FOMRHI Quarterly

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FELLOWSHIP OF MAKERS AND RESEARCHERS OF HISTORICAL INSTRUMENTS
Hon. Sec.: J. Montagu, c/o Faculty of Music, St. Aldate's, Oxford OX1 1DB, U.K.
IT'S TIME TO RENEW YOUR SUBSCRIPTIONS. The rate is the same as last year and this year, and I hope we're going to be OK with it. The Post Office has 'rationalised' its rates, and it has done so by abolishing the cheapest of the overseas airmail rate bands (which doesn't affect many of you) and also by abolishing the special reduced rate for such printed matter as books, journals, and so forth, which affects all overseas surface mail. As these rates have only just been announced (one only gets the information in the week in which they take effect), we've not been able to make calculations in time to circulate the Fellows and so forth, so we're crossing our fingers and hoping for the best.

There will be an INVOICE with this Q (which makes it easier for some of you, and much easier for us when it comes back with your payment), but for those of you who lose it, the Rates are:

For UK and for all countries by surface mail: £ 8.50
to which should be added if appropriate:

Supplement for airmail to Europe £ 1.50 totalling £ 10.00
Supplement for airmail overseas £ 3.00 totalling £ 11.50
Supplement for payments not in £ sterling £ 3.00 (US $ 6.00 approx)

and the address to send it to, is: Barbara Stanley, Honorary Treasurer FoMRHI, 21 Broad Street, Clifton, Beds SG17 5RJ, UK.

We're happy with your own cheques if your country permits it; don't go spending money on bank drafts in sterling unless that's cheaper than the £3 supplement for foreign currencies. Eurocheques work. GIRO cheques work (our GIRO account number is 27 316 4406) (NB neither of these needs the foreign currency £3 supplement), but you MUST write your name legibly on the counterfoil or whatever comes with it. Each year we have one or two subscriptions without any identification, or with one we can't read, and of course whoever sent them never gets their Qs.

Barbara asks PLEASE don't send your subscription registered or recorded delivery unless this is essential at your end; if you do, the postman won't deliver it and she has to trek down to the post office to collect it.

If you can afford to add a bit for those who can't send money abroad, we and they will, as always, be grateful. I think that we should continue this scheme, though with all the changes in Eastern Europe, it should become easier for people to send money abroad. However, for the time being, hard currency will remain in short supply there, and anyway we are beginning to pick up members in other parts of the world with similar regulations (parts of South America, for example), and I think that we should go on making FoMRHI as widely available as possible. I am always glad to hear of more people who would like to receive FoMRHIQ in this way; if you know someone who would like to, send me the name and address. But make sure they really want it; we don't want to waste the Q or your money.
We have operated this scheme for many years abroad, but we have never said to people in the better off countries that we'd help them if they're broke. What do people think about this? Some of our original members are now retired; should they get a concession? What about students? We've never had a student rate; should we? One problem is that all such schemes are open to abuse. Much as I admire *The Galpin Society Journal* or *Early Music* or the equivalents, we can't afford to have people saying, "right, I can afford to join the Galpin [or whichever] because I can get FoMRHQP on the cheap". Anyway, think about it. If a number of you feel that there would be justification for it, we'll consider it. But my own view remains that we should help people who aren't allowed to help themselves, rather than those who could pay if they didn't buy one bottle of whisky this year.

And do, please, renew now. It does help us, to phase the paperwork over the next couple of months, and it helps you, too. If you forget till after the January Q has appeared, it can be a long wait till you get it, simply because none of the three of us have the time to pack up Qs every few days. You'll have to wait till Barbara has the time to register you and send me the list; then till I have time to register you my end, and send the list on to Eph; and then till Eph has time to register you and to put a Q into an envelope and post it. That's why some of you had to wait a couple of months this year. Next year you may have to wait longer, because we all three get busier every year.

FURTHER TO: Bull.58 (Carl Willett's query about woodworm): A conservator whom I respect has come out strongly in favour of freezing. He says that the ordinary domestic freezer gets quite cold enough to kill off any woodworm and most other such parasites, and that freezing an instrument shouldn't do it any harm. I hope that he is right and that any residual moisture in the wood won't expand as it freezes and crack the wood (most of us, I suspect, have as children put a bottle of water either in the refrigerator or on the window sill in cold weather to see what happens, and have found out that frozen water takes more space than liquid water!). Certainly if this is a safe procedure for the instrument, it's very safe for the player. If your own freezer isn't big enough, you can probably find a friend with a chest freezer, or even try the local butcher or fishmonger. More comments on this would be gratefully received.

Comm.963: OUP ask me to point out that Cyril Ehrlich's *The Piano* is a New Edition. How this differs from a '2nd, revised edition' (which is what I said) I'm not certain. More importantly, they had forgotten to tell me that there is a paperback edition of it which costs £9.95.

Comm.966/967: Michael Ransley tells me that the recommended retail price in the UK for the Aulos 'Stanesby' is £375, and that the price for the 'Grensers' (which are at modern pitch) is £165. For the benefit of foreigners, a good many things are sold in this country at a recommended retail price, though (thank heavens) there are always a few mavericks who are willing to sell them cheaper, though they're not easy to find and, on the whole, the market is sufficiently tied up that they sometimes find it difficult to persuade wholesalers to supply them. Michael goes on: "These seem quite high prices when compared to handmade flutes by reputable makers, made with silver mounts and good quality ebony. I should have thought that it was possible to make these plastic flutes for a similar price to the recorders, although of course they are likely to be sold in much smaller quantities." I agree with Michael on this, and am very disappointed
at this news, for I had hoped that the 'Stanesby' would be the ideal beginner's baroque flute, just as their plastic recorders are, especially for schools, colleges, and so forth, so that young and thus relatively impecunious players could find something at a reasonable price, from which they could go on, if they become seriously interested, to handmade instruments of high quality. It would be interesting to know what they are selling for in other countries.

Comm.978 ff: There's only been one comment about printing in columns. Donald S. Gill says "Don't like it, but don't feel strongly about it". I find it a bit easier to read, though the gap between the two columns was wider than I expected, so unless and until more comments come in, I may stick to it. Doubtless somebody can explain to me why a half-inch gap between columns becomes, when reduced to half size, a gap of 3/8" and not, as I'd expected, a gap of 1/4".

Comm.981 & 982: As you'd expect, there has been quite a lot of comment on this, some of it in Comms herewith, some shorter, and some verbal. Two things I want to say first: a) I'll be good and won't do it again (though reaction to the presence of 982 has been about 50/50, with several people saying that I'm welcome to comment on their things in the same issue) ——I don't often lose my temper (my wife may not wholly agree!), but when I do, the results are a bit like that; and b) to emphasise (I did say this in 982 but I don't think that everyone has registered it, judging from things that some people have said to me) that it is normal practice (there are always some exceptions, particularly with cars and such major items) for the reviewer to have as his or her property the reviewed thing. Certainly this normally applies to books; it applies to concerts and plays to the extent that the reviewer has the pleasure (or otherwise) of the performance; it applies to records. And it was applied to Aulos flutes and recorders. So anyone who was worried about what Lewis did to his flute (and what I've done to mine under his guidance) need have no fears; it is as our own property that we were messing about. Similarly, I normally review my books in the margin (as I often do to books I buy), which saves me time and trouble in writing the review, and I believe is useful to my students who may borrow them.

John Cousen writes: Of course FoMRHI must go on reviewing. Reviewers have always been useful people: good, well balanced and well informed reviews are the oil in the machinery of buying and selling, whether it be books, plays or music. The fair reviewer will survive, the unfair reviewer will not; common sense prevails.

Julian Goodacre wrote: I was interested in Comms 966 and 967 as plastic is an interesting (and threatening!) answer to all our problems (yes but...). I can't see any reason why FoMRHI should not have a few such reviews.

Philip Davies said: Please continue reviews both of books, products, musical instruments, whatever. DO NOT be put off by aggrieved authors. Reviewers do not claim to say more than their own (more or less) informed opinions, given their own limitations...

These cover the main points that have been made in all the shorter responses. I'm inclined to say that I'm grateful for them (and for the support expressed in many of them) but that, if they'll forgive me, we don't need to print them all.
We will take it that you are, on the whole, in favour of continuing reviews, and that anything that may come in is all grist to the mill. I am, by the way, careful in this. Books (or anything else) that have come for review get reviewed. Things that I’ve heard about, or have bought that I think may interest you, you sometimes get told about, but very much more briefly. I make occasional exceptions (eg The Galpin Society Journal recently, and The Historical Brass Society Journal and Bulletin in the last Q). A useful book that I’ve bought recently (and that I think well enough of that we’re selling here in the Bate) is Clifford Bevan’s Musical Instrument Collections in the British Isles (Piccolo Press, 10 Clifton Terrace, Winchester, £7.95) which lists, with some detail, most of the museum collections in this country. But since he hasn’t sent it for review, I’m not telling you anything more except to say that I and at least one colleague have found it very useful indeed.

Comm.985 (Old Wood): John Leach writes:

In the Handbook for the Ch'ın, the Chinese board zither, "Yu-ku-chai-ch'in-pu" by Chu Feng-ch'ıeh (literary name T'ung-ch'ıun) published in 1855, it is written that the most important thing is to see that the wood used is old and entirely dry. Dry, decaying pillars from ruined temples, and even boards from excavated coffins are highly recommended. Fanciful associations also play a rôle: one should try to find a mouldering pinetree overhanging a bubbling mountain stream, or a weather-beaten cedar in a secluded vale.

A Comm. from David Freeman herewith: (Relax; this is within permitted limits) David wrote to me a while back about plans, and I sent him the Bate list. I said that we couldn’t send copies of everything free, but that we’d certainly help with some, and I hope that most museums would do the same. So the early musicians in Prague seem well organised and are slowly becoming better equipped. I hope that this is true for the whole of Czechoslovakia, although since there’s always rather more tension between Czecho- and -Slovakia than between England and Wales (or Scotland), I’d be happier about the situation there if we had a report from Bratislava, too, and indeed much happier if we had some members in Bratislava, or elsewhere in Slovakia, as well as the very active group in Prague.

What about the rest of Eastern Europe? We’ve never had a regular contact in Poland (there have been a couple spasmodically, but they never lasted). Isn’t there any interest there? What about Hungary? I don’t think that we ever had a contact there other than the curator in the National Museum (she’s still a member, but I’m not sure how active she is; she wasn’t at the last two CIMCIM meetings), and we have only two in Romania (well, three if you count both halves of a married couple), and we never get any feedback from them about what’s going on and what, if anything, they need. Our only Yugoslav member didn’t renew this year (he always managed to get money to pay his sub himself). Even in the USSR, we don’t hear much from our Leningrad members and nothing at all from anywhere else, though we have members elsewhere.
FoMRHI is willing to do its best to help, and not only in those countries. If you know of anyone trying to get Early Music going in any part of the world where they need help, let us know. If the person is an enthusiast, like several of the Prague group, we'll do our best, and, as they get established, I'm sure that others will, too, just as they have in Prague, as you can read in David's Comm.

