

STREICHINSTRUMENTE - BOWED STRINGED INSTRUMENTS:

MIR	782	Pardessus de viole, Michel Colichon, Paris, Ende 17. Jahrhundert. Vollständiges Instrument in mehreren Ansichten. 98 x 81 cm	DM 18,--
MI	6	Tenor-Viola da gamba (D-d^1), Hans Pergette, München 1599. Vollständiges Instrument in mehreren Ansichten und Schnitten Deckenstärken. 223 x 90 cm	DM 45,--
MI	5	Große Baß-Viola da gamba (D_1-d, G_1-g?), Hans Vogel, Nürnberg 1563. Vollständiges Instrument in mehreren Ansichten. 1 Blatt (in 2 Teilen) 120 x 211 cm	DM 56,--
MIR	843	Violoncello piccolo á 5 corde (ursprünglich Viola da gamba ?) Andreas Jais, Tölz 1724, Decke mit Stärkenangaben. 85 x 50 cm	DM 9,50
MIR	940	Arpeggione, datiert 1851. Gesamtansicht von vorne und der Seite, Decke mit Baßbalken und Stärkenangabe. 110 x 68 cm	DM 16,50

DREHLEIERN - HURDY-GURDIES:

MI	73	Drehleier (en guitarre), Deutschland 17./18. Jahrhundert. Drei Ansichten, ornamentale Details. 140 x 80 cm	DM 25,--
MINe	52	Drehleier (en luth), Lesnier, Charenton 1851. Diverse Außenansichten, mehrere Schnitte durch die Innenkonstruktion 180 x 82 cm	DM 33,--

TASTENINSTRUMENTE - KEYBOARD INSTRUMENTS

CLAVICHORDE - CLAVICHORDS:

MIR 1047	Gebundenes Clavichord (hexagonal, C-c^3), Süddeutschland, 2. Viertel 18. Jahrhundert. Gesamtansicht, mehrere Schnitte. 143 x 98 cm	DM 31,50
MIR 1061	Bundfreies Clavichord (F_1-f^3), Johann Heinrich Silbermann, Straßburg, um 1770. Gesamtansicht, mehrere Schnitte. 270 x 85 cm	DM 52,--

CEMBALI USW. - HARPSICHORDS ETC.:

MINe 95	Virginal (8'; C/E-c^3), Artus Gheerdinck, Amsterdam 1605. Mehrere Ansichten und Schnitte, ornamentale Details. 357 x 97 cm	DM 78,--
MI 263	Oktavcembalo (4'4'; c/e-c^4), Italien, 2. Hälfte des 17. Jahrhunderts. Verschiedene Ansichten und Details. Äußerer Kasten. 154 x 94 cm;	DM 33,--
MIR 1073	Cembalo (einmanualig; 8'4; C/E-c^3), Andreas Ruckers, Antwerpen 1637. Mehrere Ansichten und Schnitte, div. dekorative Details. 2 Blätter 285 x 85 cm	DM 109,--
MIR 1080	Clavicitherium (8'4'8'; C/E-f^3), Deutschland, 1. Hälfte 17. Jahrhundert Schnitt durch die Mechanik bei der obersten und untersten Taste. 88 x 54 cm	DM 10,50
MIR 1078	Cembalo (doppelmanualig, 4'/8'8; C/E-c^3), Italien, 17. Jahrhundert. Gesamtansicht von oben und der Seite, mit genauer Innenkonstruktion und Stärkenangabe des Resonanzbodens. Ohne äußeren Kasten und Gestell. 248 x 110 cm	DM 60,--
MINe 78	Cembalo ("false inner-outer", 8'8, C/E-c^3, Giovanni Battista Giusti, Lucca 1681. Drei Ansichten. Die Innenkonstruktion wurde nach einer Röntgenaufnahme gezeichnet. 244 x 100 cm	DM 54,--

MIR 1075	Cembalo (G_1-c^3; 8'8), Carlo Grimaldi, Messina 1697. Aufsicht und Seitenansicht mit mehreren Schnitten und Detailzeichnungen. Die Innenkonstruktion des Instruments wurde nach Röntgenaufnahmen gezeichnet. Äußerer Kasten mit Ornamentation. 2 Blätter á 283 x 107 cm	DM 136,--
MI 449	Cembalo (8'8; G_1/H_1-e^3), Christian Vater, Hannover 1738. Gesamtansicht mit mehreren Schnitten und Detailzeichnungen. 373 x 100 cm	DM 84,--
MIR 1077	Cembalo (8'8'; rekonstruierter Umfang: F_1-g^3 ohne fis; false inner-outer), Roberto und Frederigo Cresci, Livorno 1778. Vollständiges Instrument in mehreren Ansichten und Schnitten; Untergestell. 387 x 105 cm	DM 92,--

HAMMERFLÜGEL - FORTEPIANOS:

MINe 100	Hammerflügel, Johann Schmidt, Salzburg 1790. Schnitt durch die Mechanik. 62 x 42 cm	DM 6,--
MINe 109	Hammerflügel (F_1-g^3), Anton Walter, Wien, um 1795. Gesamtansicht von oben, von der Seite und von vorne; Mechanik und genaue Innenkonstruktion. 274 x 161 cm (in 2 Teilen)	DM 97,--

REGALE - REGALS:

MI 79	Regal (C/E-c^3), Deutschland 1639 (von Christoph Wannenmacher 1639 der Stadtpfarrkirche von Friedberg/Hessen gestiftet). Disposition: Zunge 8', (Zimbel 1/4'). Instrument in verschiedenen Ansichten, Bälge (rekonstruiert). 2 Blätter á 106 x 71 cm; zusammen	DM 33,50
MI 80	Regal (C/E - g^2, a^2), Michel Klotz, Süddeutschland, 17. Jahrhundert. Ansicht des gesamten Instruments mit den Bälgen. 150 x 90 cm	DM 30,--

APPENDIX: Aus Anlaß von Konservierungsmaßnahmen, die vom bzw. in Zusammenarbeit mit dem Germanischen Nationalmuseum durchgeführt werden, sind Zeichnungen von folgenden

Instrumenten aus dem Besitz des Museo Civico Medievale in Bologna erhältlich:

No. 1748	Arciliuto (8 x 1/5 x 2 + 1 Saite. 134/63,5 cm), Matteo Sellas, Venedig 1639. Verschiedene Details, Berippung, aber keine Deckenstärken. 209 x 104 cm	DM 49,--
No. 1754	Große Oktavbaßlaute (10 x 2 Saiten) Magno Stegher, Venedig, Anfang 17. Jahrhundert. Mehrere Ansichten, Berippung (aber keine Deckenstärken). 266 x 95 cm	DM 57,--
No. 1766/ 1767	Clavemusicum omnitonum, Vito de' Trasuntini, Venedig 1606 (Cembalo mit einem 8'-Register und einer 31-tönigen Teilung der Oktave; Umfang C-c^3) dazu Stimmgerät des gleichen Erbauers. Ansichten von oben. Diverse Details und Schnitte. 363 x 108 cm	DM 88,--
No. 1808	Tenorlaute (Wirbelkasten und Steg verändert), Michielle Harton, Padua 1599. Mehrere Ansichten. Berippung, aber keine Deckenstärken. 177 x 92 cm	DM 37,--

EDITOR'S SUPPLEMENT TO THE BULLETIN   Djilda Segerman.

Apology to all our readers and particularly to Anatoly Zajaruzny for getting his name wrong on his two Comms 396 and 397, which we had typed for him. Though I will not shirk full responsibility for the error, I still would be grateful if authors would give their names in typing or block capitals.

Jeremy has suggested that perhaps some members may leave FOMRHI if too many papers on early instrument performance practices such as Eph's recent papers on gracing appeared in the Quarterly. He added though that there should be no objection if the issue was thin anyway and the added papers did not significantly add to cost. Eph agrees with the last point but adds that there is no other quick-publication informal place to present ideas on performance practices relevant to more than one type of instrument. He would like to encourage others to use FOMRHI quarterly as such a vehicle. If the numbers of such contributions start to affect costs significantly, perhaps a new Fellowship should split off with its own Quarterly. Comments please from members.

Incidentally I would like to remind Jeremy that it is the prerogative of the Editor to put a stop to a particular discussion in the Quarterly, and not the Hon. Sec. or the Fellow who started it (see Bulletin p. 3 concerning Comm.368.
I stand by my policy of accepting any Comm. that is constructive and for which there is space.

When Jeremy phoned saying that this was an especially thin issue, Eph set down to help fill it up with stuff people might find interesting. It was a good excuse to play with our new word-processor for the Apple microcomputer (which webought to keep track of all our customers and strings). Editing copy without having to re-type bits and use Tipp-Ex, scissors and Sellotape is a real joy. He probably wrote about twice as much as he would have done without the microcomputer. There are many things which computers are blamed for nowadays, so here is another.

There is still time to offer to give a paper for the session on instruments at the annual conference of the Royal Musical Association held this year 13 - 16 August in Manchester. The session is on Sunday morning (the 15th). No-one wants Eph to hog the show. Write to Dr Gareth Curtis, Department of Music, The University, Manchester M13 9PL. Listeners as well as speakers will of course be welcome.

Immediately after the above session (well, after some grub, anyway), crowds of peaple will be piling into cars for the short ride to beautiful Ambleside in the Lake District for the first NWEMF (North West Early Music Forum) Summer School which runs from Sunday the 15th to Friday the 20th of August. The teaching team are Joan Wess, Eph Segerman, Peter Syrus and Roger Wilkes. The topic is (as you might have guessed) Renaissance Music Performance Practices. Tasteful division and gracing will be taught and there will be lots of playing and singing. The catering is supposed to be excellent, and at £85 full residential fee this Summer School promises to be a best buy. Day visitors (who can book individual meals) will be welcome.

Propolis. Available from Gianfranco Faccini, Piazza XX Settembre 5, 48100 Ravenna Italy. Cost: 120.000 Italian Lire per Kg. plus postage.

Gianfranco Faccini also would like to know about any drawings available of baroque bows for violin, cello and gamba.

FoMRHI Comm. 403

A method of casting harpsichord roses. John Paul
- Additional details.

No sooner had I written Comm. 392 for the January 82 quarterly than I wondered if I could improve the mould making proceedure and tried out a new way which seems to work well. The mould in which the metal is cast is made of concrete and it is well known that the strongest concrete must be made with the minimum of water. The problem is that to get the wet concrete to fill the pattern detail perfectly it must be very wet and sloppy. The following compromise gives excellent results: The dry cement must be free of any lumps so if there are any, crush it and sieve. Now mix with water to make a thin cream and add a teaspoonfull of cement wetting agent (such as Admix). Pour this mix into the pattern box until the pattern is covered and vibrate in some way. (A square bar of wood set in a lathe chuck or electric drill will make a vibrator). Drop on top of the liquid cement some reinforcement material, either cement quality glass fibre or asbestos string, and also sprinkle on a little dry sand. Now full up the pattern box with a much more dry mix of sand, cement and water, doing this in layers with glass fibre or asbestos string added to each layer. Vibrate from time to time, and this will bring surplus water to the surface, which should be mopped up with dry sand and cement. The result is a mould made with a dry mix of reinforced concrete, but with a good pattern surface because it was wet and flowing to start with.

The molten metal should be poured into the cured mould as smoothly as possible to avoid splash. I have found no need to cut air channels in the mould to prevent air bubbles being trapped - the two surfaces of the double mould do not fit together so perfectly as to trap air. Air bubbles can be a nuisance if casting anything more complex than a rose, so if the system is used for difficult castings it is a good idea to have the channel for the metal pass right down into the mould and turn round and rise into the casting. The molten metal then flows upwards through the pattern cavity, pushing the air before it.

FoMRHI Comm. 404. Greg Lewin

A PROPOSED DEVICE FOR WOODWIND BORE MEASUREMENT AND ANALYSIS.

Recent attempts at measuring bassoon bores have convinced me that there must be an easier (and more accurate!) way of doing things. This feeling has been increased by the prospect of processing pages of bore measurements to allow for shrinkage and cracking.

It seems to me that these time consuming jobs could be done much more quickly, and probably more thoroughly, by electronic means. If the signal from an electronic probe could be converted directly into digital form, it could be fed straight into a micro-computer.

Once the data has been stored in the computer's memory, it should be relatively easy to have it displayed in table or graph form. It should also be possible to display 'converted' data, or to combine the readings from several axes into one single graph to give a bore adjusted for ovalling.

Friends in the computing business tell me that a device of this type could be made for about £150. It would include the probe itself, plus the electronics for converting the signal into digital form. A suitable computer would cost from £200. upwards depending on the type of 'copy' required (T.V. display or printed).

The purpose of this communication is to invite someone who understands these things to develop such a device. If you are interested, please let me know and I will pass on any ideas/suggestions that I receive between now and then,(I will also be your first customer!). Failing a volunteer, I will continue to bully my computing friends in the hope that they will come up with the solution. Either way, it would be of considerable help to hear from anyone who would be interested in the finished device if the price were right. A provisional subscription list might persuade an inventor that his efforts would be worthwhile.

I add some thoughts for comment:

1) Somewhere in the world of engineering measurement, there must be a similar device. Does anyone know about it?
2) Assuming that the finished device will be used to measure museum specimens, advice on probe design from curator members would be welcomed.
3) What range of widths and lengths are necessary? If several sizes of probe are needed, what would be the best changeover points to avoid changing in the middle of a bore?
4) What sort of accuracy is required? Is this likely to vary with instrument and purpose?
5) Suggestions for a suitable design for a probe would be welcomed.
6) Can some method of self-calibration be built into the probe or the computer program?

FoMRHI Comm. 405 R. A. Greensitt

Oddities in the Drone System of the Lissieu Musette

The Lissieu musette in the Black Gate Bagpipe Museum in Newcastle upon Tyne has been described as having six drones. On careful exploration I found that only five drones eventually reach the outlets, as follows:

drone one: one length only, total length 13.5 cm, 2.7 mm bore, one outlet;

drone two: two part lengths, total length 17 cm, 2.7 mm bore, one outlet;

drone three: two part lengths, total length 21 cm, 2.7 mm bore, one outlet:

drone four: two full lengths, total length 26 cm, 3.4 mm bore, two outlets;

drone five: two full lengths, 3.4 mm bore, no outlets;

drone six: eight lengths, total length 94 cm, first six bores 4.5 mm, last two bores 3.6 mm, nine outlets.