SAFETY WARNING: A student violin maker who was in here the other day told me a story. He had an open bottle of Superglue on the bench and said to himself "I must be careful not to knock that over" and, of course, almost immediately caught it with his sleeve and did so. He wiped it up with a cloth, which got fairly fully impregnated with the stuff. The cloth started to wrinkle up as it dried, as one would expect, but what is important is that it got so hot that smoke started to come from it. So be careful; if the same thing happens to you, get the cloth outside fairly quickly or else you may find a fire starting. Presumably the heat from the small amount one would use to glue a crack isn't going to do any harm as it cures; it's when it's a large quantity like this that the fun may start.

QUERIES: Donald S. Gill asks: "I have always thought bocal was a length of tubing not forming part of the sounding length of the instrument and crook was a length of tubing forming part of the sounding length. The New Grove DOMI defines bocal as as the crook of a bassoon, serpent, etc. I seem to be in good company since Alec Loretto's recent Comm 954 talks about the Prague Bressan bocal. What is the definition of a bocal?" I replied to him: "As far as I'm concerned, bocal is American for crook, though I think that they only use it for woodwind and not for horn and trumpet crooks. I've not looked up the etymology but would assume that it's related to French bouche, and thus something you put your mouth to. If this is so, it might be correct to use it for a bass recorder, but not for a bassoon, so that you would be right, that it applies to crooks which are not part of the sound chain. However, Americans do use it for bassoons and for cor anglais. We'll see what others think." So what do you think?

A Query from me. Can anyone tell me what's happening about German post codes? Presumably either those from the ex-DDR or those from the ex-BDR (or both) will have to be changed. Looking at our List of Members, we have some in Leipzig (DDR-7030) and Uta in Ludwigsburg (D-7140); I'd assume that they can't both stay like that or there'll be chaos (maybe there is already, but I have the impression that the German post office is fairly efficient).

PERMUTED INDEX: Donald also says "I find the Permuted Index very useful. I would be willing to pay extra to get it every two years as a five year gap would beat my memory". So, again, what do you think? We would need to have a fairly firm idea of how many of you would be willing to pay an extra two or three pounds before we printed it.

COURSES: If this reaches you in time, we've fixed another Bate Weekend this term, Bow Rehairing and an Introduction to Bow-making on November 17/18, with Andrew Bellis. I would stress that this is modern bows (though the principles are much the same). Places for this one are strictly limited, so you MUST book in advance. This is because there is a limit to the number of people that can fit round a work bench here. Participants are welcome to bring a bow that needs rehairing (plus an extra £3 for the cost of the new hair) and do the job on the spot.
Weekend cost is the usual £20 (£15 for Friends of the Bate Collection and students). Andrew is working on a new, and more detailed, catalogue of the Retford Collection, with a proper description (weights, free hair length, and so forth) of all the bows in the original Retford Gift and in the Retford Memorial Collection.

Next term we have a Hand Horn Weekend on February 16/17 with Tony Halstead, about the best early horn player in this country. There will also be the usual repair and maintenance side to it, I hope with Peter Barton, but I've not yet been able to get hold of him. Costs as above. Both Weekends will be the usual timing, Saturday 10.30 for coffee, starting work at 11.00, finishing when we've all had enough (usually 7'ish), Sunday coffee at 10, start at 10.30, finish about 6.00 so as to allow time to get home. For those who've not been for some time, I don't nowadays go out at lunch time, but bring my own lunch in, so anyone else who prefers to eat their own food is also welcome to bring in sandwiches etc. There's always coffee and biscuits (for which we have to charge 20p a cup to cover the costs) on the go.

Please remember for both (and all Weekends), cheques to The Bate Collection; it may be mostly FoMRH people here, but it's the Bate than runs (and pays for) them, not FoMRHI.

MUSEUM NEWS: We were recently bequeathed the only surviving harpsichord by William Smith (Boalch2, p.168), a single manual of about 1720. Michael Cole has pointed out that it appears to be identical to the one that Handel is sitting beside in the Mercier portrait. I'm waiting for a better photo of that than the one on the front of the National Portrait Gallery Handel Exhibition Catalogue. It needs restringing, which should be done in the next few weeks. Another new acquisition is a very pretty Kohler comet with Shaw's disc valves, in its original case with most of its original crooks; this was given to us, as their first gift, by The Friends of the Bate.

The Bate Collection Annual Report for 1989/90 will be available by the time you get this. If you want a copy (free), write to me and ask.

We can't afford to produce illustrated guide books, like other museums, so I've written two books (so far) for Shire Publications. One is The French Horn and the other is The Flute. Each costs £1.95, so they'll make good stocking fillers (they'll be out before Christmas). Don't expect to learn much from them (I was limited to 5,000 words!) but each has more than 50 photos of instruments from the Bate Collection. They'll be on sale in most book shops (Shire books have a very wide circulation), but we'll stock them here, of course. Postage will be about 50p in this country and about £1 abroad (I have to guess because we've only had page proofs so far).

The Edinburgh University Collection of Historic Musical Instruments has announced the first volume of their Catalogue, Volume 1 The Illustrations, with nearly 400 photographs. Due out in August this year at £25 (p&p £3.00 in UK, £5.00 abroad). Whether it's out yet (October), I don't know. Address is Reid Concert Hall, Bristo Square, Edinburgh EH8 9AG. The plan is to follow it with fascicles of texts which will, as they appear, replace the present Check Lists.
NEMA: The National Early Music Association is producing a new edition of its very useful Register of Early Music in December. It will cost £6 (£4 to those listed in it if you order before December) but is free to NEMA members (£10 per year; you also get much reduced rates for advertisements in the Register and in the new Journal, as well as helping NEMA in the very important work it does in the educational sphere, which is where your next generation of customers comes from). NEMA is also upgrading its Journal from 1991 and calling it Leading Notes. Advertising space will be available; ask Simon Hill, 20 Wolseley Gardens, London W4 3LP (tel.081-995 2757) for a rate sheet.

DEADLINE FOR NEXT BULLETIN: December 31st (there should be a post that day, though if I know the post office they won't bother, and there certainly won't be one on the 1st).

We did a good summer in the end. Have a good autumn and early winter

Jeremy Montagu
Hon.Sec.FoMRHI

BULLETIN SUPPLEMENT

WATCH OUT – IT’S LOADED!

We’ve received a rambling but interesting Comm from a non-member, Mimmo Peruffo of via Constantini 16, 36100 Vicenza, Italy. The title is "New hypothesis about the construction of the bass strings in the European baroque plucked string instruments". It was too poorly duplicated for reproduction here, so I will provide a summary and commentary:

Summary: Peruffo addresses himself to the problem of the holes in some of the apparently original bridges on lutes from before wound strings were available. They are too small for bass strings made of ordinary gut that can fit in them to sound well. His solution to this problem has been to explore loading the gut with heavy metal salts. In his experiments with treating commercial strings, he got a 20-30% increase in weight using traditional dying technology and materials, absorbing the salt solution and then fixing it. By optimizing temperature and time, he raised this increase to 40%, and by using modern chemicals he could get it up to 50%. He then experimented with treating fresh gut with the salts in a glue medium (using historical or modern glues) before being twisted into a string. When the salt was in solution, he got a 30% increase, and the strings were quite stiff. When the salt was a powder slurried in the glue, he got an 80% increase consistently, and at times much more. These strings were surprisingly flexible. Their deep brown and red colours are reminiscent of Thomas Mace’s description of Pistoy basses, and Peruffo believes that he has recreated them. He intends to improve them with an eye towards producing them commercially. This may be related to the fact that his writeup contains remarkably little more detail on the methods and materials used than given here.
Commentary: The hypothesis is not new. The idea that early gut bass strings could have been loaded with a heavy substance has been a subject for speculation for many years. I mentioned it in my Comm 773. But this is the first report that I know of giving results of systematic experiments with it. It is very welcome. It is quite possible that the Pistoy basses that Mace wrote were "the very Best" were made by Peruffo's method. Whether they were in general use for plucked instruments in the baroque is another matter. Mace wrote that they were "hard to come by" and that good Lyons strings "will serve very well". Since he remarked that Pistoy basses were smooth, the implication is that Lyons were not, and so were likely to have been of rope construction. I expect that before Peruffo markets his strings, he will have them checked for toxicity according to modern rather than historical standards.

MORE ON CONSERVATION

In the Northwest of England where I live, there are several substantial collections of musical instruments. A miniscule fraction of one is all that is on public display. Most of these collections are in the charge of people who know little about old musical instruments or their conservation. Their primary responsibilities, background training and serious interests are quite remote from dusty old musical instruments. Requests to see the instruments are rare, mostly by instrument makers or musicians who want to measure, sound or otherwise learn from them. The keepers of the instruments are torn between their desires to be helpful and their responsibilities for preservation. The latter is only understood in terms of barriers to access: These barriers are usually lifted if the requester is sufficiently respectable, self-confident and persistent. When permission is granted, the instruments are made available with little if any supervision (the person in charge is embarrassed about not knowing enough to contribute usefully to conversation about them).

This is not a good situation for conservation. The collection belonging to the music college was acquired as a resource for the students and staff, who have been free to borrow them and almost do whatever they wanted with them. Over the years many instruments and accessories have been lost or incompetently modified. Jeremy and I once spent a curious afternoon with the ethnic instruments of the collection, putting them together from pieces loose in boxes and creatively plugged into other instruments to which they did not belong. From this point of view, I feel a sense of unreality while following the discussion on conservation training.

When I wrote Bull Supp 52 and made the unfortunate statement: "There is a danger of creating an exclusive elite of professionale", I was thinking about a corps of professional conservators that does not yet exist in this country. They would be trained in our educational institutions as professional makers and repairers, with restoration being a high-class form of repairing, and a bit of conservation having been thrown in for good measure. I feared that they could be accredited as professional conservators without fully embracing the ethics of conservation. This is particularly difficult in the field of musical instruments. The pressures to restore and use these objects to perform the functions they were made for are very strong indeed, and when these pressures cannot be resisted, doing the best one still can do for conservation is often not the easiest option.
In Q 54 I was taken to task by Bob Barclay (Comm 899) and Cary Karp (Comm 900) for my "elite" remark and not understanding that the accreditation debate was primarily a fight within the museum community for raising standards of conservation quality and the status of conservators. It was easy for me to bow to their criticism in Bull Supp 54. I don't know any elitist conservators. My fears about developments outside the museum community were not allayed though, and when the Conservation Unit's publication surveying Conservation Training appeared, it seemed that they were realized, and I complained strongly about the situation in Bull Supp 55.

Recently I've received a new publication from the Conservation Unit entitled "Education and Training for Conservation" by Kate Foley. It is a well thought-out monograph, offering much wisdom. The good news is that the courses on making and repairing musical instruments are dropped from the list. They just have't had enough commitment to conservation. Under 'Other Courses' the monograph states: "There is no doubt that some of them occupy a unique slot in specialist provision, but others merely reflect local opportunism, and although they may carry a 'conservation' label, they do not necessarily have a content to match their title". The bad news is that the conservation of musical instruments is not mentioned anywhere in the monograph. The courses mentioned cover bookbinding, paper, furniture, clocks, ceramics, textiles, paintings, sculpture, metalwork, architectural stonework, and archeological finds. The monograph identifies gaps in the provision of conservation training courses to be in social history, textiles, industrial collections, natural history, ethnography and geology. Musical instruments are nowhere. Perhaps this is because in this area, institutional employment opportunities and recognised trainers are scarce in the UK. But what about the needs of the collections? So with no pressure from within the conservation movement, nor from outside it, collections like those here in the Northwest will languish in neglect for some more years until musical instrument collections and their conservation become more fashionable. If the debate on conservation standards and accreditation is none of our business, musical-instrument conservation is, and so should training for it be, at least for ourselves and any other keepers of old instruments willing to learn. Should not we, perhaps in cooperation with other interested societies, discuss what we can do about it? It seems that no-one else in the UK is.