This arrangement limits the possible bass drone choice considerably. Was it intentional or accidental? From the position and diameters of drone five and the last two lengths of drone six, it is apparent that these could be connected to give a possible total length of 50 cm, leaving drone six with a possible length of 80 cm.

Preliminary drawings are nearly complete and a copy of the set is under construction.

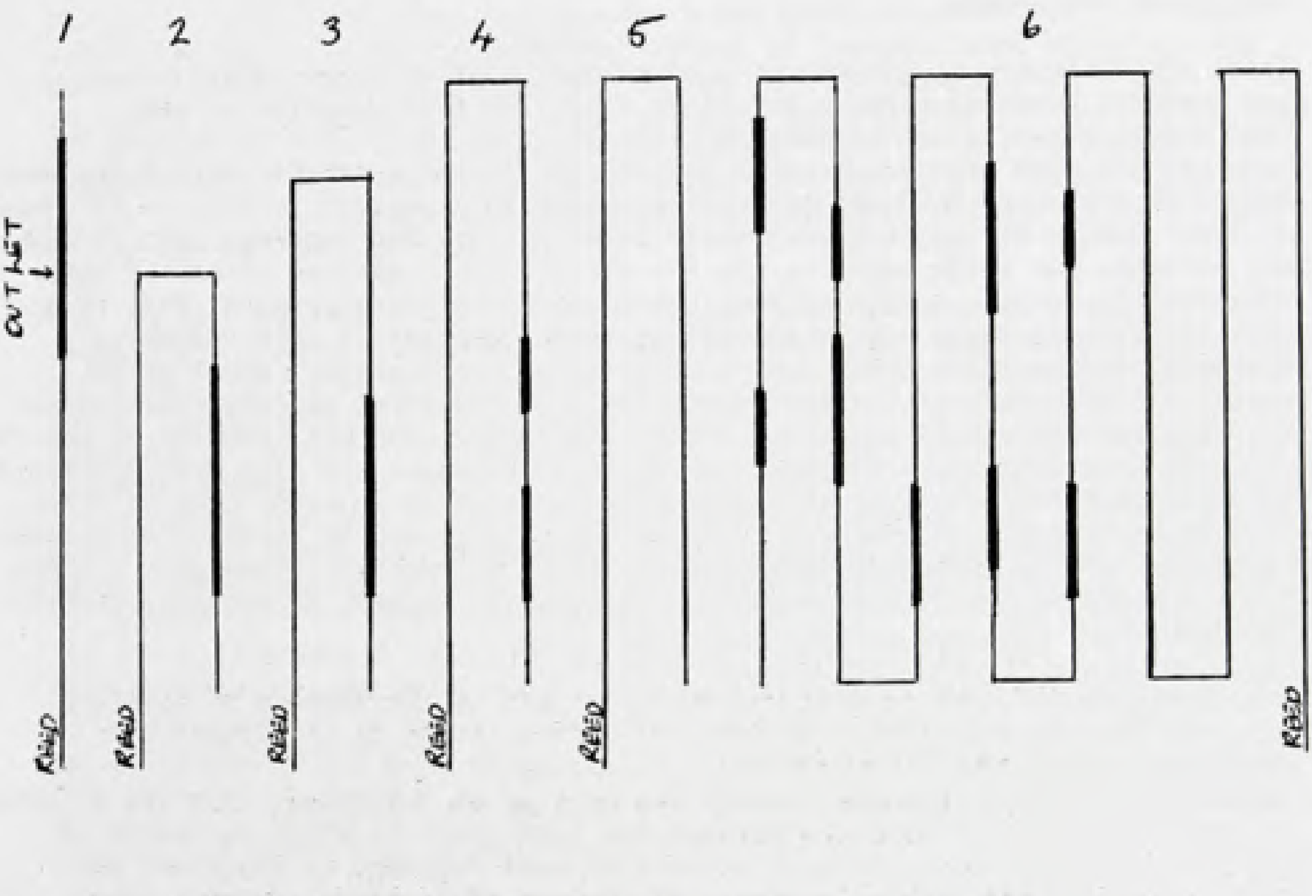


DIAGRAM OF DRONE BORE SYSTEM OF LISSIEU MUSETTE

FoMRHI Comm. 406 WOODWIND BORE OIL Cary Karp

Assuming that there is such a thing as a general purpose woodwind bore oil, there are at least three interrelated ways of going about finding it: defining the reasons why bores are treated and deducing or experimentally determining the best material for the purpose(s); using traditional ("authentic") materials for better or worse; using whatever seems to produce satisfactory results. The problem manifests itself in different ways for instrument makers, instrumentalists, and conservators. The first two groups will usually be interested in musical results and the third in the long-term material survival of the instruments. It is therefore necessary to regard instruments either as "in-use" or "passive".

With the exception of synthetic resin varnishes and petroleum derivate and synthetic oils and waxes, the materials at the disposal of earlier makers were largely the same as those available today. The use of heat treatments and chemical additives to alter the drying properties of oils are not modern techiques. (In reference to earlier F . .Q bull. there is no reason to assume that oils used by earlier makers were particularly healthy to eat.) Lacking any significant new insight into the reasons for oiling bores, the battery of traditional materials ought to provide a good jumping-off point in the search for what to use. As it is, we do not have enough experience with synthetic materials to be able to evaluate their long-term suitability for any purpose. Such materials will be dealt with in passing in the discussion of the more traditional materials.

There are three groups of materials which need consideration: oils, waxes, and lacquers (defined here as any resin dissolved in a volatile solvent). Some modern makers claim to have obviated the need for oiling by sealing the bore surface with lacquer. Despite the fact that some synthetic resins are more suited to this task than natural resins, we would expect at least some evidence of older makers having lacquered their bores if they had regarded this in any way suitable for their purposes. To the extent that a desired effect of bore treatment is leaving a film of some substance on the bore surface, this film will either have to be highly impervious to any mechanical wear (swabbing, thermally and humidity induced bore dilation and contraction, etc.) or be easily replenishable by the instrumentalist. In the first case neither lacquer nor oil is particularly suitable, but in the latter case oil, whether or not it dries to a hard film, is far superior to lacquer. Waxes are also very difficult to apply in a thin film unless dissolved in a volatile solvent. Once in place, however, wax may be smeared around by swabbing,etc., and is inferior to lacquer which will simply powder or flake out of the bore, entirely. Thus oils are the likeliest alternative for bore surface coating as, indeed, traditional practice indicates.

Thin films of oil (wet or dry) are poor barriers to the passage of moisture. (In reference to a query in the last bull, this factor is irrelevant when dealing with bellows-blown bagpipes.) A coating of bore oil is therefore not likely to provide much protection to the body of an instrument from the effects of the moisture which is blown through the instrument or which condenses on the bore surface. Again, if such protection were regarded as important one might expect to see greater evidence of the use of lacquers, despite their other weaknesses. Any protection which oil offers against moisture is not likely to be due to a film which it forms on the bore surface, aside from the short period it takes for a cold instrument -- which is especially susceptible to the effects of humidity and thermally induced expansion -- to warm up. (This may, of course, be quite significant.)

Oils, waxes, and lacquers will all fill the open "pores" of a bore surface and, with the exception of non-drying oils (which are more easily squooshed out of the pores as the wood expands and contracts), are equally suitable for this task, which is the most important one in the moisture barrier department (sealing the end grain of tenons, sockets, etc.). If the only reason for filling pores were acoustical we might expect condensed moisture to do the job perfectly well. Therefore, pore filling is likely to be one of the traditional reasons for bore treatment, whereas providing a moisture barrier film may very well not.

It is harder to speculate about other effects of the material which soaks into the body of an instrument. If this material behaves as an oil it might well lubricate the wood fibers as they move against each other. If it hardens it will reduce this movement and thus provide some dimensional stability, but might also embrittle the instrument and make it less able to withstand the strains to which it is normally subjected. If drying oils are used as a filler, hard plugs of polymerized (dried) oil are formed near the bore surface which effectively terminate (or at least radically reduce the rate of) the absorbtion of oxygen into the deeper-lying oil which thus remains liquid. Drying oils therefore both close pores and provide a sealed-in reservoir of "lubricant" within the wood. If the "stiffening" effect of lacquers were traditionally desired we would, yet again, expect to see more evidence of their use. It is also possible to speculate on other chemical and physical changes in the wood which an oil treatment might produce (somehow "curing" it), as well as changes in the atmosphere contained in the bore due to oil vapors. Here too, we can expect the traditional materials to have been chosen with some regard to any such effects.

The little documentary material that exists about historical practice indicates that linseed oil was the oil used by instrument makers. Compared with the other plant oils which were at the disposal of the older makers linseed oil is the quickest drying, densest, has the lowest solidification point (temperature at which it turns to "fat"), and forms the hardest polymer. Presumably there were reasons for this choice other than mundane factors such as price and availability. It should also be noted that some type of oil is necessary to lubricate the wood and cool the tools during boring and reaming. In any case, linseed oil treatment in the production of historical woodwind is "authentic". The historical documentary material advises, however, against the use of linseed oil for regular maintainance, recommending instead water, non-drying oils, and volatile oils. Disregarding historical precedent animal oils might also be used, but these often become rancid too quickly, solidify at too high temoeratures, and are generally unpleasant. (Sardine oil has about the same drying characteristics as peanut oil, but I don't think anyone uses it as bore oil.) Synthetic oils may also be useful, silicon oil being included in some modern commercial mineral-base bore oils.

Plant oils can be classified in three ways: drying oils, which when exposed to air absorb oxygen, gain in weight, and dry to a hard but elastic polymer (as linseed oil); "non-drying" oils, which (at least over long periods of time) do not become hard or gummy (as olive oil); volatile oils, which are generally fragrant oils that volatilize slowly at ordinary temperatures (as lavender oil). There can be tremendous variation in composition among nominally identical oils (consider the tastes of different brands of olive oil) and any discussion of the various characteristics of oils will be based on some very broad generalizations. Unfortunately, the properties of an oil which interest us are highly dependent on the origin and method of preparation of the oil. The historical record is saddeningly deficient on this point.

Although most woodwind makers and players will insist that oiling has noticable audible consequences there has yet to be any systematic investigation into the mechanisms by which oil makes its presence heard. It is obvious that oil effects the frictional characteristics of the bore surface, fills pores, etc.. The extent to which any oil effects a given instrument will therefore depend on the type and finish of the wood concerned. An instrument made of a light fruit wood may require heavy impregnation with oil simply to become "airtight". In this case oiling is absolutely necessary, at least as a step in manufacture. An instrument made of grenadilla with a highly polished bore (which absorbs very little of either water or oil) is likely to be quite indifferent to oiling. The makers of modern woodwind tend, in fact, to discourage the practice of oiling entirely, as the danger posed to key pads and toneholes by excess oil far outweighs the possible tonal advantage of oiling.

A first guideline can now be formulated: There is no reason to oil an instrument unless there is some positive advantage in doing so. Any acoustic advantage can easily be determined by quick experiment. The need for oiling as a moisture barrier is more difficult to determine. The makers of historical woodwind have always tended to slop a lot of linseed oil into their instruments during production, both to treat the wood in all the above mentioned senses and as a lubricant for cutting tools. As a result any moisture barrier which oil provides is built into the instrument. Whether or not this barrier needs regular replenishing remains an open question. A thin film of oil applied by the instrumentalist is, however, not likely to provide significant additional protection. The following very tentative restatement of the above guideline suggests itself: Unless you can hear an improvement in the sound of an instrument when it is oiled, it need not be oiled.

A thin film of linseed oil will dry in 8 or10 days if kept warm and dry and exposed to light. It will take weeks, if not months, for the oil on the surface of a bore to dry thoroughly enough to seal in the remainder of the oil in the wood, which being cut off from the air will proceed to dry very slowly, if at all. If the instrument is taken into use before the oil on the bore surface has dried, the drying will not proceed and the oil will eventually be flushed or swabbed out of the instrument entirely. The same applies to non-drying oils, and volatile oils dissappear of their own accord. In the long run the only oil which remains in the walls of an instrument is that which is sealed in by a layer of hardened oil. (The aging properties of polymerized oil under playing conditions are, however, largely unknown.) Another guideline can now be formulated: There is no reason to worry about any deleterious effects of oiling an in-use instrument(other than gumming up pads, windways, etc.).

Before proceding to the case of the passive (museum) instrument one important point must be clarified. At the "Symposium for Restorers of Non-Keyboard Musical Instruments", held at the Germanisches Nationalmuseum in Nuremberg May 7-10, 1974, bore oil was discussed by several speakers. As a part of his own contribution, Rainer Weber made the observations that woodworms almost never tunnel through the hardened oil at a bore surface (he illustrated this with x-radiographs) and that the slightly acidic environment created by linseed and other plant oils was desirable as it inhibited the growth of microorganisms. When another speaker suggested the use of acid-free liquid paraffin as a bore oil Rainer Weber advised categorically against this, stating that paraffin promotes the growth of microorganisms and that it tends to leach out the natural oils and waxes from the wood. He reported having worked intensively on the problem with a chemist and finding that peanut oil, having a suitable pH value and being the slowest drying of the plant oils tested, was to be recommended for maintainance use. He did not make any comment about liquid paraffin causing cracking(as reported in the last bull. The suggestion that one can oil an instrument with anything and then proceed to watch it crack "into little pieces" -- even after a decade's wait --is absurd. It should probably also be mentioned that a similar dire warning against the use of linseed oil, made several years ago in a Galpin Society Bulletin on the basis of information reportedly supplied by the British Museum Conservation Laboratory, was dismissed as totally unfounded by Anthony Werner, then director of that lab, upon my direct question.). The comments on paraffin and peanut oils caused some surprize at the symposium and I was not aware that the recommendations had subsequently been generally adapted by woodwind specialists.