CHANGE OF ADDRESS: We have been notified of the following new address: THE CONSERVATION UNIT, Museums and Galleries Commission, 16 Queen Anne's Gate, London SWI H 9AA; phone: 071-233-4200

LATENESS: I am guilty again for a delay. Both of my printers gave out in the week before the Comms came from Jeremy. Training a new printer to listen to my old beloved 1970's Apple will have to be a leisure-time project. The delay has been in shopping for and buying a new computer and printer, learning the use of a new word processor (without an instruction book) and learning to control the printer. Sorry.

The attribution to Sumi Gunji is guesswork; I can’t find an author’s name in roman script, but she was responsible for the last two, and these are to the same enviably high standard. As I’ve said before, and doubtless will say, again, these are the ideal teaching material, and I only wish that I could produce something as good for my students.

An enormous range of flute types is covered here. All are illustrated, many of them in X-radiographs, especially some of the more complex globular flutes and whistles, and many with section drawings showing the windways or the shape of the embouchure. The embouchure profiles of the transverse flutes are very interesting; I had not realised how much variation there was. Some are undercut, some outward-sloping, and so forth.

As always there are distribution maps, but it is particularly frustrating (why should we complain? It’s up to us to learn Japanese if we want to read Japanese books) that the names of many of the instruments are given in roman script (not always, though) with the photographs, but very seldom (just occasionally) where they come from. In many cases I know the answer because non-European instruments are something that I work with, but there are some that I don’t, and many that non-specialists won’t know.

Even as it is, with so much of the information in Japanese only, there is an enormous amount to be learned here, and the illustrations are extremely valuable. How available these handbooks are outside Japan, I don’t know, nor for that matter how far within Japan but outside Kunitachi College, but they are well worth trying to get if, like me, you believe that music is an indivisible art and that one should regard the world as a whole. This is quite clearly the rationale behind them; flutes are described typologically, without any geographical distinction or separation.

As you will already have gathered, I cannot recommend these too highly, and I am green with envy that they are able to produce such excellent material! I just wish that Kunitachi College would do us all the great service of producing English editions of these handbooks. How well they’d sell to the general public, I don’t know, but for students of organology, there is nothing available that I know of which could be compared with them in any European language.
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FoMRHI Comm. 989


This is a special number, produced by the Civico Scuola di Luteria di Milano, and I imagine that you could get a copy from them; their address is in the List of Members. There's no price stated.

There are five articles, ranging from the useful to the simplistic. The first is one of the most useful, a study by Analys Restrepo of the vihuela, with a detailed discussion of the problems of the Musée Jacquemart André instrument.

The second, by Stefano Avon, Guidalberto Bormolini, Marco Manilli, and Donatella Melini, is on the origin and evolution of the fiddle from the 12th to the 16th centuries, all in 7 pages. What is quite useful is a series of sketches, particularly those of body profile (full-face).

The third, by Francesco Augelli, is a very summary description of the restoration of a 'spinetina' (what we'd call an ottavino virginals). Not only is it summary, but it seems to consist of pretty well a full rebuild, rather more than most of us would consider doing. There's no real description of methodology; only, for example, 'glued with hot glue'.

The fourth, by Paola Mezzanotte, is a note on the history and use of the serpent; nothing very new, but there is a marginally useful list of serpents in museums which is by no means comprehensive. For example, it lists two for the Bate, whereas we have six. I suppose it would help someone to start looking, but that sort of slipshod research is not encouraging for the accuracy of the rest of the article.

The fifth and last, by Carlo Chiesa, is a history of the violin from its beginnings in eleven pages with some useful pictures.

The pictures, where they are drawings, are good throughout, but where they are photographs they are pretty murky with rather less visible than the captions would have you see.

FoMRHI Comm. 990

Review of: Larigot 8, September 1990

The initial focus is on the Sudrophone, that curious combination of brass instrument and kazoo, which was made in the full range of sizes from bass tuba to cornet. I've never heard one, and it would be interesting to know just what effect the membrane has on the tone. The advertisements and catalogue pages reproduced here speak well of it, as one would expect.

This is, of course, one of the most useful features of Larigot, that it reproduces great chunks of catalogues, few of which are available today even in libraries, so that we get the original texts describing instruments, the original steel engravings of them, and also the price lists.

This issue goes on with extracts, facsimile again, from Alexandre Petit's comet tutor, and then pages from Couesnon's catalogue of the various cornets and trumpets to which Petit's name was attached, followed by other Couesnon instruments such as sarrusophones (very interestingly with single-reed mouthpieces) and the new 'Monopole' horn. This was available as either a normal system, or with ascending third valve (as we have in the Bate Collection) and with transposing valves added to the crook, something that I've never seen an example of.

Bruno Kampmann and Pierre de Buchy contribute an entertaining article on the Cuckoo.

The main emphasis of Larigot is on brass, as a rule, though there are usually some bits on woodwind. While not as important for the early instruments as the new Historical Brass Society, they cover the odder corners of the late 19th and early 20th century in a way that nobody else does. Subscription is FF.130 and the address is 93 rue de la Chapelle, Apt.166F, 75018 Paris.
As in July 1983, when in Comm.482 (Q 32) I reviewed the first volume of this Catalogue, I'm not certain whether this has come for review or as an exchange with the Bate or me. However, this Collection is growing space and, while still small when compared with somewhere like the Shrine to Music in Vermillion, they have a number of important instruments, so that it is a collection that you should know about.

The first volume was issued in 1980 to celebrate their 75th anniversary; this one, in 1990, celebrates their 85th. In the intervening ten years, they have obviously been buying selectively to fill gaps in the collection. For example, there is now a Bressan treble recorder, a Souch voice flute, and an anonymous ivory descant to put beside the Haka voice flute, and a Stanesby junior traverso to go with the Heinrich Grenser.

Let me do what I did in 1983 and list, from the back (for uniformity) what there is in this collection.

There are six new bows, including two nice-looking violin bows, one by Liessem and the other anonymous, probably English, first half of the 18th century, and a nice-looking bass viol bow, with two later cello bows, one attributed to Louis Tourte, and a small violone bow.

There is only one brass instrument, a handhorn by François Riedlocker, with all crooks (there were no brass in the first volume). Also considerably expanded is the woodwind department, for where there were only the instruments noted above, plus three other flutes of no great importance, one oboe, and two clarinets, there are now two bassoons, a Porthaux and a Sattler (both 7-key, the seventh being the wing key), two more clarinets, a Cahusac and one marked Schuchart but thought to be by Collier (both 5-key), a Fornari cor anglais (three brass keys, the third being the G♯), a Millhouse [sic] vox humana (3-key, as the cor), three oboes, by Prudent, Richard Milhouse, and Cahusac senior (all 2-key), and a 6-key (4-key with C foot) William Henry Potter flute with three upper body joints.

The only new keyboard is an anonymous late 18th century fortepiano, not much of which is original.

The three new string instruments are also all anonymous, a pardessus, a bass viol, and a violin-shape quinton.

All the instruments are photographed from all significant aspects, plus details of makers stamps and other features (though no X-ray photographs this time).

As in 1983 (though with some slight improvements) it is still clear that there is more knowledge of string instruments at Ueno Gakuen than of wind. Pads are referred to as 'skin' instead of leather, and keys, for clarinets but not for flutes and oboes, are still described as screwed instead of pinned. More seriously, the keys of the cor anglais and the vox humana are listed by actual pitch and not, as everybody else always does, by their oboe (ie written) pitches; since these are transposing instruments, the open great key is a C-key, even though closing it produces a sounding pitch of F. The oddity of the horn is not commented upon, and presumably not recognised: the highest crook is a straight shank for A (not a coll) and B♭ alto is achieved by a tuning slide crook with its own mouthpipe, a rather unusual arrangement for a horn, though similar to that for putting cornets, which normally have a straight shank for B♭ into C.

The photographs are good however, and the descriptions are all clear enough that we know exactly what is there, and it is a good, even though small, collection with, now, a number of important instruments in all departments. We await with interest the celebration of their 95th anniversary in the year 2000.

I have only very recently heard of this publication; hence a review three or four years late. It consists of some (and only some) of the papers given at the UKIC Symposium at the Victoria & Albert Museum in December 1983, on which I reported fairly fully in Q 34, Comm.501, January 1984. As I said at that time, "The most important, and the most thought-provoking paper was Derek Adlam's on the Ethics Involved in Restoration. He was the only speaker to make a firm distinction between Conservation and Restoration..." Unfortunately, that, with Peter Thornton's introductory paper, is the one paper which does not appear here. Possibly it was precisely that distinction which prevented its inclusion; the Symposium was advertised as on Conservation, but the title under which it has been published is Restoration. Derek isn't, and has never been, a FoMRHI member, but maybe I'll write to him with a copy of this and see if he'd like to publish that paper here; it would be worth reading.

As for the papers which have been published, they also are worth reading, or at least most of them are. Carl Dolmetsch's is no more relevant to the subject (neither to Conservation nor to Restoration) when one reads it than it was when one heard it; it is entirely on visual beauty of instruments, with no reference to sound.

Peter Mactaggart's on 'Examination and restoration of paint on musical instruments' is, as one would expect, excellent and expert. It is essential reading for anyone who may have to deal with a painted instrument, whether decoratively painted (eg soundboards) or furniture painted if one may coin such a phrase (eg outside casework), and describes the often very surprising amount of information about what has been done to an instrument that one can glean from the examination of its paint.

Charles Beare's 'Restoration of violins, viols and related instruments' (there isn't, in the event, anything about violas) reads differently from my memory of it. It may, of course, have been edited subsequently, but my memory is that it was rather more strongly than it is now on the main function of violins etc being to modernised and played in normal symphony orchestras. It wasn't quite 'the best thing to do with an untouched original is to modernise it' (he does, and did, say quite specifically that if it's past all possible restoration, then it should be left untouched and put in a museum), but there was something of an implication to that effect. If four years later, this implication was eradicated, that's all to the good.

Reg Dee's paper on 'Restoration of musical instruments at the V&A, 1964-68' was, and remains, extremely interesting. The paper only describes, whereas at the symposium he showed, some of the very ingenious devices he constructed for lack of the proper equipment, some of which would be useful to anyone faced with a one-off job of inconvenient shape and size.

Frances Palmer's 'Musical instruments from the Mary Rose' reveals none of the frustration which was apparent on the day when, at the last minute, the Mary Rose people reneged on their promises and refused to bring the instruments up to London for the occasion. As a result, she could do nothing much more than repeat what she had already published in Early Music, with a little more information.

Some of the ensuing discussion is also printed here, from which one can glean a little of the main thrusts of Peter Thornton's paper. There is also a Bibliography, but a very odd one indeed. It includes a large number of inaccessible and, on the whole nowadays, useless 19th century material, but none of the standard books (eg on string keyboards Raymond Russell, Frank Hubbard etc). There are, however, a few conservation papers listed.