Museum opinion is pretty much against oiling woodwind bores. As far as conservation goes oiling does nothing of recognized positive value. We know little about the long term effects of oiling (regardless of the type of oil) on instruments which are kept under passive museum conditions, but since these may be negative there is no justification in the application of this non-reversible procedure. In other situations where conservators coat wood with oil the process is regarded as safe as long as "four coats of oil are wiped off for every three applied". Presumably the only hinderance to doing so with a bore is the lack of a mechanically safe way of removing the surplus oil. As far as brief periods of playing upon museum instruments is concerned, if there is any reason to doubt that an unoiled instrument can withstand such use, there is no reason to expect a bit of oil to provide any greater safety. The protracted use of any museum woodwind will expose it to risks which are unacceptable from the conservator's point of view, again regardless of whether or not the instrument has been oiled. If a long-dormant instrument is to be revived for continuous use (which should not be a museum concern) oiling, possibly with a drying oil, may well be part of the restoration procedure. We do not know what happens when an instrument which has been oiled with a drying oil is left undisturbed for tens or hundreds of years. Fresh cracks in old instruments can smell of linseed oil, suggesting that the oil sealed in the walls of an instrument neither dries nor becomes rancid. On the other hand, if the oil did dry straight through we would expect the polymerizing oil to be able to exert force sufficient to alter an instrument's dimensions. Whether dried oil has ever actually cracked an instrument remains to be established. The long term effects of leaving non-drying oils in bores are also unknown. There have been no reports of non-drying oils causing trouble but it is possible that <u>all</u> non-volatile plant oils will dry sooner or later.

Characteristics of common plant oils which may be of interest are: the solidification point-- the temperature at whcih oil starts to act like fat; density-- the mass per unit volume of oil; the iodine value-- a measure of the unsaturated linkages present in an oil, indicating its propensity for drying-- the number of grams of iodine absorbed by 100 g of oil. An iodine number in excess of 100 is usually regarded as characteristic of a drying oil; below 100 of a non-drying oil. There is no clear boundary and non-drying may in reality only mean "extremely slow" drying. To the extent that oil somehow lubricates the wood against internal strain, as low a solidification point as possible will be desirable. To the extent that oil adds "body" to a piece of wood, as dense an oil as possible will be beneficial. The moisture barrier properties of all oil films are poor, but the denser the oil the better.

A table pinched from the 56th ed. of the CRC Handbook of Chemistry and Physics:

Fat or Oil	Source	Melting (or Solidification) Point, °C	Specific Gravity (or Density)	Iodine Value
Plants				
Babassu oil	*Attalea funifera*	22–26	$(0.893^{25°})$	15.5
Castor oil	*Ricinus communis*	(−18.0)	$0.961^{15°}$	85.5
Cocoa butter	*Theobroma cacao*	34.1	$0.964^{15°}$	36.5
Coconut oil	*Cocos nucifera*	25.1	$0.924^{15°}$	10.4
Corn oil	*Zea mays*	(−20.0)	$0.922^{15°}$	122.6
Cotton seed oil	*Gossypium hirsutum*	(−1.0)	$0.917^{15°}$	105.7
Linseed oil	*Linum usitatissimum*	(−24.0)	$0.938^{15°}$	178.7
Mustard oil	*Brassica hirta*	....	$0.9145^{15°}$	102
Neem oil	*Melia azadirachta*	−3	$0.917^{15°}$	71
Niger-seed oil	*Guizotia abyssinica*	....	$0.925^{15°}$	128.5
Oiticica oil	*Licania rigida*	....	$0.974^{25°}$	140–180
Olive oil	*Olea europaea sativa*	(−6.0)	$0.918^{15°}$	81.1
Palm oil	*Elaeis guineensis*	35.0	$0.915^{15°}$	54.2
Palm-kernel oil	*E. guineensis*	24.1	$0.923^{15°}$	37.0
Peanut oil	*Arachis hypogaea*	(3.0)	$0.914^{15°}$	93.4
Perilla oil	*Perilla frutescens*	....	$(0.935^{15°})$	195
Poppy-seed oil	*Papaver somniferum*	(−15)	$0.925^{15°}$	135
Rapeseed oil	*Brassica campestris*	(−10)	$0.915^{15°}$	98.6
Safflower oil	*Carthamus tinctorius*	....	$(0.900^{60°})$	145
Sesame oil	*Sesamum indicum*	(−6.0)	$0.919^{25°}$	106.6
Soybean oil	*Glycine soja*	(−16.0)	$0.927^{15°}$	130.0
Sunflower-seed oil	*Helianthus annuus*	(−17.0)	$0.923^{15°}$	125.5
Tung oil	*Aleurites fordi*	(−2.5)	$0.934^{15°}$	168.2
Wheat-germ oil	*Triticum aestivum*	....	....	125

In summary: woodwind made of materials which can absorb linseed oil are traditionally impregnated, or at least generously coated with linseed oil during manufacture. (Other woods such as grenadilla and rosewood contain loads of their own waxes and oils.) Oiling is not an obligatory part of the maintainance of a woodwind instrument but can be done with impunity whether or not it is felt to be necessary. When oiling an instrument which is not in use, no excess oil should be left on the instrument's surface (wipe off more oil than you apply). The choice of oil is probably not worth a fuss, but if the possible consequences of using a drying oil are a concern it is best not to use any oil which leaves a permanent film. Perhaps it is just as well not to use any oil at all!

FoMRHI Comm. 407

ORPHARION NEWS E. Segerman

Wolfgang Meyer (6520 Worms, Erenburger Str. 16, West Germany) has written to us, mentioning that there is an orpharion in the Frankfurt Historisches Museum that seems to be unknown amongst the organological community. He sent the photos reproduced here and reported that the string stop varies from 42.5 cm in the treble to 48 cm in the bass.

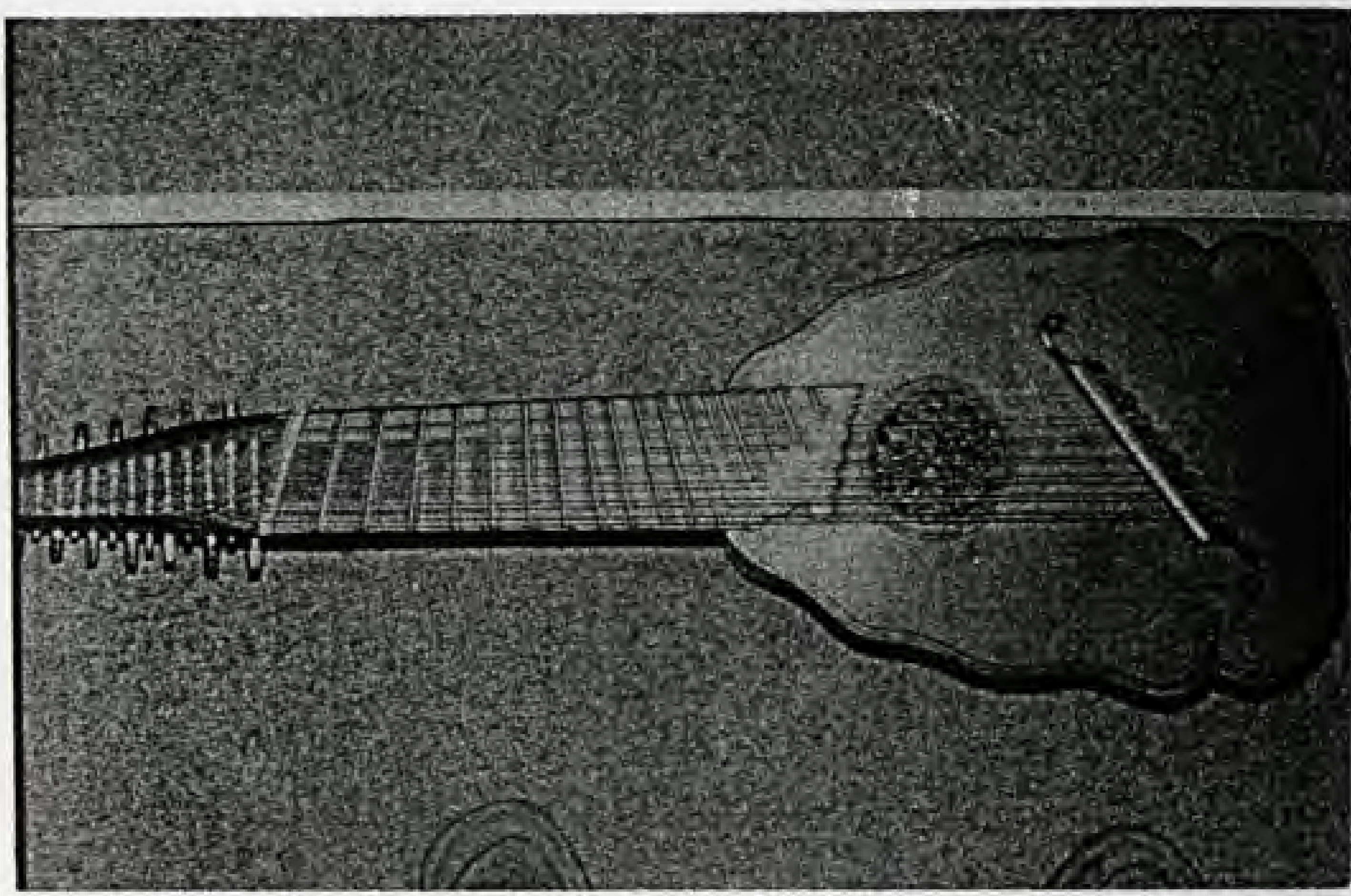
Relative to a′ = 440 Hz , the length of the highest string allows it to be tuned about as high as f′ if it were made of iron and about c♯" if it were of Renaissance steel. The fret angling gives three semitones more maximum range in the bass than the string properties would allow with parallel bridge and nut. Since string inharmonicity reduces the useful range in smaller instruments, it is likely that this instrument was intended to provide the same open-string range as larger instruments of this type, two octaves and a tone with iron treble strings and two octaves and a fifth with steel. The latter larger range is more likely for an 8-course instrument. Since steel was unavailable after about 1620, the instrument would either be from before then or from late in the 17th century onwards when overspun strings could provide the added range in the bass.

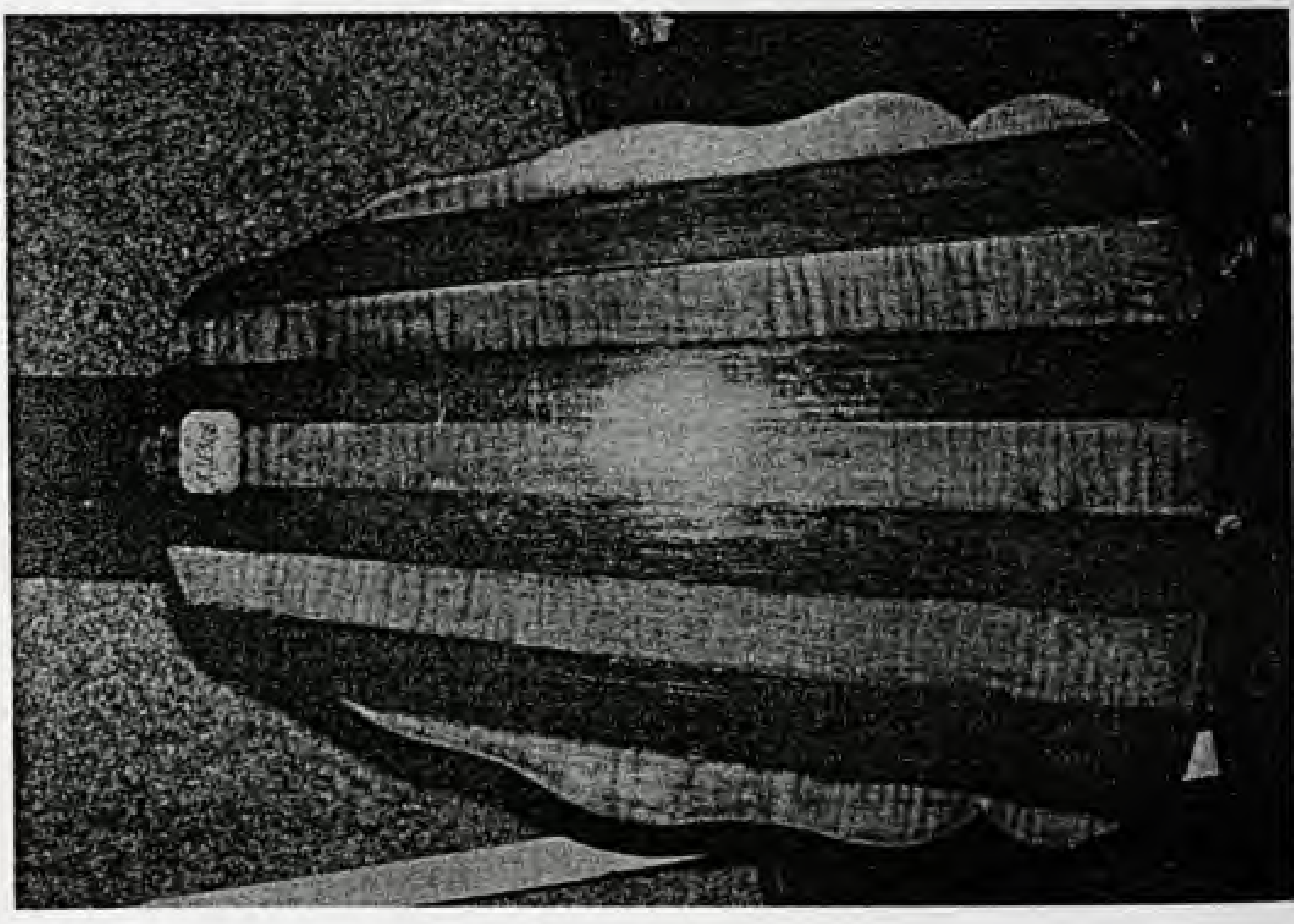
From the photos, some aspects of the instrument seem unlikely to be original. With over 2cm between pegs on each side of the pegbox, there should be no need for tuning by tuning key and we would expect normal pegs. The guide pins at the nut position also should not be necessary (but can be a useful corrective for design faults). The soundboard and bridge do not show the signs of age and use that the body, rose and fingerboard do. The fingerboard has been refretted to get a more equal temperament than an earlier fretting system.