As something to start one thinking about just how much one should do to an instrument, it is well worth reading, and it is an indication of some interest in musical instruments on the part of UKIC, which should be encouraged. It is a subject on which we are badly behind some other countries (eg Germany and America), and the UKIC is where development in musical instrument conservation must start if it is ever to be established here.
This publication consists of papers given at a conference, and thus it was obviously unnecessary to tell any of the participants who Marguerite of Austria was. It appears (from one of the papers) that she was a (?the) daughter of Maximilian the Great and, after a couple of marriages (to Juan of Spain and Philibert II of Savoy), became governor of the Low Countries, "inheriting her late brother's (who not stated) magnificent chapel". As a result, several of the papers are on the music of that chapel, specifically on the two surviving chansonniers, though one (by Honey Meconi) is on the secular music at her court (and is in English; it is from that paper that I took the information about her above). Another in English and on secular song is Warwick Edwards on 'Text Underlay in ... Chanson Album Brussels 228', which appears to be important, probably controversial, and almost certainly useful. Sorting out just which notes go with which words in music of around 1500 can be extremely difficult. Edwards ends by saying "In short, I would like to stand the whole argument about the sixteenth century theorists and earlier underlay on its head". Not strictly our subject, but a number of us do also work in this area, and for them it will be worth reading.

The three articles most relevant to us are Monika Pink 'Bedeutung und Funktion der Musik im Turnierwesen', Rainer Gstrein 'Tanzmusik-Ensembles zur Zeit und am Hofe Kaiser Maximilian I', and Karel Moens in Flemish on iconographical, organological, and musicalesological aspects of instruments in Marguerite's time in the Low Countries. The last is clearly the most interesting for us and it is frustrating that is in Flemish (our fault, not his, that we don't understand his native tongue). It was he by the way, who proved that the Renaissance viol by Linarol etc were all fakes.

The Gstrein article doesn't tell us anything much that isn't in Uta Henning's collection of the Maximilian illustrations (reviewed here in Comm.805, 1987), though some of the comments are interesting. Tournaments were still an important feature of court life around 1500, and were always accompanied with music, if only trumpet fanfares and drum beatings, which is more or less, with some contemporary quotations and some illustrations, what Fink tells us.

Moens's is much the longest article in the book and is well worth struggling through, book in one hand and dictionary in the other. He is very firm that there was by then a fully professional class of musicians, and of instrument makers working for them. He is also interesting in his class distinctions; some instruments were of high class, some of low, and some of very definitely negative implication (often used by prostitutes etc), but also negative in the sense that they were used in allegories etc to imply all sorts of undesirable aspects of life (something that continued for some centuries when one thinks that most Vanitas paintings included instruments).
1990 Instrument Courses in Prague

Now that the year is approaching it's close, I thought that members might be interested to hear of the progress here in Czechoslovakia in 'Early Music'.

The year started with a playing course in June that was kindly given by Catherine Mackintosh on Baroque and Early Classical String playing. After the usual quiet start (no violins, no music stands and no questions!) by the second day the course members began to feel more relaxed and participation increased in enthusiasm as students realised that here was an opportunity to learn from a true master (or should it be mistress?) of the violin. Catherine's ability to communicate and to bridge the language gap was remarkable and the progress of the students was clear to the ear of a listener like myself. There were around twelve students as well as a small classical orchestra taking part. In the evenings, Catherine also very kindly spent time with a baroque group that were unable to attend the four day course. Every one learnt a great deal and I was able to hear some of the changes Catherine made to the style of playing when one of the students played a solo at the Valtice Summer School later in the year.

In late August we were lucky to have Michael Plant here for an intensive seven day Course in Viol Making. There were two professional makers and three students who completed a partly made bass and also half finished a treble. Here again the bridging of the language barrier was made very effectively. Many of Michael's techniques were completely new to the makers and great interest was shown in learning better and faster ways of working. Special interest was shown in the 'bent front' as this would enable makers here to conserve wood that is so hard to obtain. The passing on of time saving workshop practice was of immense value and as all of the makers have approached viol making either from scratch or from violin making, the different techniques were eagerly seized by the students as was advice on the types of viol to make and the effects of the different sizes, particularly in the bass viol. Advice such as this is worth so much to makers who have been able to see so little of other makers work and who have been isolated all their lives from other makers. The use of good strings was also made apparent when we were able to fit up one of the bass viols made by Petr Vavrouš (who has made several bass and a few treble viols already, but has been unable to get good strings) with the strings originally intended for the course viol. The owner has already decided that more strings must be purchased for her other bass! Michael's generosity in passing on so many of the skills he has learnt over the years was greatly appreciated.

Early September saw the arrival of Nancy Hadden for a four day Renaissance Flute Playing Course. There were an average of about nine players most days, with a 'hardcore' of six regulars. Much was again learnt both musically as well as technically. Embouchures will have to be changed for many of the students! New fingerings and breath control also proved a major discussion topic. The enthusiasm of the students was apparent when the lunch hour was devoted to practice rather than eating! Nancy also spent some time with some players of the Baroque flute and again there was much to be absorbed in the short time available. The music played was also of great interest, especially the way it should be interpreted with the flute. The course was particularly valuable as last year eleven flutes were made under Barbara Stanley's expert tuition and several of the makers were present as players as well as others keen to learn to play but not yet having instruments (we hope to solve the shortage of instruments by the early part of 1991 - I shall be spending the winter over a hot lathe!!). Some of the lessons learnt were put to good use recently when a viol and flute player from Berlin stayed with us and she was amazed and delighted to be able to play in a renaissance flute quartet for the first time in her life. Several of the students from last years course have already made second flutes from the blanks that Barbara generously gave them and these are being put to good use. It seems as though Czechoslovakia may become the home of the renaissance flute at this rate of progress!

One of the most wonderful effects of these courses is the demonstration of love and concern for the makers and players here that has been shown by the tutors. The students are all surprised that these generous experts care enough to come here for no fee (apart from the travel costs that are
subsidised by the British Council). The friendships and happiness that grow out of the courses is in some way more important for the moral of the people here than the actual subject of the course.

Another exciting result of Alec Loretto's course last year is the appearance of a maker of recorders. Now we have solved the problem of cedar wood (thank you very much Don Gill for your advice in reply to my query in FoMRHI), Pavel Cip is producing some very well sounding trebles and with the help of recorder makers in England hopes to start on the bigger sizes shortly.

The Society of Makers of Historical Musical Instruments continues to thrive and holds regular quarterly meetings. The Viola da Gamba and Lute Society of Czechoslovakia was formed early this year and also meets quarterly. Ellen Powers from the Viola da Gamba Society of America was here recently and brought a wonderful box of 'goodies' from friends in the U.S.A. - strings, rosin, peg paste etc. This again has helped to make people here aware of the friendship of musicians worldwide. We are looking forward to the visits of a lutenist and a viol group at these meetings next year.

So, 'Early Music' is alive and growing here at a good pace. The musicians have always been here, but now they are starting to be able to get the right instruments to play on and to meet players who have studied these renaissance and baroque instruments for many years, this is a great step forward. 1991 will hopefully see courses in baroque oboe making, singing, baroque cello and viol playing, as well as a Festival of Early Music and an Exhibition of Early Instruments (viols, recorders, flutes, shawms, lutes, harpsichords and organs).

**Comm 395 REVIEWERS AND REVIEWING Roy Chiverton**

If a chap wants something reviewed, he sends it to a reviewer, usually one whose opinions he is happy to accept. If he didn't think of it but liked the idea when it was put to him, same result. If he doesn't want it reviewed, he doesn't send it. If he sends it, he accepts the status of the reviewer. Be the review favourable or unfavourable, he gets publicity. The review reader judges the review by what he thinks he knows of the reviewer. *End of story.*

Well, end of story unless you think the chap who sends for review has an unfair advantage over the chap who doesn't. Given the custom that the reviewer keeps the item reviewed (but does this apply to cars, washing machines and the like?), the producer of what is reviewed must be able to afford to give it away - but does that constitute an unfair advantage? If you think so, I guess you're wrong. But I still don't think it's worth making much of a fuss over.

So why Jeremy should think Ardal's comments could lead to the end of FoMRHI as we know it, I don't see. Why do we have to polarise arguments? I am reluctant to come "between the fell, incensed points of mighty opposers", but, without seeking kercuol's fate, I am inclined to cry "a plague on both your houses", and quote again "a soft answer turneth away wrath". Of course reviewing should and will continue, but it doesn't need pistols for two, coffee for one to achieve this...where, oh where did Enoysen (Hendecaryllabics) get that idea about "indolent reviewers"?
Quarterly No. 60 was thin, rather late in arriving here (7th September), but exciting. I read the Powell-Montagu dispute with intense interest and, I must say, with clear party. I really can't imagine what Ardal Powell is concerned about; the problems he addresses are in no way unique to musical instrument review. (By the way, I have found the reviews in question valuable, and as an instrument maker I am not jealous that Mr. Toyama has received free information. Of the recorder makers named by Mr. Powell, I know for a fact that at least one has been very generous in passing on information to other instrument makers, and it seems the greater injustice to him would be not in undermining his market on information but in underestimating his generosity.) On the other hand, I do think Jeremy should stick to his own rules, or at least there should be a consistent policy on simultaneous publication of responses to communications. What that policy is, is less important to me. For myself, if I ever again find time to write a communication, anyone is welcome to criticize it at any time.

In addition to the need for a consistent policy, this dispute also makes apparent again the need for a little more courtesy in the pages of FOMRHI Quarterly. Whatever he feels about reviews of musical instruments, it seems unnecessary for Ardal Powell to imply that Jeremy had entangled himself in a web of morally objectionable decisions, to impute that Jeremy was perhaps intending to enrich himself with the donated instruments, to suggest that Jeremy might take the matter ad absurdum by requiring Australian harpsichord makers to send in free samples for review. And Jeremy's tone reminds me a bit too much of Charles de Gaulle. First he offers his resignation, then he puts to question the very existence of FOMRHI. That puts quite an onus on anyone who might want to argue Powell's side.

As a matter of fact, I can remember other hot disputes in FOMRHI's past. Whether or not the combatants felt injured is hard to know. Many enjoy a good intellectual tussle. But this Quarterly is distributed over a wide area to readers of heterogenous background and it seems that a minimum of decorum should be preserved, and be it only for the sake of the readers.

REVIEW OF MUSICAL INSTRUMENTS

I was encouraged to see the reviews of musical instruments in the April Q, and amazed at the height of Ardal Powell's complaints:

Many of the points he raised, in the form of rhetorical questions, have to be considered by reviewers. But, as he raised them as questions and did not in fact give any answers we don't really know what he thinks; we just know that he has cast a lot of aspersions on the practice.

And it was good to get Jeremy's reply in the same issue. It is great to have the whole battle at once, rather than spread out over a year. I fully support Jeremy. Reviews are interesting, topical and useful. As an (ex) instrument maker I feel that if one has confidence in the quality of one's work, one should be happy to have it reviewed. It is not necessary to give instruments away. Loans will do. That is how cars and computers are reviewed. Courage, Jeremy, we are all with you.

But from my present position as a magazine editor. I say - keep it, Ardal, you are doing a wonderful job making the Q a good read. But please stop short of making Jeremy take you to court.
Further still to Comm. 981

I am sure that most people, after reading the reviews of the Aulos plastic recorders & flute (Comms. 966 & 967), responded as I did with no more than an interested reaction to the movement of part of the "mass production" musical instrument industry into the "historical" instrument area. At no point did I question the "morality" of reviewing these instruments and I am still at a loss to understand the wildly extrapolated arguments which Ardal Powell (in Comm. 981) has proposed against such reviews.

I support Jeremy Montagu's reply in Comm. 982 where he examines the whole principle of peer review and would add that, at least to myself, a mass-produced item, whether it be a musical instrument, motor car or washing machine, is a fundamentally different article from a hand crafted one. Assuming competent quality control, any example will exhibit identical characteristics to any number of reviewers just as the readers of a book or viewers of an opera or film will be presented with the same performance. Their individual reactions to this common experience will, of course, vary and long may it be so!

While there is, of course, always a team of people behind the design and manufacture of plastic instruments, any criticism, whether positive or negative, will be directed at the company name and will thus be more oblique than criticism directed at an individual craftsman who is personally responsible for all aspects of his output. There will also, inevitably, be slight differences between examples of hand-crafted work. Thus I do not see the inclusion of the reviews of plastic instruments as a precedent for a flood of reviews of the work of individual makers.

In the Aulos reviews, Montagu restricted himself to the physical aspects of the instruments while Lewis Jones examined the playing and tuning characteristics. Both were thus acting well within their areas of knowledge and experience for the instruments concerned. I find Powell's implicit & explicit questioning of their competence downright arrogant after he, in recent Formhi Comms., has appeared in the guise of computer programmer, etymologist and authority on endangered wildlife & world resources. Given the Brucknerian length and often sesquipedalian exposition in his articles (not to mention the oversize type-face and line spacing), I think that Powell could perhaps be a little more accommodating and accept other people's attempts at enlightenment as they accept his.

I find Powell's reaction to Jones' modifications of the flute rather puzzling. Such modifications are not reversible but we are not here dealing with a unique instrument, and although I have not, to my knowledge, seen one of Powell's flutes, I assume that he is aware of the improvement to the tone which softening of the fingerhole edges produces. Perhaps Powell thinks that we makers should extend "authenticity" to acting with the obscurantism of the ancient craft guilds and not reveal such trade secrets so that our customers will have to rely on us for our (expensive) services. If Aulos do incorporate these modifications as standard and produce a flute which is as good as or better than more expensive wooden ones, then it is for individual makers to improve their instruments still further to justify the higher price. I am sure that there will always be psychological motives for preferring wood rather than plastic. While it is now normal, even preferable, to replace ivory with plastic imitations, the substitution of plastic for some rare tropical hardwoods would in most cases be unacceptable, although it is, perhaps, a logical extension of the same principle.

Finally, I hope that the inclusion of Montagu's reply alongside Powell's original article in the same Q. is an exceptional and temporary relaxation of editorial policy. If the rule is to be relaxed - and it would seem to benefit only Montagu and Segerman - I hope it will be restricted to the correction of only obvious (and not controversial) "factual" errors, or replying to unprovoked attacks on personal competence, integrity, etc. Any simultaneously published replies should not appear unless there has been communication with and express consent from the author of the original article. I also hope that the editors would use their privilege with extreme discretion.
I've just sent off a letter to a conservatory this morning in response to a request for advice concerning problems they had encountered with a copied Denner 3-key bassoon, recently purchased for student use. Like many in their position they were unable to consult a performer or an early bassoon specialist before they made this major 'one-time' purchase. In purchasing blind like this they have unwittingly spent precious procurement funds on what is basically a near useless instrument: being not very well executed; outdated in design by 10-20 years; and copied (loosely) after an instrument which was in production during the late seventeenth century (probably at a different pitch and temperament), therefore suited in an extremely limiting way to the repertoire written for the bassoon before 1700. Sadly, it is the student who will have to suffer the discouragement involved in trying to cope with what, even in the best of circumstances, is an extremely difficult type of instrument to play.

I raise this situation because it has a direct bearing on Ardal Powell's comments from last issue about the reviewing of reproduction musical instruments. There are grounds to suggest that some form of reviewing might prove beneficial, if not desirable. The first that comes to mind is that unsuspecting purchasers or those without access to professional guidance need somewhere to turn for objective, informed opinion about the faults and merits of what is potentially an expensive and critical purchase. More often than not, this purchase will have to be lived with for a good deal of time and probably play a vital role in a person's career and professional stature. The performer's precarious situation can be illustrated using my own experience. I am drawn back to the late 70's when I was buying, in relative isolation and ignorance, my first 5-key bassoon. At that time I knew of only four possibilities. Deciding between these proved difficult because of my lack of experience and the almost complete absence of pertinent information available at that time. In hindsight the bassoon which would have proved the most adequate was rejected because delivery would have taken well over a year. Unfortunately, I needed something immediately. Two of the other choices proved troublesome. One I ordered, but cancelled for various reasons, the most important of these being a perceived lack of honesty on the part of the builder. Constant delays implied that either he hadn't managed to get all the bugs out or else he was skipping over my name on his waiting list for more famous names. The second, which I eventually ordered, proved inadequate for various reasons and was sold after reconditioning. Though the maker was earnest, he was misguided in aiming

1 I know of no teacher or professional musician who would recommend an instrument such as this for student use, nor do I know of any professional player who uses a 3-keyed Denner bassoon for anything other than the rare, instrument specific, concert.

2 Having since been in the same position of developing an instrument from scratch, I now realize the unforeseen difficulties which often crop up in the early stages of production. Provided the maker is honest about this situation, the customer should be willing to patiently accept (and most do) the nebulous nature of any delay.
to 'improve' the baroque bassoon by imposing modern acoustical principles on its basic design. The result was a stretched, caricature of a Prudent, constructed of dense American maple, and bearing more resemblance to Danish modern furniture than to anything eighteenth century. The third instrument I owned served me well, at least as well as my modest musical skills could be served. Through this instrument I realized that early bassoons need a lot of careful tending; that tuning, temperament, and timbre can change markedly as each takes on the individual player's idiosyncrasies throughout the 'playing in' process; and that each instrument initially must be played (at times coaxed along) on its own individual terms — not those imposed by the player and his expectations. Had I had access to the knowledge I now have, great expenditures of time and effort would have been saved and perhaps my own career as a player would have been markedly altered.

If a buyer lacks experience or access to an experienced player (and even this is no guarantee), or, if distance precludes trying out a particular model, then the only alternative method of finding information to make a satisfactory purchase may be through some sort of musical instrument review. My own experience indicates that there is clearly a need for some form of written assessment to which anyone can turn. What form this takes and how this can be done remains, as Ardal demonstrates, problematic at best.

It was only when I started playing on my own instrument (therefore had no one to blame but myself for tuning difficulties) that I began to see another side of the issue. This, the builder's situation, is well worth noting. Their's is a most difficult task; building instruments by hand is still an inexact science. Rarely, if ever, do any two early bassoons prove similar in all respects — as it should be. In taking stock of the present situation it is clear that there is no previous generation of masters to turn to for advice on how to improve or eliminate perceived faults in constructing these instruments. It is only recently, primarily during the last two decades, that this long dead, archaic tradition began to be slowly pieced together by makers working quite independently of each other. The nature of this sporadic and loosely defined process has forced makers to rely heavily on trial and error, instinct, and a bit of luck. At the same time the demands and expectations placed on the makers' instruments have changed repeatedly. Together this has created a state of flux where, lacking unity and focus, makers and players have yet to define what exactly the desired end result of their labours should be. Add to that the fact that, individually, many seem to have a different

3 This was many years ago and I understand that this particular maker has long since changed his designs to bring them more into line with historically based evidence.

4 Quite Coincidentally, in conversation just a few minutes ago I learned from a bassoonist that there have been very positive reviews by an accomplished bassoonist promoting a particular early bassoon. These were written up in two separate semi-scholarly, musician orientated, journals and, no doubt, has had and will continue to have a significant impact on orders. I found it interesting that this promotion was queried ethically on the grounds of a perceived advantageous financial relationship between the reviewer and the maker, a fact not widely known by those reading the article.
idea of what is to be considered desirable or unacceptable in an early bassoon and it would seem difficult to construct a definable basis from which to fault anyone's work with any degree of absolute certainty. Perhaps early bassoon making is still too young at this point in time to specifically judge with fairness or definitively and, instead, should first be given the time to clearly define itself before undertaking this process.

On the other hand, if it is deemed desirable to analyze and criticize the work of one maker, it would seem preferable to do this in a constructive spirit bent on improving the species generally and not on discouraging the individual maker from continuing his work. As a given, it should be universally understood that everyone, especially those still learning the task (all of us?), should be given the latitude to develop individual skills, thereby encouraging a greater diversity of instrument designs and styles and subsequent increase in choice. This is extremely important because one of the essential features of the 'period instrument' movement is the reclaiming of this diversity back from the tyranny of homogeneity inherent in the modern orchestral sound. Our goal should be the restoration of dozens of types of bassoons like once enriched the world in past centuries; a diversity which the present century destroyed through its systematic consolidation of design into one standard produced by only a handful of factories. Great care must be taken so that budding makers will be encouraged to contribute to this end.

Instincts tell me that it might be more fruitful if the focus of any reviewing were not specific to one maker's work, but rather, an exploration of historical evidence and the encouragement of builders to move towards utilizing more historical exactness in their designs.

There is a disquieting trend amongst my own community of builders which has nothing to do with finding makers unable to build useable instruments, but much to do with an unwillingness on their part to rid early instruments of the influence of the residual preconceptions and expectations cast by the shadow of the modern bassoon. Both of these influences have come to determine how many reproduction instruments sound and respond, which then cascades on into expectations of how other reproductions should also sound and respond. I perceive the market pressure of this trend as only getting worse because we are now seeing more and more players less interested in looking closely at period performance sources than in making as smooth as possible the transition from modern to early instruments. In many cases the motivation has more to do with earning a living, given the declining modern orchestral market, than with the spirit of artistic achievement. This cross-over / band-wagon effect is creating a market pressure to water down the distinctive 'ancientness' of instrument design. Instead of stressing the differences between modern and early instruments it seems we, players and makers alike, are trying to create more similarities. This is the antithesis of what has guided period performance to date and as it continues to accept more modern mannerisms it will eventually engineer its own demise simply because there will no longer be enough perceptible difference between the two. This would be a regrettable loss because, as an experimental art movement, it was founded on a secure foundation intent on reinvigorating period music (Indeed, the music of all periods.) by
discovering new forms of expression and sound based on reconstructing past performance practices through the utilization of each period's technology, social context, and written sources. I, and those who taught me, have always assumed that anyone attempting historically enlightened performance should understand this as a fundamental principle. It is only through the understanding and application of these guidelines that one can then begin to apply this to the music with the energy, style, skill, and musicality needed to bring its spirit to life.