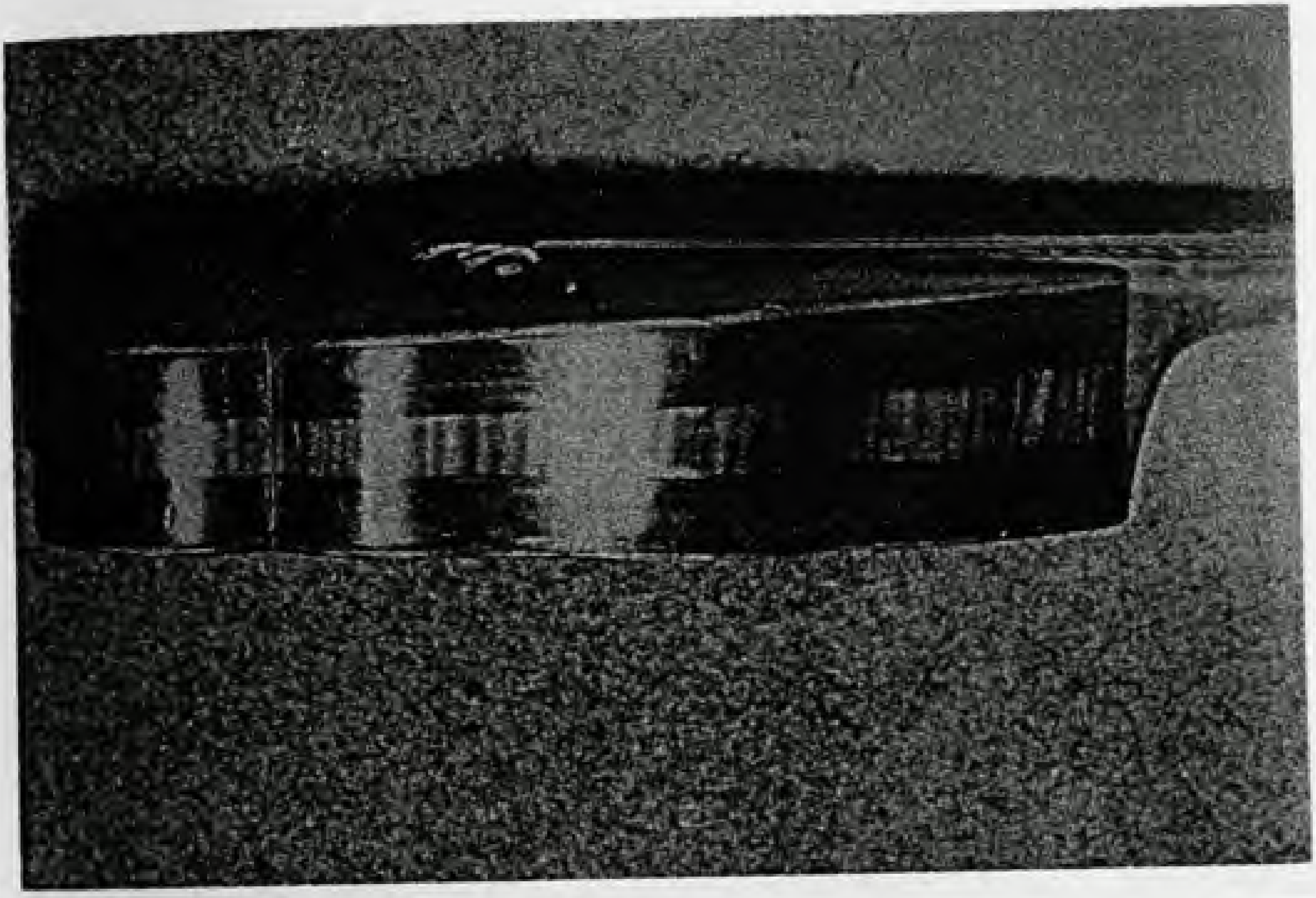
Peter Forrester who has seen these photos has noticed that the shape of the instrument is almost identical to that which appears as decoration on one of Tielke's instruments, and that the decoration on the back of the pegbox of this instrument is almost identical to that on one of Tielke's viols. This decoration on the orpharion also seems not to show any effect of age.

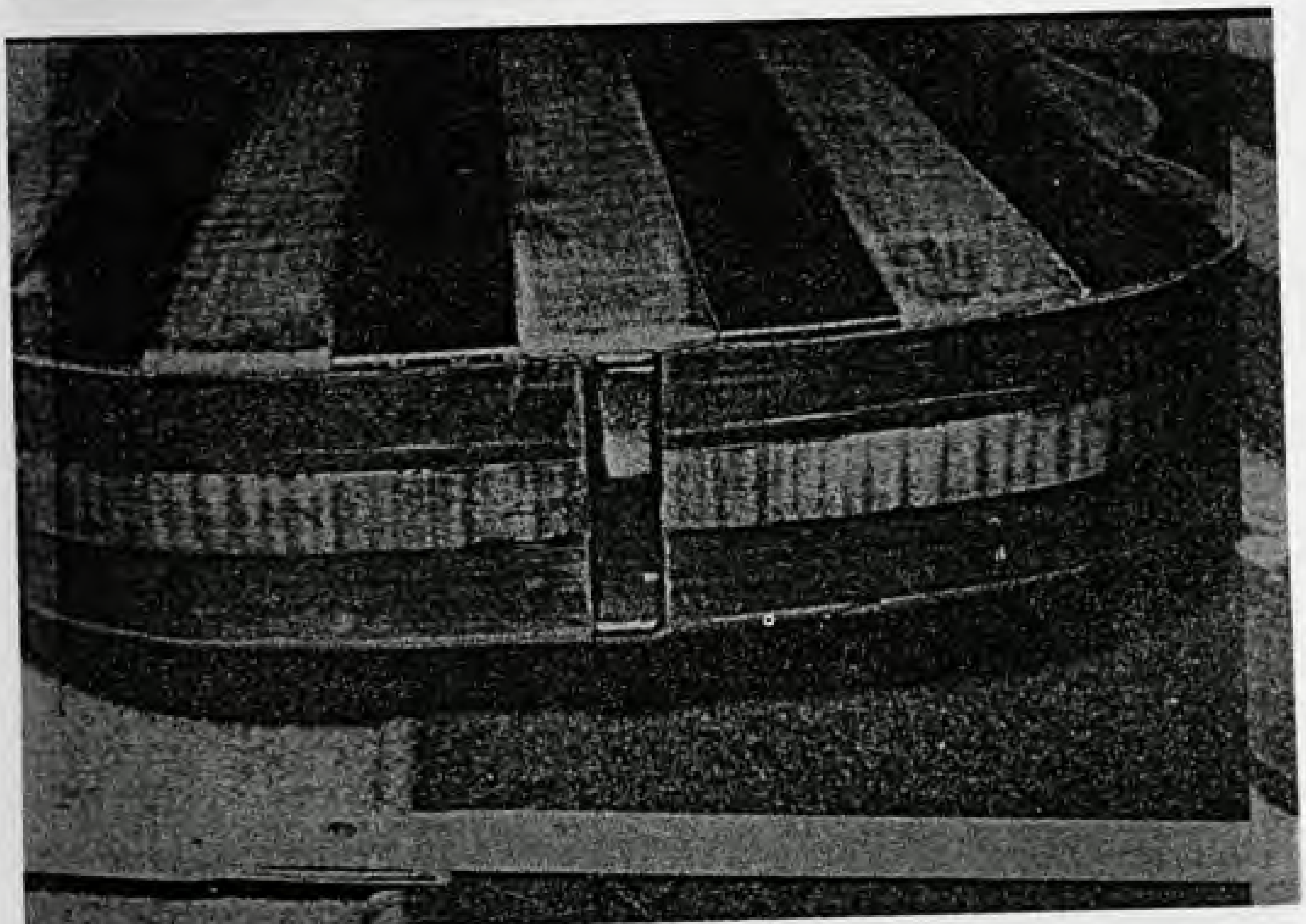
In spite of these reservations, this is a very interesting instrument, and it will be a challenging problem to find its place in instrument history.

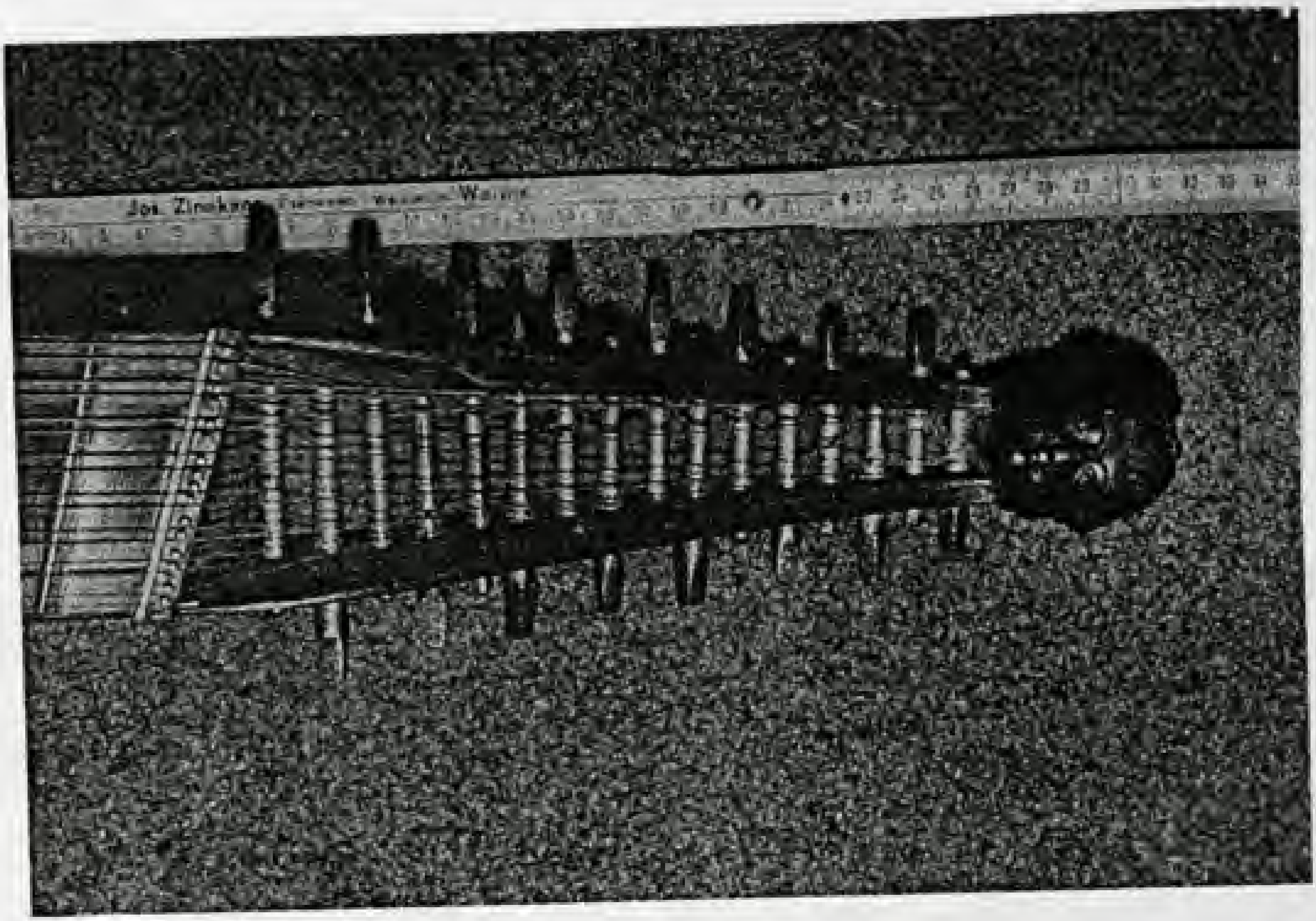
Prime candidates are that it was made in England early in the 17th century, or in Germany in the English style, either at that time or considerably later by one of Tielke's school of makers. At the earlier time it could have been the orpharion version of a treble lute in d" at a semitone-low pitch standard, or in a′ at a third-high pitch standard. At the later time it could have imitated an ordinary lute (whichever relative and nominal tuning it had), or it could have performed some other function (such as an expanded bell cittern or mandora).

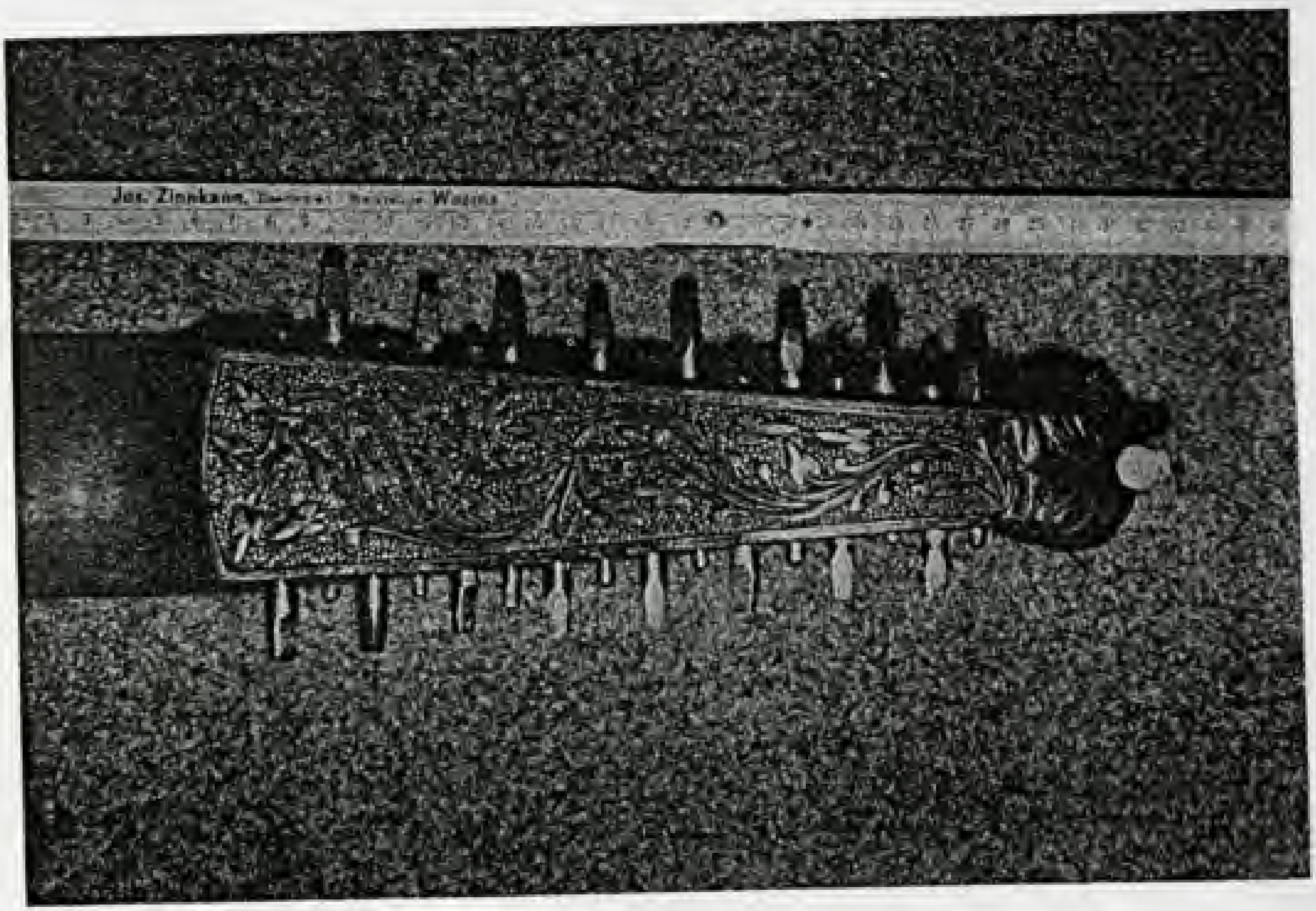












MORE MID-16TH CENTURY SPANISH INFORMATION ON GRACING

Ephraim Segerman

Diana Poulton has sent me translations of two more Spanish statements on graces from the 1550's. One of these has reminded me of a serious omission in Comm 398 and the other, though pointing to another omission, does not pose as serious a threat to my thesis as may initially appear.

On f.60(v) Bermudo (1555) wrote that "some people make redobles to/involving the note above and not to/involving the one below", adding that both can add grace to the music. Miss Poulton was hesitant about interpreting this statement, pointing out the ambiguity of "to" and "involving" as translations of "a" in the Spanish. It is clear to me though that Bermudo was writing about graces and their auxilliaries. The question is to determine which graces were being discussed. In trying to make sense of this statement, it is best to compare it with those on this topic by his two countrymen writing at the same time, Sancta Maria and Henestrosa.

Bermudo used only the term 'redoble', Henestrosa only the term 'quiebro' and Sancta Maria both, (writing that both terms basically mean the doubling or repeating of a note). Sancta Maria went on to define the redoble as a type of prepared shake (shake with introductory notes) and the quiebro as a class of graces including the unprepared shake plus shorter graces. Neither Bermudo nor Henestrosa considered graces in the detail that Sancta Maria did, and so it is unlikely that they distinguished between an unprepared and prepared shake in their discussions. Following the spirit of Sancta Maria's usage, Henestrosa's quiebros probably included shorter graces than shakes and Bermudo's redobles perhaps did not. On these assumptions, Henestrosa's statement includes shakes, both kinds of mordents and the repeated lower mordent (I am not seriously considering the vibrato possibility), while Bermudo was comparing the shake with the repeated lower mordent.

A consistent story of the 1550's grace situation in Spain now emerges. Henestrosa wrote generally about the important graces used without involving himself with minor exceptions like the new turn. Sancta Maria wrote more comprehensively about the graces used, but of course left out the repeated lower mordent which he considered was unmusical. Bermudo criticized those such as Sancta Maria for such a judgement.

I know of no earlier reference to the repeated lower mordent than that of Bermudo. Ammerbach (Tablature (1571) Leipzig) illustrated it. Preatorius (Syntagma Musicum III (1619) Wolfenbuttel p.235) compared the shake ("Tremulus Ascendens") with the repeated lower mordent ("Tremulus Descendens"), commenting that the latter "ist nicht so gut" as the former. His position was somewhat inbetween that of Bermudo and Sancta Maria.

The repeated lower mordent seems not to be included in the Capirola book, though there is no evidence that it was new in Bermudo's time. It seems reasonable to suspect that between the second and sixth decades of the 16th century the grace situation became symmetrized, with the addition of the upper mordent, an unshaked version of the old (starting on the main note) shake , and a shaked version of the lower mordent.

The table on p.59 of Comm 398 should include the repeated lower mordent. It is a very useful addition to the relishes for c.1600 English lute music. It was called "the Beate" by Mace in 1676. The grace table entry of "to beat down the finger with a shake" in the Board Book probably primarily refers to a choice between this grace and the short shake.

Miss Poulton also pointed out an omission in her L.S.J. translation of Sancta Maria's comments on graces. When Sancta Maria stated that there were four types of simple trills on crotchets and the translation separately described the lower and upper mordent, each with the auxilliary a semitone and then a tone away from the main note, I took these as the four in Comm 398. But the missing statement that follows shows this to be wrong. In Poulton's translation, Sancta Maria then wrote "but the two others are made of two notes only, thus fa mi on the ascending and fa sol on descending passages".

Since no example is given in notation, this statement is ambiguous as to which is the main note and which is the auxilliary. If the first in each (the 'fa') is the main note, then these graces are just the appropriate mordents for these passages, but with the final note of each omitted. Alternatively, the main note would be the second, in which case, these are both of the appoggiaturas.

If the latter were the case, this would seem to wreck havoc with the historical basis for my association of the 'relish' in the English repertoire with all of the old graces starting on the main note or upper auxilliary used since the middle of the 16th century, and of the 'fall' with the new types of graces starting with the lower auxilliary. Sancta Maria's statement would show the new type to be as old as the old type. My theory (if it can be called a theory) is saved though by noticing that Sancta Maria's use of appoggiaturas is contrary to that by everyone else, and so it represents a false start or cul-de-sac in the development of these graces in Spain then.

From Borrono to at least CPE Bach, the main functions of appoggiaturas in molodic movement of seconds and thirds has been to smoothly link the melody together. Thus the auxilliary is usually in the same direction from the main note as that from which the previous note came. Looked at from another point of view, the auxilliary note in appoggiaturas (and most other graces for that matter) usually avoids anticipating the following note in mostly scalewise melodic motion. Sancta Maria's use of appoggiaturas does just the opposite, anticipating the following note. We find no evidence of the systematic pursuit of this practice after him, so if it existed, it must have died out. Meanwhile, the melodic linking approach used by Borrono for the upper appoggiatura was sucessful and eventually was joined by the lower appoggiatura in faster scalewise motion, with fancier falls (e.g. repeated fall, double appoggiatura from below and double appoggiatura from below plus repeated fall) developed for longer notes.

More information on Renaissance gracing practices is around that I have not yet looked into. These can seriously modify my chronology of grace development if they stand up to close scrutiny. For instance, on p.534 of Reese's "Music in the Renaissance" is the statement that when comparing the keyboard transcriptions in Antico's print of 1517 with the vocal frottole originals one finds "mordents, inverted mordents, turns, trills and trills-plus-turns". I haven't looked at Antico's book. Anyone wanting to have a go at shooting me down could readily start with this source.

Those of us who are interested in reproducing early music in the way that the composeres expected to hear it need to do more than just providing authentic sounding instruments and accessories and using music editions which are competently edited. The performing style has to be authentic too, and gracing is an essential aspect of performance style. In this sense, practically all modern performances and recordings of Renaissance music are defective. When the dust has settled some on this issue, I look forward to performers taking this next step in pursuing historical accuracy.

FoMRHI Comm. 409

RENAISSANCE AND BAROQUE BOWS: GENERAL CHARACTERISTICS AND DEVELOPMENT

Ephraim Segerman

We at NRI now have a very promising bow-making trainee, Ken Cameron. He is coming along so fast, making better and more authentic bows than we've ever offered before, that I felt a new bows brochure had to be written. As usual, I started by writing about the historical and other factors that effect choice. This first draft is turning out to be much more of FoMRHI Comm than anything that could be considered commercial. It is not finished, but since this is a thin issue, I thought it might be of interest to include what I've written. As usual, I welcome any comments (constructive or otherwise).

Basic Design

In Medieval times, if there was some means to keep the hair away from the stick at the held end (which was rare), it was a fork in the branch the bow was made from. As the Renaissance developed late in the 15th century and early in the 16th, rather straight bows with separate frogs became more and more standard. The fixing of both ends of the hair onto the stick was usually invisible, and probably was by wedge as with modern bows. The frog was held in place by the tension in the hair and a recessed flat on the stick. The presence of the frog maintained the bow-hair tension. The thickening of the stick to form the head was rarely much greater than the mimimum needed to provide adequate walls for the well that receives the blob at the end of the hair and the wedge.

This basic bow design was used throughout the 16th and 17th centuries and most of the 18th. There are many still-life pictures from this period showing instruments with bows. The instruments sometimes show broken strings, even occasionally a dropped bridge, but the bows are never shown with the frog taken out. To us this implies that, contrary to modern practice (where bow-hair tension is released when the bow is not used) the bow hair then was continuously at full tension.

Origins of the Screw

During the Renaissance, screws were used for various purposed such as attaching pieces to cast statues and attaching tailpieces to viols. The threads on these were hand-filed. The principle of the screw-cutting lathe was first recorded by Leonardo da Vinci in the 15th century. As sketched by him, it would probably have proved too light even for cutting screws in wood. In the 16th and 17th centuries a few large crude screw-cutting lathes were made, used mainly for making ornamental wooden objects. After 1650 metal screws were made for microscopes and measuring instruments. To make these, a high level of craftsmanship was required in handling the cutting tool on the mandrel lathe. Only by the very end of the 18th century did the engineering industry have practical screw cutting lathes at its disposal. But the clock industry preceeded it by half a century. Before 1750, Antoine Thiout incorporated a tool holder into a small lathe for cutting screw threads on spindles of clocks and watches. This was probably the first use of a screw drive for operating the tool of a precision machine. The making of such screws could now be routine and thus cheap, rather than an expensive feat of craftsmanship. We presume that it then became economically feasible to include screws in the making of musical instruments and accessories.

In the 1750's a screw turning mechanism operated by a watch key started to appear on English guitars. The first clear evidence for screws used on bows is a mention in the first volume of l'Encyclopedie which appeared in 1751. A 1765 English advertizement implies that fixed-frog bows were still then considered standard and bows "with screws" were listed afterwards.

A Possible Transitional Design

Some histories of the bow date the introduction of the screw to late in the 17th century, citing one with a screw bearing a date of 1694 on the frog. One can raise many questions as to why and when the date mark appeared because this bow does not display the apparent opulence that the expense of incorporating a screw at that time would be consistent with. But a more constructive historical view would be to consider that perhaps a new type of fixed-frog bow design was then being experimented with. In normal fixed-frog bows the pull of the hair at the frog-end fixing is perpendicular to the stick, a rather more exacting test of the quality of the fixing than that at the tip end where the pull is parallel to the stick. If the hair is fixed to the frog instead, the pull would be parallel to the stick at both ends. The frog would then need somehow to be attached to the stick. This could be done by a pin sticking into a hole drilled down the end of the stick which engages an eye attached to the frog entering the bottom of the stick through a slot. This is the same as the modern system except that the pin and eye are smooth rather than threaded, and the slot in the bottom of the stick is just big enough for the eye. Perhaps this design had the added advantage, with a somewhat longer slot, of using spacers to adjust hair tension after hairing, reducing the accuracy required in cutting the hair length. The conversion of such a bow to screw action is obviously trivial, with no evidence of the original state remaining. No self-respecting bow rehairer in the 19th or 20th century would be able to resist making such a conversion.

It is often claimed that the cremaillere system of varying frog postion (by shifting a metal ring attached to the frog along a serrated edge on the top of the bow) was a late 17th century transitional design between the fixed-frog and screw types. I can find no evidence for the use of this bow by musicians who played serious (i.e. notated) music, and suggest (with equal lack of evidence) that this type of bow could have been a folk imitation of the screwed-frog bow.

Wood for Bow Sticks

According to the O.E.D., a source in 1541 mentions bows of ash, elm, wych (a superior type of elm) and hazel. Another source in 1544 gives the same list but substitutes brazil for hazel ('brasell' for 'hasyll'). A 1553 source (citing Darnasseri, almost 200 leagues from Calcutta, as the source) spells brasil as 'brasyll', so an error somewhere in transcription is a decided possibility. Hazel is a contender since it has historically been an alternative to cane for fishing rods, and cane is thought of as one possible medieval bow wood. The name 'brazil' then probably referred to Caesalpinia Sappan from East India. It was mentioned by Chaucer as the source of a red dye for cloth. This was the main reason for its importation. It is very closely related to Caesalpinia Echinata which is the standard wood (pernambuco) for making bows today. The Echinata species of the genus is from the South American country named after this wood. Though the above 16th century lists of woods may possibly refer to archery bows rather than musical bows, this is argued against by the omission of yew which contemporary references claim was the best wood for this purpose.

Various 16th and 17th century inventories of musical instruments mention bows made of Indian wood. This probably was brazil. Rousseau's (1687) statement of Chinese origin of the best bow wood could well be the same, perhaps a conclusion derived from a misunderstanding of East India as east of India. Trichet (1640) listed brazil and ebony as bow woods. Ebony was used on some well-respected 19th century bows used today, but it is now avoided, perhaps because it accelerates corrosion of iron screws. Talbot (c. 1690) specified speckled wood for the violin bow. This probably was snakewood (Piratinera spp., though Retford claims it is another species in the same family, Brosimum Aubleti). Snakewood was used on many bows till large-headed bows replaced the earlier small-headed variety late in the 18th century, when brazil became standard again.

These changes might have been related. Snakewood is denser than brazil so it would be the choice of those who wanted heavier bows. If two bows have identical dimensions and materials except for one stick being of brazil and the other of snakewood, the snakewood one, besides being heavier, would have its centre of gravity further toward the tip. The taste for such a weight distribution grew in the 18th century, and when executed in brazil, led to larger bow heads than were ever used before. This tendency continued and only stopped with the modern Tourte-type bow.

Since the 19th century, beech has been used on some bows for double basses and as a cheap substitute for brazil on smaller bows.