This same philosophy should also underly the reconstruction of musical instruments from the early periods. I'm not convinced that this remains an underlying principle. As a piece of archival material we should consider and utilize original instruments as we would an autographed manuscript. There should be a thorough attempt to accurately measure, understand, and record what evidence was there from the start, what was added or subtracted in subsequent alterations, and how this effected the music that may have been played by that particular instrument. In attempting to reconstruct these instruments we should be adhering as closely as is possible to the original design in order to recreate a comparable tool with which the musician can then reproduce that same effect on the music written during the given period. This of course is an ideal, though unrealistic as this at times may seem, it should still remain one to which each builder should aspire.

Since the time I became interested in the early bassoon in the late seventies I have observed the scene from the vantage of player, maker, researcher, and historian. There are a number of specific problems concerning the reproduction of early bassoons which I've come across throughout this period. There have been many times I've felt compelled to bite my lip over this disquiet for lack of an honourable way to express my dissatisfaction without sounding preachy or envious or poisonous. With the wealth of fine players and abundance of playable instruments available to us now I should feel that we have entered a new golden age of historically enlightened performance of music from the seventeenth, eighteenth, and nineteenth centuries. To a large degree this is true, however I also find myself feeling an increasing sense of hype and falseness accompanying this new form of artistic expression. I'm hard pressed to think of but a handful of reconstructed early bassoons which bear a close enough resemblance to the originals they are copied from. I know of no one who has built and tuned an early bassoon with an historically-based reed design in mind. Is this not tantamount to ignoring the essential nature of gut strings on fiddles? Admittedly, reeds are a nightmare for almost all double reeds from any era, none the less, this remains a crucial problem with the early bassoon because from the outset it determines virtually all of the instruments' playing characteristics. Another inadequacy I see is the widespread ignorance of historical fingering patterns by makers and players alike, in its place one

\footnote{This hasn't quite dawned on Boulez yet.}

\footnote{Though I find much of this distressing, I also want to make it clear that I do not exclude myself from these same pressures or pretend that my instruments don't suffer from some of the same problems.}
finds a propensity to substitute modern bassoon fingerings on early instruments or to impose Baroque fingerings on Classical-era instruments. Fingering charts can be an important written record of the acoustical nature of an instrument. For example, when I tune up a Buhner & Keller copy I know I'm probably getting close to the original when the bulk of fingerings correspond to Ozi's fingering chart. The same should apply between Frohlich's chart and instruments copied after H. Grenser, Grundmann, or Wiesner. In looking further afield to other less careful or misguided practices, it is possible to find many an instrument with Classic or Romantic sized tone-holes on much earlier instruments; thus radically altering and thereby misrepresenting the colour and dynamics of those instruments. Recently I've heard rumours about the application of computer generated bore alterations to early bassoons. Is not the mastering the ancient art of bore correction using spoon reamers a better way to spend time and a skill which will yield more desirable results in the long run? Are we intent on recreating old instruments or merely disguising something new? On a more sinister note are the bassoons which actually hide the bore of one period instrument under the skin of another. Finally, there are still far too many instances of extra keys being added to instruments of an earlier period. H. Grenser summarized this practice correctly when he declared that a master builder should employ a minimum of keys on his instrument and have jettisoned this crutch by the end of his apprentice days. I could go on and on, crooks, woodwind temperaments, etc... It would seem that now is not the time to point fingers too closely. Is it not better for all of us to pledge to try to improve our use of more period materials and methods in order to rid instruments of 'improvements,' which in actual fact misrepresent the nature of the original instrument? If the point of reconstructing a period bassoon is the creation of a tool which will allow the musician to unlock the still hidden secrets of period repertoire, then how can we, as makers, not dedicate ourselves to persevere in the refinement of the historical accuracy of that tool?

All of which brings me back to the points Ardal made last issue. I am in sympathy with virtually every issue he raises (excepting the completely uncalled for attack on Jeremy's personal integrity). It is clear that Ardal's questions must be kept in the fore of any reviewer's mind. The comments made by Eph and Jeremy, on the other hand, I found equally compelling. I agree with the argument that we, as instruments makers, should not be above either consumer or artistic criticism. In a sense, we are making toasters: albeit hand-made' toasters. Whether commentary can be done with care and respect remains to be seen, given individual temperaments and the pitfalls expressed by last issue's comments. I know from personal experience that I find it uncomfortable to always listen, without defensiveness, to frank criticism of my own instruments. This even when I've asked for these comments with the specific intention of improving my

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7 An Italian professional bassoonist asked me once to retune his original H. Grenser in order to make it play with the same fingerings as his copied Prudent. In checking Frohlich's chart I found the instrument played optimally using those historical fingerings. My only course of action was to refuse the work and encourage him to reprogram his brain to the new patterns, hoping that he would not take the instrument elsewhere to be butchered. It is sad that ignorant and lazy behaviour such as this still exists and undoubtedly results in the continuing destruction of valuable historical evidence.
own work. Yet it is important to force myself to do that on occasion.

If criticism is to continue I lean in the direction of a form which would focus on what one should expect from instruments from a specific historic period, rather than on which specific copies fail to live up to this ideal. We can alter the market through access to historical information. In educating the buyers about what to expect and what questions need to be asked, it is hoped that makers will then take the cue from this and work toward improving their own copy's historical accuracy.

Paul White

FoMRHI Comm 1000
Re: Comms 981 and 982

Peter Bavington

This is to say how astonished I was at Ardal's objections to reviews of the Aulos instruments in FoMRHIQ. As a non-specialist I found them interesting, and I cannot see that the ethical considerations are in any way different from those that apply to reviews of books or performances.

In my view there are two criteria to apply to all reviews:

(1) The author or maker should have explicitly or implicitly consented to his work being reviewed; and

(2) He should be offered a right of reply in case of allegedly unjustified adverse comment or factual errors.

Provided these criteria are satisfied, let criticism be free and forthright.

May I comment on the related question of whether you and Eph should be allowed to comment on FoMRHI Comms in the same issue as they appear. I was not a member at the time of the incident which gave rise to this rule, but I believe it arose because a contributor was upset to find, when he opened his Q, that it contained not only his Comm but a vigorous criticism of it by the then editor - quite a shock if you're not expecting it. I suggest that there is no objection to contemporaneous comment by the Editor/Hon. Sec. provided that the contributor is aware that it will appear and has been offered the opportunity to defend himself (or withdraw).

Let's be at least as robust about this as the cautious and scholarly Galpin Society. In this year's Journal (pp. 199-201) there is a vigorous criticism by one member of the restoration methods of another, and an equally vigorous reply by the restorer. (As it happens both are also members of FoMRHI - John Barnes and Richard Maunder). It is only when such controversies become personal that they generate more heat than light: but even then I'd be in favour of free comment.
Should FoMRHI continue or not?
Further to comm. 966, 967, 981 and 982

It is, in fact, not common to review musical instruments - but why not? We have to note first that there are 2 kinds of reviews:

1. books, LPs, cars, washing machines etc. - objects that come in series, so the review's point is to give a description as objective as possible in order to facilitate a likely buyer's decision, and

2. unique things such as concerts or single constructions of musical instruments, the intention of the review being to help the listener to understand what he has heard or what he might expect from a performance.

The reviews of the Aulos instruments by Jeremy Montagu and Lewis Jones clearly belong to the first category as these instruments come from a manufactured series. By the way, these reviews were absolutely legitimate since Mr. Toyama was, on request, willing to send the instruments (3 items each) to Jeremy Montagu for reviewing; Mr. Toyama said that any "suggestions and advice will be much appreciated". Jeremy Montagu's rhetoric question "Now who will do the same thing with viola and lutes?" is superfluous because these instruments are not made in series, but as single copies (in most cases, anyway). Moreover, the general practice with a review of the first category - that the reviewer may keep the book or LP under review (not usual with the other objects in spite of big issue because of high price) - does not apply to instruments coming under review 2) because of their high value and their character as single copies.

Ardal Powell does not enter into a discussion of the reviews really but rather develops something like philosophical thoughts or ethics about reviewing - and he wants to see these restricted to musical instruments only ("rather different from those questions which confront a reviewer of books"); he does not realize the principle difference between review 1) and 2) and therefore gets hopelessly mixed up.

Jeremy Montagu, for his part, would have been well advised to keep to the agreed "rules and practices" (he has rightly told off other people when they didn't - including myself). Then he would have thought over the matter thoroughly and wouldn't have bent the bow too tight in the first zeal. Ardal Powell has missed the nucleus of the reviews by Jeremy Montagu and Lewis Jones, and Jeremy Montagu has missed Ardal Powell's ideas: instead of arguing about Powell's letter he has given a review of the reviewer (Powell). Is that the right way to solve problems? Jeremy Montagu's final question "Should FoMRHI continue or not?" is the wrong question really. I'm afraid the appropriate question would rather have been something like: "Should this style of treating each other continue or not?" A little more prudence and discretion would certainly make the world of FoMRHI a bit brighter.

Uta Henning
Jeremy and I have found ourselves on opposite sides of various questions in the past and have managed to get on quite without acrimony. But I see I touched a raw nerve with what I said in Comm. 981 about FoMRHI's reviews of musical instruments. The criticism I made (last paragraph) was voiced explicitly, and I tried as hard as I could to support it reasonably, but it was in no way intended as a personal attack on anyone. As it happens I have nothing but the highest personal and professional regard for Jeremy, who I think does a fine job of editing the Q., reading all sorts of books and writing reviews on them for our benefit, and contributing to discussions on various subjects. Perhaps this would be a good time to put on record my admiration for his immense knowledge, his mental quickness, his generosity, and his openmindedness.

With the greatest respect, I am unable to agree with him on all the points he made in Comm. 982. I am confident I can express my differences of opinion without causing offence, and I am happy that FoMRHI exists as a forum for doing this.

Jeremy says his anger towards me stems essentially from two points he read between the lines of Comm. 981, but which I did not actually say, and from another remark which I did make there. The first of the inferred slights is the question about his honesty and probity, which I am very sorry came up and which I sincerely hope is cleared up for good. The second is my "implicit" attack (Q.60 p.18 foot of col.2) on the peer review process. But I neither made nor intended one—if such an attack is really an inescapable consequence of the questions I raised then I may be guilty of naivete for not realising it. But Jeremy knows I do not go in for subliminal suggestion all that much. A fault of mine is a certain plodding bluntness: I do not know any more effective way of communicating my thoughts than to speak them plainly, as well as I can.

I have to admit that Jeremy is right about the absolute philosophical idea of a musical instrument review. I can see no inherent objection, if it is stripped down to its bare bones, to the concept itself, divorced from all practical considerations. But just because the concept can exist in our minds does not necessarily mean that it can exist in the real world or that we are bound to try to make it incarnate in these pages. My questions, which there is no need to repeat, are basically all to do with the merely pragmatic problems of reviewing "historical" instruments and publishing the reviews in the Q. for members of FoMRHI to read. I do not understand from Jeremy's Comm. what, and to whom, the benefits of these reviews are in the first place, though I do take his point about the purely intellectual satisfaction to be gained by saying that a review is a review no matter what it is of.
As I see it, as soon as one starts to figure out exactly how the process of writing reviews would work with historical musical instruments, the apparent self-evidence of the idea (that a review is a review...) starts to show signs of strain. Perhaps this explains why other kinds of reviews are common, but reviews of musical instruments do not seem to have caught on—though of course the ancient Greeks had just as much opportunity to develop them as they did the time-honoured theatre criticism which Jeremy cites.