Hair Tension in Fixed Frog Bows

Modern bow technique involves setting the hair tension for a particular amount of bounce of the bow which is exploited for fast clean articulation. Bow weight and string tension are factors that influence this setting. If the hair tension were set to this optimum value in a fixed frog bow by the maker, it wouldn't remain fixed at that tension because of the effects on the stick and hair of time (in the long term) and humidity variations (in the short term).

Because hair tension could not be controlled enough to be exploited by such a bowing technique, this technique was probably not used and the hair tension was probably outside the range where it could affect and interfere with articulation by a different method. The rather flat bridge geometry which can be observed on many paintings of the period argues for a bow hair tension rather greater than that at which modern bows are usually set. Lower hair tension makes a hair angle at the bowed string which, combined with the depression of the string by the bow pressure (plus perhaps being fingered in a high position), makes bowing an individual string on a rather flat bridge quite hazardous. With the hair tension high, fixed-frog bows would have been considered as rigid sticks providing direct communication between the player and the string without interposing its own elastic properties onto this relationship.

Stick Durability in Fixed-Frog Bows

Any piece of wood under continual bending stress for a long time will take a set, and a fixed-frog bow will gradually lose its high hair tension. The skill of the bow maker in choice of wood and thicknessing can make sure that the hair tension is high enough for a long enough time. We believe that three years is adequate since it is time for rehairing anyway. During the rehairing, the stick can be heat-bent back to its original shape and be good for another three years. A modern moveable-frog bow also often warps with time (not just the cheap ones) and it is normal practice during its rehairing to heat-bend it back to its proper shape. The evaluation of any bow's straightness is a measure of the bending skill of the last rehairer and not of the bow's quality. Poor bow-stick quality is reflected in its not being able to take the required tension, or losing that tension too quickly, or unavoidably taking an unaesthetic shape when tensioned.

The Hair

In the 17th century the preferred hair colour on bows for small instruments seems to have been white, as it is today. Talbot (c.1690), when stating this preference for the violin, added that hair from a stoned horse is best. Rousseau (1687), while preferring white for the treble viol, added that black was best for bass viols.

As for the number of hairs in a violin bow, Mersenne (1635) specified 80 to 100 hairs. The modern bow has 150 hairs (Retford) but can be as high as 200 (Heron-Allen). Most of this increase of 50 to 100% must have occured late in the 18th century and early in the 19th when concern for projection in the newly fashionable concert halls seems to have driven violinist into very heavy stringing and heavier Tourte-type bows.

In early times as now, the bow was held at an angle so that the width of hair (and the number of hairs) in contact with the string varies directly with bow pressure. The narrow width when the bow first touches the string helps the note get started with minimum extra noise. Then, with low bow pressure this width remains narrow, giving a richer harmonic content in soft playing. But with high bow pressure, this width is greater, and by limiting higher harmonic content, suppresses shrillness in loud playing. The primary reason for putting more hair in the Tourte-type of bow was most probably to extend this latter effect in very loud playing. The lower hair tension allows this to happen with a less tiring bow pressure. (Loudness mainly depends on bow speed, with bow pressure only needing to be within a range for the string to sound; the maximum and minimum and total leeway in this bow-pressure range increases with increasing bow speed.) With the high hair tension of the lighter earlier fixed-frog bow, any more than perhaps about 100 hairs is never in contact with the string, and any excess just adds unnecessary stress on the stick.

General Relationship Between Length and Weight With Use

The length of hair used in a bow stroke is the product of the bow speed (which is directly related to loudness) multiplied by the time of the note (or notes) played in one stroke. So the longest loudest notes dictate minimum bow length. If the style of playing involves dividing all long notes, this length can be quite short. If the instrument's function is mainly harmonic where long notes are played unadorned, or if in the style long notes are graced instead of divided, a rather longer bow is indicated.

The bow pressure on a string is a combination of the effect of the bow's weight plus an additional force exerted by the player's wrist. The player's part of this is unavoidable, but using a heavier bow can reduce the effort in playing. But if one is playing fast passage work, the inertia of a heavier bow requires more force to change its direction of motion, and so effort is increased. With the same bow speed, the minimum and maximum bow pressure is less at lower tension and thinner strings and greater at higher tension and thicker strings. So if the overall tension level of an instrument is increased, a heavier bow is indicated, and ideally a lighter bow would be appropriate for playing on the treble strings of an instrument and a heavier bow in the bass. To get the note securely started, all-gut bass strings require a heavier bow than metal-wound basses.

It is obvious that, in the light of the above factors, the choice of a bow's length and weight is necessarily a compromise.

The point made here is that this compromise could well be different for playing different repertoires on the same instrument and for playing the same repertoire on the same type of instrument but with different stringing.

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HIZLER'S TENOR VIOLIN E. Segerman

Paul Denley (Finwood, Victoria Road, Bishop Walton, Southampton SO3 1DJ) has kindly sent me an extract on instrument tunings from D. Hizler's book titled "Newe Musica" (1628) Tubingen. The tunings are given as breves on musical staves with C- or F- clefs. They are:

Discant Geigen: e" a' d' g
Bass Geigen (4 string): g c F C
Bass Geigen (5 string): g d A E C
Bass Geigen (6 string): c' g d B F C
or: d' a e c G D
Alt Geigen: a' d' g c
Tenor Geigen: d' g c F
The relationship of the two 6-string bass tunings with that of the viol is mentioned.

This is the only direct evidence I know of for association of the name 'tenor' with the above tuning. Praetorius (1619) lists this as one of the tunings for a bass. Banchieri (1609) lists a tuning a tone higher as a bass. In these scources (and all others I know of except Hizler) the name 'tenor' is associated with Hizler's 'alt' tuning a fifth higher (the 4th string of Banchieri's tenor is a tone higher yet, a d).

It is unlikely that Hizler's tuning was for a tenor viola with about 40cm string stop (such as the examples in the Ashmolean). Without overspun strings (available only from the 1660's onwards), the open-string range of an instrument with this stop would be from G to c' (see Comm 162). An extra tone of range at the bottom would be possible with a much larger instrument, and it appears on lutes with the reenforcement of an octave string. But it is highly unlikely that an all-gut F on such a viola would sound acceptably.

The obvious alternative is one of the Italian basses of about 60cm (24 inches) stop performing a low-tenor function. It was probably often used that way in Italy, with the true bass of the bowed-string ensemble being the violone. If the Italian bass is Hizler's tenor geige, it is the first clear evidence for this usage outside of Italy. In 1636 Mersenne, who reported that modern viola tuning (Hizler's 'alt') was used on all three middle sizes of violin (between treble and bass), suggested that the largest of these should be twice the size of the treble and tuned an octave lower. The rest of this story is on p.83 of FoMRHI Quarterly 23 and the NRI booklet "Baroque Violins, Violas and Cellos". Both of these need slight modification to take this Hizler information into account.

ON MEMLING'S PSALTERY

Ephraim Segerman

When Comm 203 (Quarterly 15) by Kottick appeared, I found it quite entertaining, but didn't think about it seriously. Recently Brian Lemin wrote, asking for my opinions about the stringing and construction of this instrument. My suggestions may be of interest to others, so it follows:

From the picture (Plate VIII in Jeremy's 'Medieval and Renaissance' book) I measure the difference in vibrating string length (stop) between the shortest and longest strings to be 25 semitone steps on a monochord. The useful range of silver strings (from our string calculator - see Comm 162) on the same stop is 16 semitones. Therefore, the maximum range of the instrument is about 41 semitones or 3 octaves and a fourth. The nominal pitches of this range would probably then have been called G to c". This seems eminently reasonable. The actual pitches (according to modern standard) would be just an octave higher.

There are 61 strings that go across the instrument's width and 22 octave strings for the bass which Kottick reports go to tuning pins in the soundboard. I propose that there were 25 diatonic courses made up of 11 quartets in the bass (each course having two lower and two octave strings), 11 triplet unison courses, and 3 unison doubled highest-pitch courses on the very bottom of the instrument.

If chromatic notes as well as non-chromatic notes were required in the music, I would suggest that the relevant courses could have been split between the normal and chromatic notes (2 and 2 for the quartets, 2 and 1 for the triplets, and 1 and 1 for the pairs). This is a direct alternative interpretation of the labelling of the strings in Berkeley MS 744 that Christopher Page could not take seriously enough to mention (see G.S.J. XXXIII (1980) p.32).

The strings are about 4 1/2 mm apart in the treble, and the octave strings in the bass are about 2 1/2 mm away from the low bass strings on each side. These string spacings are close indeed, but not unreasonable if we assume that playing was with a plectrum, quill or a long fingernail. Since plucking location was only by positional sense of the hands, using no visual or pre-plucking touch cues, there may have been little advantage in grouping strings into courses. A possible advantage of the alternative (with the strings evenly spaced as Memling painted them) could be to offer the player more respect (and cash) for his accomplishment. A novice (such as a musically inclined employer), when handling the instrument, would initially find it more difficult to play tunes.

Psalteries from before the 15th century probably conformed to the general instrument-making practices of that time which usually involved a construction philosophy that did not rely on glue to hold instruments together. So psaltery backs then probably were either integral with the sides (carved out of one piece) or possibly nailed on. The soundboard would probably either be slid into shallow slots cut into the sides or it rested in a rabbet cut from the sides. In the latter case there would be a separate piece of wood (often shown in different colour) which follows right next to the side and which holds the soundboard down into the rabbet by pressure of the strings. This piece of wood could also perform the true function of a bridge if it extends further on top of the soundboard than the rabbet does below. Acoustically, the difference between a psaltery with or without a bridge seems to me to be that a bridge directly transmits displacement forces of string vibration to the soundboard, while in all psalteries (with or without bridges) the oscillation in string tension during vibration makes the sides tilt in and out which induces the movement of the soundboard (and back). Since string tension varies at double the frequency of string vibration, the most obvious difference in sound would be that the fundamental note of string vibration would be present in an instrument with bridges and absent in one without bridges. This is a difference in timbre of the notes, and need not be associated with any difference in overall loudness or richness of sound.

From the small-scale printed reproduction of the Memling painting I have available to see, I notice no evidence of the side being split into a true side and a bridge. Since the painting is from late in the 15th century, I would not be certain of how much of the earlier instrument-making traditions would still have been followed. Yet I would still not glue the soundboard onto the sides. It would be a great advantage to be able to detune the strings and slip the soundboard in and out for experiments in varying soundboard barring to optimize sound. To do this the strings need to be detuned and the upper section of the straight top side needs to be slipped out.

As for soundboard barring, I would (of course) have these attracted to rose edges (see Comm 136). If the sides and back are themselves not strong enough to sustain the string tension, perhaps bars across the soundboard parallel to the strings might be needed to avoid collapse. But greater resonance would result from bars going up and down the soundboard. The arc of tuning pins for octave strings in the Memling painting, if extended down to the treble end of the instrument at about 1/3 to the way across, presents a good bar shape and placement. A symmetrically similar bar on the other side would seem to be appropriate. In the pre-glueing days, such bars could either have been carved into the soundboard during its preparation, or separate pieces set into slots into the sides at the top and bottom (rather like bars in carved citterns).

These suggestions are only the result of armchair instrument making since I have not built such an instrument. Nevertheless I am not worried about my advice leading to a dud instrument. Almost any design of such a wire-strung instrument would sound well if given stringing that is appropriate to it rather than following inappropriate preconcieved ideas.

PROPOSED CONSTRUCTION OF A MEDIEVAL FIDDLE

E.Segerman and D.Segerman

Brian Lemin also asked about our promised design for a medieval fiddle that is simpler to make and more authentic than the one by Brian Tolley that we criticised (and were given hell for so doing). We never got around to making it, though one of us (Djilda) made two lyre da braccio mostly by this method.

The procedure is as follows:

1. Copy the instrument outline (pegdisc, neck and body) from any painting onto a flat board of soft hardwood (perhaps lime) of from 1"(inch) to 1 1/2" thickness.

2. Saw out the outline with a bow saw or bandsaw.

3. Either scoop out body cavity (a drillpress with a stop is a quick modern way) leaving an integral back, or saw out body inside and attach a flat back with glue and nails. The sides and back are about 1/4" thick with the sides perhaps thicker at the bottom where a tailpin can be inserted (a body projection at the bottom that the tailgut can hook onto is a possible alternative).

4. Scoop out back of pegdisc leaving about 1/2" thickness for the pegdisc and a 1/4" thick rim. The pegs will come in from the front and the rim protects them from being pushed out (and the strings detuned) when the instrument is dropped on its back. (A separate sawed-out rim glued and nailed on is possible).

5. Shape back of neck.

6. Use body as template and mark outline of soundboard on 1/8" flat sheet of quarter-cut spruce. Mark in soundholes and lines across the soundboard just above and below the soundholes for location of cross-bars. Outside the outline along the grain, mark out the two cross bars of full edge-to-edge length and 3/8" wide (this is the maximum depth).

7. Cut out bars, soundholes and soundboard (allowing a little extra width on the outline for the arched bending).

8. Transfer bar positions from soundboard to sides; cut slots into the sides 1/8" wide and 1/4" deep for the bars.

9. Round off top of each bar from 3/8" height in the centre to 1/4" height at the edges. Glue into slots in the sides.

10. Shape top edges of sides to give perhaps 1/16" of decent glueing surface to the soundboard as bent by the bars; glue soundbourd onto bars and sides, nailing it onto the sides.

11. Make the bridge (its width is seen in the original painting, at least from the spread of the strings, and its height is about the same as its width). The radius of curvature of the top of

the bridge is approximately equal to the body width. The particulars of bridge wood, shape and thickness will be determined experimentally after instrument is finished - this is just the first test bridge.

12. Make tailpiece out of leather. If no bridge is visible in the painting, it is underneath the front end of the tailpiece, in which case locate the tailpiece string holes far enough from the front edge for the string knots not to touch the bridge.

13. Make tapered holes at bottom for tailpin, in the face of the pegdisc for pegs, and in the side of the pegdisc rim for the bourdon peg (if there is one). The original method could easily have been by burning with a tapered poker. There are innumerable modern methods.

14. Drill small holes in neck end of pegdisc to guide strings from front to back of pegdisc, and a hole through pegdisc rim for entry of the bourdon string. Open up the ends of the holes to avoid making the strings go over sharp corners.

15. Whittle T-shaped tuning pegs and round tail and bourdon pegs to fit into tapered holes. Leave plenty of exposed peg shaft length in the back of the pegdisc. A medium-hard hardwood such as fruitwood would be appropriate for pegs and the fingerboard. Saw slots in ends of tuning pegs for string attachment and end of bourdon peg for string guidance. Round saw cut on back end of bourdon peg to avoid a sharp corner for that string.

16. Partially string up to determine fingerboard thickness and taper for reasonable action. Make flat fingerboard shaping the pegdisc end to serve the function of a nut (i.e. have a reasonably definite take-off point for the strings while avoiding sharp corners). When satisfied, remove strings and pegs and glue and nail fingerboard to neck.

17. Smooth and finish instrument surface.

18. Assemble and optimize bridge parameters.

The typical picture of a medieval fiddle shows five strings and the full width of an oval instrument where it is being bowed. If such an instrument was chosen for the above construction one will find that most players will say that it is unplayable. That is because they expect it to play like a violin, and there just cannot be anything like a violin's string-clearance bowing angle on such an instrument without extensive violinistic modification of design. So if you want both to make a proper medieval bowed instrument and still have it played, pick a very narrow fiddle (see Wright, G.S.J. XXXII (1979) - these fiddles may well have been mostly for plucking anyway) or a rebec, and stick with three strings. But if you have a folk fiddler wanting to have a go, you have a chance with a real typical medieval fiddle.

NEW DEVELOPMENTS IN MAKING THICK ALL-GUT BASS STRINGS

Djilda and Ephraim Segerman

When Djilda started to do research and development on historical musical strings, she recruited Eph into a partnership to try to solve the big mystery of historical stringing: It was clear to all that Renaissance and early baroque musicians used thick all-gut bass strings, but when such strings (available for the harp) were tried on lutes or viols, they produced hardly any sound. The historical evidence was very clear. Was the problem with modern ears or modern gut? Though defects in the expectations of our ears might still be relevant, Djilda and I, as physicists, identified a problem in the lack of flexibility of modern gut strings.

We looked into the history of open-string ranges of fingerboard instruments and identified two half-octave expansions of range that might be associated with changes in string flexibility which could have resulted from improved technology. The historical assumption was that opportunties offered by technological innovations are exploited by musicians to expand musical scope within an essentially unchanging set of criteria of aesthetic acceptibility.

The way to make a more flexible gut string is to increase the twist in the fibres. We associated the first range expansion with the introduction of strings in which care was taken to put maximum twist into the gut when made wet, and to keep adding twist as the string shrinks while drying and can thus take more. A neat bit of physics theory showed that indeed one should expect a half-octave greater range with maximum-twist bass strings than with gut just having the normal twist needed to make it nice and round. It was gratifying to find that there was complete agreement between the historical information, the physical theory and the practical results when we made and tested such strings.

The next range expansion required imparting even more flexibility to the gut, which implies even more twist than the maximum a single gut string can take. The only way we could think of doing this, of putting twist on top of twist, is to make ropes. Again we did some theory, which indicated that a rope with maximum twist in each strand and maximum twist of the strands together would give the required half-octave range expansion. We found making such ropes was not so easy. We could keep adding to the twist of the strands into the rope as it dried and contracted, but not to the fibres in each strand.

The problem was eventually solved by finding a substance which softened the gut without swelling it, thus being able to put in all of the maximum twists without losing any on drying. We used traditional rope technology where, as the strands twist into the rope, one has to carefully restore the twist of the fibres in that length of each strand that is not yet part of the rope. Otherwise the flexibility in one part of the rope would be different from that in other parts and the string would become untrue on stretching. Then the softening substance had to be washed out so that the string would not afterwards untwist of its own accord. It was a complicated business and rather labour intensive. The resulting strings, when sold, became unfortunately rather expensive. We could not think of a simpler and therefore cheaper way of getting all of the maximum twists into the gut rope.

Our roped-gut thick bass strings, called 'catlines', have gained wide acceptance on all kinds of early bowed and plucked instruments, creating a revolution in the kind of bass sound expected when playing Renaissance and early baroque music.

Lutes have been amongst the slowest in adopting all-gut stringing. An important factor has been that lutes have so many bass strings, making the cost of buying a set from us as high as £80. This has provided a decided incentive for lute makers and players to seek cheaper alternatives.

They have had another incentive. Lute players have had to cope with the easthetic problem of a greater loss in resonance and brilliance than bowed-instrument players have had to contend with when converting to all-gut basses from the modern substitutes. There was then the hope that 'better' all-gut basses than those we offer could be made.

Several of these experimenters are friends of ours and have kept us in touch with what they have been doing. Amongst these, Klaus Jacobsen, the London lute maker and Gusta Goldschmidt, the Amsterdam lute Professor, have been particularly active in this respect.

The basic approach that these and other experimenters have been pursuing is as follows: The gut is first soaked in water for a few minutes, long enough to become flexible but not long enough to swell appreciably. The strands are then tied together at one end and attached to a stationary hook. The individual strands are either left as they were or each is given an initial twist, after which they are tied together at the other end. A hand drill is hooked onto this other end, the string is given its rope twist and then left to dry. A refinement used by Gusta and some of her continental friends is to insert a spacer next to the knot at each end before the final twisting with the hand drill. This keeps the strands apart at each end, forcing the twisting to start in the middle of the string and from there to spread to the ends.

This approach is much simpler than what we've been doing. We tried it years ago before starting to use rope technology (where the twist in each strand is carefully controlled while the overall rope is twisted). The first strings we made using rope technology were better than the few we made by this method. This method seemed obviously inferior since it appeared quite unlikely to result in uniform maximum twist all over each strand in the final rope. So we abandoned this method and proceeded to optimize the conditions for making strings using the rope-technology method. We did not try to optimize the conditions for making strings by this original simpler method.

In hindsight, this appears to have been a mistake.

Though the strings made by our friends using the simple method have varied considerably in quality, some have turned out to be remarkably good strings, as good as our 'standard production' strings, and in a few cases, marginally better. So much for our theory and trust in rope technology! It seems that in the short length of a lute string, the twist of the fibres in each strand is able to even itself out reasonable well over the whole length even though it is different at different stages of the twisting. And making the string is so much faster that special materials to keep the gut soft during the process are not necessary.

We are, of course, now experimenting with this simple fast method for making catlines. The spacers are a decided help. One has to soak the gut the right amount of time (depending on the temperature of the water), put just the right amount of twist into each strand and then twist the whole string the right amount while pulling it at the right tension. These parameters have to be optimized for each gut length, diameter and inherent hardness. In the not-distant future we shall complete these tests and start producing such strings for sale. Of course, the price relative to plain strings will come down.

Catlines made of two strands are more flexible and therefore can give a more resonant tone than our 'standard production' strings which are made of three strands. But the surface is more bumpy and less pleasant to play on. The optimum values of the above parameters are of course different for a different number of strands in the string.

When retwisting already-made gut strings, one can expect a number of hairs to form on the surface. We varnish each catline and then hand polish it. This not only eliminates the hairs, but by using the time honoured 'twang test' on large and small sections all over the string between polishing swipes, we raise the trueness of the string to meet proper musical standards. This is the only really skilled operation involved.

The do-it-yourself string maker can omit polishing to trueness and he may still find a considerable fraction of the strings he makes are good enough for his purposes. In general, we've found that the more resonant an instrument is, the more exacting the string trueness criteria have to be to get the best out of it. Of relevance to this, a leading British lute maker recently commented that he had been finding that building a lute to properly respond to gut stringing is quite a different proposition than building one for nylon stringing. Since gut stringing on lutes is so new (in the second half of the 20th century), this statement implies that it may take some time yet before the makers and players reach a consensus on relevant lute quality criteria.

As mentioned above, some of the experimenters entertained the hope of finding a dramatic increase in resonance of thick all-gut strings over the ones we have been producing. This hope has unfortunately not been fulfilled (and we doubt whether it ever will). But small improvements can be expected since all factors can so easily be controlled and optimized. We doubt whetehr their disappointment has been very great though, since the experience of carefully listening to this type of string has revealed its attractiveness. Their achievement of leading the way towards a simpler cheaper way of making such strings is to be greatly commended.

To us it is clear that without our systematic approach, authentic stringing would not have graced the early music movement of today. But it is also quite clear that this approach does not necessarily lead to all of the answers. Scientific models of real situations are bound to be oversimplifications. Though they usually help to solve problems, they can sometimes, as this situation demonstrates, lead one in a direction which misses a better solution. That is why it is so good for the world to have so many people around who have the courage to ignore the 'experts' and to go about doing things their own way. Every once in a while they come up with a real winner.

 Robin Irvine

All-nylon strung lutes - an "authentic" compromise?

Many twentieth-century lutenists face a decision that their counterparts in the 16th to 18th centuries never encountered: whether to string their instruments with gut, or nylon, or a mixture of the two. The aesthetic advantages of gut need no retelling to the converted; the marvellous contrast between the "bright" upper strings and the "dull" (but beautifully rich) lower strings, which changes step-by-step down through the courses, is one of the main sources of colour in this, the subtlest of instruments. The lute quite simply becomes a different instrument when strung with gut, and some time ago, Ian Harwood[1] made an impassioned plea for the preservation of the all-gut sound for fear that we lose it altogether. He has also pointed out[2] that going to great extremes to make authentic lutes and then to string them in unauthentic nylon is something of a waste of time and effort.

But gut is expensive, a matter of no small significance to the amateur pursuing his hobby, or even the professional with a number of instruments to keep strung at their best. The latter in particular frequently favours nylon because of its dependability. Modern audiences lack the patience of those of previous ages with respect to instrument tuning and, although we may have things to learn about tuning during performance[3], in the age of concerts and broadcasts the reliability of nylon is still a persuasive force. When I faced the decision of whether or not to change to gut (having fallen in love with its sound, but not its price or practicalities), I began instead a systematic investigation into just what are the differences between gut and nylon for each string, to see whether an acceptable compromise can be reached. The experiments were very simple and consisted of taking one lute (mine) and one player (myself) and stringing whichever strings I was comparing side by side, plucking each in turn to see exactly what the differences are. No doubt others have engaged in similar thoughts, and not all of what I say will be original, but the investigation had at least some semblance of scientific method, and as such may be of value.

In the three upper courses (I am considering only the Renaissance lute here, but some of the arguments should apply to earlier - or later - instruments), and especially in the treble string, plain nylon and low twist gut can be made to sound very similar. One of the main problems with nylon trebles is their great tensile strength, which enables modern lutenists to tune their instruments to pitches that simply would not have been possible in earlier times[4]. As the tension in the string affects the sound, lutenists should have an idea of approximately what thickness and tension of gut treble their instruments would have employed[5] and string them with nylon accordingly. If solid nylon and (low twist) gut trebles of the same diameter are strung to the same tension, then the difference in the sounds they make becomes quite small. The gut treble is a bit brighter[6], and the sound sustains a little longer than the nylon treble. Also, the rough surface of the gut gives a slight edge to the sound which nylon lacks. Rectified nylon has a rough edge, but is less like gut in sound[6], and besides, the rough surface smooths down in the plucking region after a few weeks of playing - as does the gut (if it lasts long enough!).

The differences between plain nylon and low twist gut are most noticeable in a small room. In a larger room (especially with a high ceiling) they are much less marked. It is relevant to add here that not only does the same string give a different sound as the tension varies, but also that there can be considerable variation between individual strings - NRI, for example, make two different types of treble with markedly contrasting sound textures. Greater still is the difference between the many varieties of lute, and an even larger gap separates the sound made by individual lutenists. All these differences would have been at least as great (or greater) in the 16th and 17th centuries, let alone differences due to changes during that time, so that there is really no such thing as an exactly "authentic" lute sound. When considering this wide range of possible textures it is perhaps a matter of personal taste how much the contrast in brightness between nylon and gut trebles matters.

This all assumes strings of the same diameter and tension. Given that restriction, nylon will sound about a tone higher than gut[7] but as it is likely that Renaissance instrumental pitch, at least in Elizabethan England, was a tone or so lower than modern a' = 440[8], this difference is not too much of a problem, and nylon can always be strung slightly thicker to reach authentic pitch. Similar arguments to those outlined above can be applied to the two mean courses; that is, solid nylon and low-twist gut retain their similar [illegible] of the strings increases, though gut becomes "duller" more quickly than nylon as the strings thicken, so that the contrast between courses is slightly greater with gut. It is, however, in the lower courses (counter-tenor downwards) that the real problems occur, for here the difference in sound betwe gut and nylon becomes much too large to be acceptable.

Nylon-strung lutes usually have wire-wound nylon floss for their lower courses. The degree to which classical guitar stringing has influenced (dominated) lute string is exemplified by the fourth course, which in many lutes is a masterpiece of modern engineering - a pair of visually beautiful, thin, wound strings which sound absolutel nothing whatsoever like gut. Furthermore, in this course they are redundant, as soli nylon makes a sound much closer to high twist gut - the true alternative - and there no reason why solid nylon should not be used. For example, on my 59 cm string-length lute which is strung at about 2.5 kg per string, a nylon string 0.8 mm in diameter is suitable (a classical guitar b string is about this thickness). At this low tension the thick nylon is beginning to lose its upper harmonics, so octave stringing is[9] appropriate for most Renaissance music (discussed further, below). The use of solid nylon can even be extended to the fifth course; I had on this course for many months g string from a (high tension) guitar set, which had a diameter of just over a millimeter. I had to string it at a low (approx. 2 kg) tension, but the result was a love "plunky" sound, a bit stodgier than the equivalent gut catline, but much nearer to it than the wound nylon equivalent. However, the lower courses must be thicker still, a a few experiments with tennis raquet nylon soon convinced me that solid nylon was reaching its limit.

What is needed for the lower courses is something else, a twentieth century equivalent of the gut catline, or at least, a modern equivalent that sounds close. I is possible to (and for quite a while I did) employ gut catlines on just the lowest (6th and 7th) courses with nylon on the rest, and this is probably the best compromis of nylon and gut; a more common compromise is to use gut upper strings and wound nylo lower strings which seems to me a lot of expenditure for little improvement in sound. However, any mixture of gut and nylon has its drawbacks, as the two materials respond in radically different ways to changes in environment, and although catlines are the most stable of gut strings, I found that even with only one or two of them my instrum did occasionally go out of tune in the middle of a piece of music. As mentioned abov many modern performers cannot accept this instability.