Jeremy quite rightly says that authors, composers and musicians are all used to being reviewed regularly. But I wouldn't call those who do the reviewing exactly their "peers"—they are for the most part journalists (you now need a degree in Musical Criticism to get a job as a reviewer on some papers), not authors, composers and musicians. Sports writers may indeed be assigned, in the lowest manifestations of journalism, to review concerts; but I think we may be allowed to aspire to standards better than those.

The idea of "peer" review as I understand it rightly belongs to scientific disciplines. There, experts in one field or another read the work of their colleagues to make sure it is sound stuff. Perhaps this is the closest to the kind of review Jeremy wants—but our discipline (as has been emphasized in recent controversy) is not a scientific one with agreed rules or certification, and in the absence of these there is bound to be conflict between different views (and I do not wish to decide here whether or not this is a bad thing). These conflicts cannot be adjudicated in practice by anyone other than Jeremy, and since we (instrument-makers) are not used to graciously putting up with the ignorance and malice that Jeremy tells us are common in reviews, unresolvable and acrimonious disputes are bound to arise as the price of these reviews.

Book reviews have the outstanding merit that they save you having to read the book to find out (roughly) what it contains, and perhaps whether it is worth buying. Books are cheap, numerous, identical, and contain ideas encapsulated in words (which, though it is not always easy, people are used to talking about): in all these ways they are different from the instruments most of us make, though in some ways they resemble mass-produced ones. I have no quarrel with FoMRHI's book reviews: on the contrary they seem to me fine and very useful. I think Jeremy is on the right track when he says that reviewing the Aulos flutes is a different case from reviewing other instruments (Q.60 p.18, col.2), because they (the Aulos ones) share some of the characteristics of books; but of course that means the argument for reviewing those instruments would not apply to most of those made by FoMRHI members, and therefore that, though reviews of the Aulos flutes have appeared in the Q., no reviews of other instruments can be justified on the same grounds.

The one thing that set Jeremy off which I did actually say (Q.60
p.19 col.2) was to ask how reviewers might be chosen. I intended to pose the question in as general a way as possible, so as not to rudely appear to question the qualifications of Jeremy and Lewis Jones, who had actually done reviews (Comms. 966-7): I apologise to them for appearing to do so despite my efforts. As I mentioned, I found myself in agreement with most of what they had to say, and I would not like to claim that I could have written anything better myself, especially given my uneasiness about the whole exercise. But if "anybody who has looked at an instrument" (Q.60 p.19 col.2) may write a review for FoMRHI, I can't help wondering what the point or the usefulness of the review might be. Most of us, after all, are specialists to some extent, and read the Q. to learn the views of those who are on the same wavelength, or even a higher one.

The actual criticism ("hasty and imprudent") I made of Jeremy's actions in Comm. 981, and which I regret I have to repeat here, is that he made an error of judgement in unilaterally instituting the publishing of instrument reviews without consulting the members of FoMRHI first, by, for instance, throwing the topic out for discussion in a Bulletin. Perhaps those words are strong—but even if I am considered to have been excessively sensitive or even wrong on every other point I have raised, I believe this one to be proven by the following consideration: if we had been allowed to discuss the idea of reviews before any had been published, we would more easily be able now to debate the subject without the argument tending to get personal.

Can't FoMRHI continue exactly as before—without musical instrument reviews? They are surely far more trouble than can be justified by their usefulness to anyone who has so far been named or that I can think of. They would be bound to be grossly unfair to some individual members (included or excluded), and would therefore cause unnecessary strife in our small community. I have no problem with makers making more or less informed comments on each others' work in print if they wish, but I do wish to express my continued objection to the formal institution of instrument reviews here. I am a member of FoMRHI because it is a unique and traditionally (for the most part) friendly forum for makers to share their views, or historical or technical information about their craft—and that is not something you see writers doing in the New York Times Book Review for instance.

Furthermore I do not wish to see the "revenge" reviews that Jeremy assures us are "all part of the game" appear in these pages and I think it would be a shame to change what we do here to fit in with that style of behaviour just because people are obliged by unfortunate precedent to go along with it in other fields of activity.
"FIXING" THE BAROQUE FLUTE

Die reine Stimmung von einem Tone zum andern, kommt auf einen festen und sichern Ansatz, und auf ein gut musikalisch Gehor an; auch daß man die Verhältnisse der Töne wohl verstehe. Wer bey dieser Erkenntnis die Flöte auch zugleich gut spiele, der ist im Stande, eine gute und reingestimmte Flöte zu machen... Es ist demnach ein großer Vorteil für einen Flötenspieler, wenn desselbe die Einsicht selbst Flöten zu verfertigen, oder wenigstens abzustimmen, besitze.

"Good intonation from one note to the next depends upon a firm and secure embouchure, and upon a good musical ear; and one must have a good understanding of the proportions of the notes. Anyone who in addition to this knowledge can also play the flute well is qualified to make a good and well-tuned flute... Hence it is a great advantage for a flute player to possess the understanding himself to be able to make flutes, or at least to tune them." [Quantz, Verruch IV,4, my translation]

The most memorable and quotable part of this passage, best known in Edward R. Reilly's slightly less emphatic version, goes as follows:

"it is most advantageous for the flute player if he knows how to make flutes himself, or at least how to tune them." [On Playing the Flute, p.30]

It is easy to overlook the "firm and secure embouchure", the "good musical ear", the "good understanding of the proportions of the notes", and the necessity of being a good player; but everyone will notice that Quantz seems (in the shorter quotation) to be making the delightfully liberating suggestion that all flutists may make, or at least tune, their own instruments. And it seems to be from a confused interpretation of this passage that some players who are not too well up on their history have been known to maintain, against reason, common sense, and the author's message, that it is better if makers are not themselves players. Surely Quantz did not mean flutists who fall short of his criteria to take matters into their own hands and try home-made "fixes" on their instruments? I think it's only necessary to read the passage as a whole to see that quite clearly.

Similarly, Lewis Jones's description of experimental modifica-
tions of the Aulos Stanesby Junior traverso to improve its playing qualities, in what was supposed to be a review of the instrument (Comm. 967), was unquestionably not meant to encourage widespread application of those techniques to more expensive wooden instruments.

But just as I know cases exist where the quotation from Quantz above has seemed to sanction butchery of handmade baroque woodwinds, I am afraid that Lewis Jones's remarks may—though he probably acted in all innocence and did not intend this result—encourage cases of irresponsible behaviour too. Incidentally, the example worked on as described in Comm. 967 was not the reviewer's property—making any alteration of it for any purpose highly questionable.

There are a number of simple maintenance operations that a traverso or recorder player should be able to perform for him- or herself: tenon winding, cork (plug) removal and greasing, oiling, key and keyway cleaning among them. There are others, having to do with the way the instrument plays, that are equally simple for the owner to do, but which for various reasons are best left to the maker. Edges of various degrees of sharpness, for example, do actually exist on a lot of eighteenth-century woodwind instruments, and it could be just as unfortunate to remove them in some cases as to leave them unrounded in others; though Comm. 967 might unintentionally give the impression to anyone who did not know better that sharp edges are a sign of the maker's incompetence, and that it is always essential to remove them. The decision ought to be the responsibility of the maker because a certain amount of skill (= risk of failure) may be involved—actually rounding the interior and exterior edges of a tonehole can be done in a hundred different ways: with a file; with a scraper; with a knife; with a fraise or countersink; with any number of different grades of sandpaper or steel wool; with several different kinds of buffing compound; by chamfering at any angle between 1 and 89°; by rounding an equal amount all round; or by rounding more at the top and bottom. Without experience in these matters or practice in handling the tools, how can a player know which route to take to get the desired results? An indeed why should he or she be troubled with such details?

Perhaps the urge to "improve" lies within everybody and needs to be actively resisted—unless one wishes to develop it by rather systematic and thorough study. Relying on native instinct, anyone can take whatever tools are handy and enlarge holes or bore dimensions in the hope that certain results will ensue (it is much easier to take wood away than it is to add it: the instrument-maker's art consists in knowing when to stop). But in the worst imaginable case, the instrument will be totally ruined: and
if the player didn’t like it in the first place and has not considered asking the maker for a refund, the lost cash value of the unusable instrument will be the high price paid for a failed experiment and a little experience!

It’s my idea that modifying a wind instrument is best left to the maker, because he or she can be presumed to have at least some experience of how that particular instrument works and what modifications might be successful. Lewis Jones brings up the question of whether or not all makers may have the necessary competence: there are really quite a number of good makers (and player/makers) around the world today, but I’d say even a relatively inexperienced one may perhaps have a better chance of success than a player working on instinct alone—in the only case I can envision where this would not be true, I have a hard time imagining why a good player would be using an instrument by such a duffer in the first place! Getting hold of a good instrument is no easier now than it was in 1752: being, as it is, a matter of balance between all the design-elements, it is rarely if ever possible to make a good flute out of a bad one by altering just one of those elements. Nevertheless an instrument that seems quite satisfactory when one is a beginner may only begin to show its limitations after a few years’ study. So what (players may ask) should one do if one finds, or even only suspects, that one has a bad instrument on one’s hands?

My theory is that a much better way to deal with an unsatisfactory instrument is not to waste time trying to improve those which are poor, but to ask the maker to provide this service—as most do already. A player who is dissatisfied with an instrument he or she has bought can, of course, just get rid of it at any time for cash, and keep looking for a better one. But he can also return a new instrument in a timely fashion to the maker for adjustment (even mass-producers of low-cost instruments do not like to have dissatisfied customers) and be free of responsibility for the outcome. On the other hand if home-made alterations are performed he will be stuck with the result for better or worse—and from my observations I’d say worse is far more likely.

Many quite simple actions can ruin an instrument: it only takes a second, and an experienced maker is perhaps only a little less prone than anyone else to the momentary slip that can spoil a good flute. Even if a player thinks the solution to his instrument’s problems is perfectly obvious and straightforward, there is still a chance he is mistaken and that the maker will see a more efficient method of making the desired alteration. And if he is right, why should he jeopardize an expensive instrument in order to put his theory to the test, by performing a task that even a moderately handy maker could do easily and without risk?
THE SORDUEN-BAS

The purpose of this note is to consider the identity of the instrument depicted as fig. 1 in Plate X of Praetorius' Syntagma Musicum II. The legend to the plate describes it as a "Sorduen-Bas", the pitch being stated as GG. Twentieth-century writers seem to take this instrument to be a sordun - i.e. a reed instrument (without wind-cap) having a cylindrical double bore; Munrow reproduces the illustration along with the four sorduns of Praetorius' Plate XII, fig. 8 as a "consort of sorduns", whilst Crookes in the footnotes to his translation of Syntagma Musicum II states that it is sordun no. 1 of Praetorius' pitch chart on page 38 (all page references are to the Crookes translation).

I believe that this assumption is seriously open to question, inter alia because it can only be valid if a substantial part of the information given by Praetorius is, in fact, wrong.