After a considerable search, and a lot of experiments, I have eventually found something which, although not yet perfect, goes a long way to solving the problem presented by the lower courses[10]. A gut catline is essentially a rope made of gut. Most artificial ropes or twines (rayon, nylon, etc.) are too light and flexible, so they do not sustain their vibration long enough when plucked. However, I have found that Barbour Threads Ltd., a specialist twine-making firm in the U.K., manufacture a range of nylon twines which are very tightly woven and have a density and flexibility similar to gut catlines of the same diameter. This firm also make the same range in terylene, and these are slightly denser so that they provide intermediate densities between the various nylon thicknesses. These twines have a rough surface (due to the fact that they are woven from much thinner fibres) which gives them a harsh sound on plucking; gut catlines do have a rough surface, but it does not sound so strongly, an it soon wears to a smooth finish. However, this disadvantage of twine can be overcom by coating it with Shellac[11] and then polishing it with castor (or some other natural oil; this gives it a surface more like gut (and, incidentally, a more gut-like brown colour which is preferable to the original rather asceptic white!). The important comparison, however, lies in the sound, and placed side by side with the equivalent g catline, the two sound very similar. The nylon/terylene twine is a little "drier" in tone, though this is minimized by plucking it a little way (5 cm or so) from the brid The duration and volume of sound is very similar to gut, and the projection, judged b other people's opinions, is identical.

The major difference, and drawback, is that polished twine is a little bit, but noticeably, "duller" than the equivalent gut catline, especially in the thickest twin I tried[12]. How much this matters depends on personal taste; for those used to the mu brighter sound of wire-wound nylon these twines would sound very dull at first, where players accustomed to an all-gut sound would not be perturbed at all. Nylon upper strings are a bit duller than their gut equivalent anyway (see above), so in fact th contrast between courses which gut produces is nicely preserved with nylon. It is important to remember that all this comparison has been done with modern gut catlines of whose properties, compared to those of earlier times, we cannot be certain. More importantly, I have found that octave [illegible] d twines enormously and is, to my ears, essential; certainly, it brings their sound much closer to gut catlines strung in unison. We know that octave stringing on lutes was common or universal for most of the 16th century. Lutenists who love the music of de Rippe, da Milano and Bakfark (and surely it is the contrapunctual imitative music of these composers which most demands a gut or gut-like contrast between the courses) should bear in mind that catlines did not appear, as far as we know, until the late 16th century; the gradual (but by no means complete) disappearance of octave stringing at this time may well have had something to do with the brighter sound of these catlines as compared with the thick, high-twist gut which had probably been employed before[13]. I cannot say that the twines I have tried are nearer to this early sound than modern gut catlines, because no-one really has any idea. All I can do is make a subjective judgement of the beauty of the sound my lute makes when strung with polished twine, and how it suits early 16th century music particularly well.

Amidst all this speculation I can state one unequivocal fact: polished nylon/terylene twine sounds very much closer to gut than wire-wound nylon floss does. Furthermore, it is very stable once stretched and changes with temperature in almost the same way as plain nylon. It also has a long life; with the aid of a little judicious touching up in the plucking region using a paint brush and a shellac solution, I can see no reason why the strings should not last indefinitely.

In conclusion, if we lived in an ideal world, everyone would string their lutes with gut because lutes sound so much more beautiful strung that way, and there will never be a substitute for the real thing. But we do not, and for those who wish (or are compelled) to opt for nylon strings, I think an acceptable compromise can be reached. By choosing treble and mean nylon strings of the correct thickness and tension, by using solid nylon on the fourth (or even fifth) course, and by employing polished nylon/terylene densely-woven twines on the lower courses it is possible to string a lute with all the advantages of cheapness, stability and long life offered by modern fibres, and very nearly all the aesthetic advantages of gut. The latter are obviously a matter of subjective opinion; I think my lute, when strung in this way, makes a wonderfully rich sound and I believe that anyone hearing it would be hard pressed to tell whether or not all-gut stringing was being employed. But these investigations are only preliminary, and I hope they may inspire others to improve on them - especially in the search for an alternative to wire-wound nylon floss[14] - so that in the end we may considerably increase the frequency at which we hear the lute, if not at its best, then very nearly so.

Notes

1. Ian Harwood (with the assistance of M. Prynne) A brief history of the lute Lute Society Booklet No. 1, 1975.
2. Ian Harwood "The Lute" in Making musical instruments (strings and keyboard) ed. Charles Ford. Faber & Faber, London 1977.
3. Ephraim & Djilda Segerman. All-gut stringing of lutes. NRI pamphlet, September 1981
4. Harwood. See Note 2 for reference.
5. Information on this has been obtained by Ephraim and Djilda Segerman, for example the reference in note 3, which summarizes their findings.
6. Abbott & Segerman (EM 4 pp430-437) have attributed the brightness of gut to its uneveness in thickness and density which produces more harmonic overtones, and so a less straightforward (plain) sound. This is substantiated by the fact that I have found that rectified nylon (nylon ground to an exact uniform thickness) has a duller and less gut-like sound than plain nylon. It seems that the uneveness of plain nylon serves it to advantage in this instance and narrows the gap between the two materials.
7. The frequency (ν) of vibration of a string length ℓ, density δ under stress τ is given by the equation $\nu = (1/2\ell)\sqrt{(\tau/\delta)}$. To put that in usable units, if ℓ = length in centimetres, t = tension in kilograms and w = weight per unit length (in milligrams per centimetre), $\nu = (15653/\ell)\sqrt{(t/w)}$ or $t = 4.08 \times 10^{-9}\nu^2\ell^2 w$. Solid nylon has a density about 1.14 gm/cm^3, approximately 20% less than that of gut (though gut's density varies with water content), hence the difference in pitch. The greater weight per unit length of a gut string of the same diameter as a nylon string, partly explains the longer duration of sound mentioned above; gut and nylon strings of the same weight per unit length sound even more similar than do those of the same diameter.
8. Abbott & Segerman; for a list of references see Harwood EM 9 470-481.
9. If the demands of octave stringing dictate a nylon filament thinner than the 0.4 mm commonly available, then fishing line can be used. It sounds fine in this context.

10. I am deeply indebted to Campbell Harper for his help in finding strings with the required characteristics.
11. This is a polish made from beetle wing cases. Polishing twine adds about 10% to the weight, and terylene twine ends up at a similar density to a gut catline and nylon about 10% less. It is important to apply the minimum polish necessary for a smooth surface; the less polish the brighter the sound. I apply the polish by hand (with a polythene bag over my fingers) as a very-runny-syrup consistency suspension in ethanol. Suggestions for alternative polishes (or means of application) would be welcome, as my methods are by no means optimal.
12. The thickest twines (necessary, for example, for a 10th course at authentic pitc on a Renaissance lute) are unusually dull, and though quite usable, are the leas satisfactory. Some of this fault may lie with my polishing technique (see note but it is mostly because the weaving is less dense at these greater thicknesses, and so even the polished terylene is thicker than the equivalent gut catline (cf. note 11). An even more densely woven twine may be required here (and, in addition, denser weaving would probably brighten up the sound of the thinner twi
13. The vihuela was, as far as we know, strung in unison pairs throughout the 16th century, but we know nothing of the strings that were used. Did the catline com originally from Spain?
14. Barbour Threads Ltd are a specialist firm who supply industry. There is, as yet no retail outlet (off the shelf, by the metre) for these particular very dense twines, as they are only made to order. (My source was free samples given to me Mr Harper). However, there may be other firms (unrevealed by my searches) in th U.K. who make twines with similar properties, and there must be many others elsewhere in the world (the U.S.A. especially), who not only may make dense (or dens twines, but may sell them in small quantities; the twines must have a density (as naked twine) about 85% or more of the equivalent gut catline (see note 11), for example 18-20 mg/cm for an unpolished twine 1.6 mm in diameter. I would be grat for any information about alternative sources (at 40 Dodford Lane, Girton, Cambri CB3 0QE, U.K.) Alternatively, some enterprising individual or string-making fir may wish to invest in the minimum order from Barbour Threads (who could, while t are at it, make a batch of twines even denser than those I tried, see note 12). can supply samples and details to anyone seriously interested. I also have a fe metres spare of about 15.3 mg/cm and 13.1 mg/cm (after polishing) which I could to lutenists (s.a.e. please) who would like to try them, especially in performanc

I like to add something to Jeramy's note (bull.25,p9) and Tim's Comm. (bull.25, p28). Differences in treatments of metals like brass affect the sound produced by that metal. Hammering a cymbal or making it in another way does make another sound. With the method, the technology you chose, you chose a possible affect on the ultimate sound. In short, different tools/technology (can) affect the sound. With metalwork it's obvious. With woodwork there's a difference, I think. While in metalwork the tool can *change* the structure of metal, in woodwork the tool, if you direct it that way, can only *make use of* the structure of wood but *cann't change* it (except making it worse). So, to me it's first the wood itself and then the use of it. Splitting, adzing, chiseling etc. is apt to follow the grain more easely. There is a difference in using a sander to shape the mouth of an organ pipe (I heard of one doing so), or using a perfectly honed japanese finish chisel. In choosing a certain tool/technology, you also choose a certain possibility to get the feel of wood. One fills and dulls his mind with speed, much noise etc., another gives himself or herself room for thinking, feeling, contemplating -and sees the wood working with. And only the last one can use even machines with sense. No doubt a certain attitude too, will affect the work accordenly.

Concerning a given wood two things affecting the sound are *woodstructure* and *drying-method*. Woodstructure can be kept more easily intact with one tool/technology or another, as said already. About a possible different quality between airdried and kilndried wood makes Krenov, a cabinetmaker whose attitude towards wood and woodworking I admire (not only because he's calling a plane "the cabinetmakers violin" and setting it "tuning the plane"), an interesting remark:"Somebody says: There shouldn't be any difference; not if the kiln works right, drying the wood slowly enough. But does the kiln work "right" in these time-is-money times?" By the way, do we laways know, if our wood is aidried or kilndried? The man who's selling? Anyway, Krenov, who's not a musical instrument maker, does believe there are differences: colour, texture, a different ring, a different sound ("even under our tools"), kilndried wood is more brittle. Also interesting is: (Krenov)"In a book on woodworking an English cabinetmaker says there is no essential difference between airdried wood and wood that has been dried in the kiln. I find such a statement rather sad. Not because it's untrue -but rather because it has become true for so many cabinetmakers".

Often I read/thought that old wood can be better then "new". In Jan van Heurn's "De Orgelmaaker"(Dordrecht 1804/5), where he's writing about making the windchest, we find another opinion, namely that that's not at all the case, and that it is brittle and even more works then new wood... Right? Wrong?

FoMRHI Comm. 416 Jeremy Montagu

Review of: Winfried Schrammek (text) and Sina & Volkmar Herre (photos), Museum Musicum, Peters, Leipzig, 1981. 25 East German Marks.

Twenty-five very attractive colour photographs of instruments in the Musikinstrument-Museum der Karl-Marx-Universität, Leipzig, plus 13 more instruments in colour on the front cover and a good many more in line (egravings, woodcuts, etc) on the back cover, inside front and back, and facing each colour plate throughout the book.

The text is a brief description of each instrument, locating it in musical and general history also, sometimes by quotation from writers contemporary with it and sometimes with new text. As usual in such books, the instruments are the prettiest and not necessarily the most important in the museum, and at least twice they have succumbed to the pictureque in preference to the informative (a pochette, very little of which is visible outside the pocket of a beautifully embroidered coat, and the Domenico Pisaurensis harpsichord of 1533, the only view of which is a close-up of the beautifully carved rose; very useful for those who are always looking for good pictures of roses, but frustrating for those who'd like to see the harpsichord).

The other instruments shown are the Antonius Brensius lira da gamba, 1592; Wenedelin Venere'Theorbe', 1613, "zugericht" by Sebastian Schelle 1723-26; an alto and tenor viol by Ernst Busch, 1640 &1644; the keyboard and the bottoms of the pipes only (another frustrating one) of a Roman positive, post 1500; a small table organ, a bit bigger than a portative, German, probably 17th c; the front of another positive (the 'prospect' rather than the whole front) dating from around 1635; the head only (a rather nice bird) of a violin by Dini, 1707; a Landsknechtstrommel (very deep side drum) with a pair of timpani sticks on it, both 17th c; a French earlyish 18th c serpent; sackbuts by Hieronymus Starck (alto, 1690), Hans Miler (tenor,1630), and Hans Hainlein (quint-bass, 1631); a cornett by J.W., c.1700; an Italian harpsichord, 2nd half 17th c; recorders by H (sopranino, c.1600), Haka (descant, c.1690), Oberlender and Heytz (treble, 1735 & 1730); oboe da caccia (wooden bell) by Weigel, c.1740; a pitch pipe c.1700; the works of a musical clock by Hain, 1812; a night watchman's horn (it looks as though it's reed blown), early 19th c, shown with what looks like a very modern child's toy ratchet rather than a watchman's; a small organ with its carrying staves in position, Italian mid-18th c; a small hurdy-gurdy by Levalois, 1753; a trompe (Parforcehorn), c.1860; a guitar by Thielemann, 1813 and a German mute guitar c.1830, both posed on Mendelssohn's sofa; a pedal harp by Renault & Chatelain, 1790; a violin by Audinot, 1880; a Hubert clavichord, c.1775; a workbox piano by Hlavizek, c.1800; a glass harmonica c.1830; the keyboard end of a piano by Peržina, c.1840; a flute all-but invisible as it's in pieces in its case by Wiesner, 1826 & 1828 (?); a very odd looking small harp (Schossharfe), pre-1800; and a Laurent glass flute, 1811.

All this plus the 13 instruments on the front cover (14 - I missed the ocarina), all of which are listed in the back of the book, makes this worth £5 or so of anybody's money. I wish all museums did this sort of picture book, with pictures of this quality, as well as their serious publications. I don't know who the local agents are outside East Germany, but it's worth asking anybody who stocks Peters Leipzig publications. I should have had the sense to show it to Tony Bingham and Brian Jordan, both of whom were up here last week, but if they read this, they may well get stocks. If not, write to the Museum, who are members, and see if they can send direct.