The information given on sorduns may be summarized as follows (in this Comm., all dimensions in feet and inches refer to Brunswick feet and inches as used by Praetorius):

(a) The lowest sordun is 2'3" long. (p.49)
(b) The lowest sordun is hardly half as long as the double curtal. (p.49)
(c) The GG double curtal in Plate X:2 is 4'9" long. (Scaled from plate X)
(d) Four sorduns have the dimensions shown by the scale in Plate XII:8. Referring to them as (left to right) P, Q, R, and S, their lengths, to the nearest inch (without reed or staple) are:

- P - 11"
- Q - 1'6"
- R - 1'11"
- S - 2'5"

(e) There are five sizes of sordun. (p.29)
(f) Their ranges are: no. 5 (Cantus) : Eb - g'
    no. 4 (Ten/Alt) : Eb - c'
    no. 3 ( ) : C - a
    no. 2 (Bass) : BBb - g
    no. 1 (Gr. Bass): FF - d. (chart, p.37)

(g) Plate XII:8 is "Ein ganz Sitawerck von Sordunen" - a whole consort (?) of sorduns.

(h) The lowest sordun descends as low as the double curtal. (p.49)
(i) There are two kinds of double curtal, with bottom notes GG and FF respectively. (p.48)
(k) The largest of the sorduns in plate XII has a compass from F to d'. (The fact that the d' is not adjacent a fingerhole indicates that, in this Figure, the notenames are written against the lowest hole that needs to be closed to sound that note.) (Plate XII:8).

Examining the consistency of this information:

(i) Dimensions
   - Statements (a), (b) and (c) are mutually consistent.
   - Statement (d) is, as far as instrument S is concerned, consistent with (a), (b) and (c) provided one is not too fussy about the 2" discrepancy, and leads one to conclude that S is the lowest instrument.

(ii) Number of sizes
   - Statements (e) and (f) are mutually consistent.
   - Statement (g) is consistent with this on the basis that one would not expect to find the C bass and the BBb bass playing together.
(iii) Pitch

- Statements (h) and (j) tell us that the lowest sordun has lowest note FF or GG. This is consistent with the pitches given in statement (f). It is also (despite the doubts expressed by Praetorius himself) consistent with the well known fact of acoustics that a cylindrical bore instrument will sound an octave lower than an instrument of the same length having an expanding conical bore.

- Statement (k) tells us that instrument S (which, from statement (d) is 2'5" long and therefore, from statement (a), the lowest) has lowest note F, which is inconsistent with the above. This leads to the inescapable conclusion that one statement (at least) is wrong. Statement (k) is the most obvious candidate since there is no F instrument in the pitch chart and indeed four of the five instruments in the chart are pitched lower than this. Moreover, we know from our own observation (see below) that a sordun of the length shown will not in fact sound at the pitch indicated.

(iv) Pitch v. Dimensions

- I will now attempt to establish the relationship between the five instruments given in the pitch chart and the four shown in Plate XII. I believe it is obvious from an inspection of the chart, or of the dimensions taken from it and given in statement (d) above, that no two of the instruments depicted are of sufficiently similar length that they might be supposed to sound only a tone apart; and that therefore one or other of instruments 2 and 3 of the chart is missing from the drawing (see also the last comment under (ii) above). However it may be helpful to attempt a more rigorous analysis.

- My approach is to estimate the acoustic length of each instrument when playing its lowest note and from this calculate the interval between them. I take the length to be the distance from the reed tip to the plug, plus one third of the body diameter (for the join between bores) plus the distance from the plug to the effective end of the instrument, which I take to lie half-way between the vent hole and the top of the body. I appreciate that this is somewhat crude, in ignoring differences in bore diameter and reed width, and the fact that the effective length of the reed will not be the same as its physical length, but suggest that the consistency of the results shows that the estimate is accurate enough for present purposes.

- Lengths are as follows. They are given in millimetres using the conversion factor of 23.78 to the Brunswick inch quoted by Crookes.

<table>
<thead>
<tr>
<th>Instrument:</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
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</thead>
<tbody>
<tr>
<td>Sounding Length:</td>
<td>489mm</td>
<td>792mm</td>
<td>1052mm</td>
<td>1392mm</td>
</tr>
<tr>
<td>Interval (cents):</td>
<td>834</td>
<td>491</td>
<td>485</td>
<td></td>
</tr>
</tbody>
</table>

If we round the intervals to the nearest semitone we get an interval of a fourth between S and R and between R and Q, and an augmented fifth from Q to P. If we pitch instrument S at FF then we get (with pitches given as equal temperament with cents offset shown following the note name):-

<table>
<thead>
<tr>
<th>Instrument:</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch:</td>
<td>B+10</td>
<td>E♭-24</td>
<td>BB♭-15</td>
<td>FF</td>
</tr>
</tbody>
</table>

Comparing the pitches from the chart:-

<table>
<thead>
<tr>
<th>Instrument No.:</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch:</td>
<td>B♭</td>
<td>E♭</td>
<td>C</td>
<td>BB♭</td>
<td>FF</td>
</tr>
</tbody>
</table>

- which corresponds except for a semitone error in no. 5 and errors of less than a quarter of a semitone on nos. 2 and 3; surprisingly good agreement in view of the crudeness of the calculation. Praetorius' pitches are stated (p.35) as being at chamber pitch which Crookes (footnote 88, quoting Baines) puts at around a'=440Hz; about a semitone sharper than modern pitch. An experimental instrument which I have made has an effective length (on the above definition) of 783mm (only very slightly shorter than instrument Q) and sounds at about F(a'= 440Hz) which is equivalent to E(a'=470), thereby confirming the above conclusion to within a semitone.
Thus I conclude that all the textual information concerning sorduns, and Plate XII:8, are consistent, except for the notes marked on the Plate, which are an octave too high.

What, then, is the sorduen-bas (sic) of Plate X?

Crookes, in footnote 102, assumes that this is no 1(FF) in the pitch chart. In order to reconcile this with the GG indication on the legend to Plate X he assumes that the pitch chart is expressed at choir pitch (a'=420), despite Praetorius' clear statement on page 35 that chamber pitch is used throughout. He then deduces that the sorduns are:

Plate X  = no. 1  @ GG (choir)  = FF (chamber)
Plate XII: S = no. 2 or 3  @ C or D (choir) = Bb or C (chamber)
R = no. 4  @ F (choir) = Eb (chamber)
Q = no. 5  @ c (choir) = Bb (chamber)
P = not in chart  @ g? (choir) = f (chamber)

It seems clear that this conclusion is untenable. It assumes too many mistakes on Praetorius part; namely that not only statement (k) but also statements (a), (b) and (e) are incorrect, as well as his statement that he uses chamber pitch. Moreover it is not consistent with the writer's own experiment, which suggested that Q would be around E rather than Bb. Most significant, however is that Plate X shows the sorduen-bas (fig. 1) as being essentially the same length as the double curtal of fig. 2, and, like the latter, having a pitch of GG. This however is acoustically impossible since the cylindrical bore must necessarily sound an octave below the conical one. I will proceed to address the question of the identity of the Plate X instrument on the basis that the pitches of the instruments of Plate XII are as I have concluded above.

There is no obvious reference in the text to this instrument: what do we learn from the drawing itself?

(1) It is a double-bore instrument. This is obvious from the disposition of the fingerholes and keywork and invites little additional comment.
(2) It is 4'6" long. I have considered the possibility that it could be half this length - i.e. the length of a GG sordun, but - apart from seeming an unlikely mistake - this possibility can be rejected because the length of the crook (nearly 25% of the length of the body) would be excessive for such a small instrument.
(3) Its lowest note is GG. There are one or two discrepancies here, in that the practice of using upper and lower case letters, where appropriate doubled or under/overscored, to indicate the octives, has not been followed (nor is it followed in the curtals of figs. 3 and 4). The letters A, B, C, G should apparently read AA, BB, C, G. The second discrepancy is that the last two lines of the legend to Plate X (not reproduced in the Crookes translation) state that figs. 1 to 5 of the Plate have note letters placed against the relevant closed fingerholes whilst figs. 6 to 9 have them shown by the open holes. This would tend to indicate that the lowest note is AA rather than GG; however chasing the odd tone is perhaps premature before considering which octave it sounds! The fact is, that if it is a sordun 4'6" in length then its lowest note will be an octave lower than the double curtal of the same length, namely GGG. If this is taken at a'=470 then it corresponds to AAA(a'=440), i.e. 27.5 Hz. This is the lowest note on the grand piano and a semitone below a modern contrabassoon. Whilst not inherently impossible, such an instrument, if it existed, would be the lowest pitched woodwind ever made (to the best of my knowledge). When one considers that the lowest pitch quoted by Praetorius for any woodwind is CC (for the octave sackbut, p.35 and great bass rackett, page 38), and the emphasis he gives to the proposal (p.48) for a contra-curtal going down to CC, I suggest that if he knew of an instrument capable of playing as low as GGG he would have mentioned it specifically.
Additionally - given the conclusions drawn above - for the sorduen-bas to be a GG sordun is inconsistent with statements (a), (b), (e) and (f), as well as with the pitch given on the legend to Plate X itself.

Thus we have a double-bore instrument with a body 4'6" in length playing GG. I am unable to escape the conclusion that this is not a sordun at all but has a conical bore and therefore is a type of curtal. The only evidence of this instrument being a sordun is the name Sorduen-bas, which is fairly tenuous, bearing in mind inconsistencies in usage of terminology generally, and the reference to the curtal in fig.7 of Plate X as Kortholt.

The proposition that this is a curtal is consistent with the pitch and length given, and with the observation that it is a double-bore instrument. Considering other features of the illustration, the instrument seems, unlike the other curtals, to have a circular external cross-section. There does not seem to be any reason (other than increased weight) why one could not make a curtal with a circular cross-section. Interestingly, the curtal depicted in the fresco "Adoration of the Shepherds" in the church of S Luca, Genoa, reproduced by Grove* ("Bassoon, sec. 3") seems - though it is hard to be sure - to be circular over most of its length. Also it has a flared lower end as does the sorduen-bas. The latter also has a flared upper end, suggesting a bell; to be expected on a curtal but not on a sordun. If it is a bell then it is partially obstructed by the crook which disappears into it and one may conjecture that the final part of the bass bore deviates (as on some gedackt curtals) from the circular by having the wall of the treble bore protruding into it.

Finally we ought to consider the finger holes (I use this term to include holes operated by keys). Normally on a curtal we expect seven holes on the front of the instrument, and three on the back. Certainly the sorduen-bas has seven on the front. On the back we see a hole controlled by the upper key, marked A, and a lower key marked B and C. On some reproductions of this drawing, but not others, there is a mark adjacent the C which might just be a second key protruding from the same key cover (or possibly a finger hole). It is possible to imagine that beneath the cover there are two key flaps at positions coinciding with the two sets of holes in the cover itself - though I admit that this is not conclusive.

I should be most interested to hear the views of others on this question.

References:
1. Praetorius, M, Syntagma Musicum II: de Organographia,1618/1619
It's taken me quite some time to reach certain conclusions. I suspect that the experts knew them, or something like them, all along (experts tend to assume that everyone else knows what is so familiar to them, and to go on from there). Because these ideas don't appear in many books yet, I thought I might recapitulate the way I got to them — and if I've got a few things wrong then, with luck, someone will put me right.

I'd made some "renaissance" flutes drawing on the Mersenne information in Rockstro, and on Trevor Robinson's GSJ article (GSJ XXVI) on his reconstruction, and they seemed to work reasonably well with the first Mersenne fingering chart (again as in Rockstro). So when I came to use the measurements of some Verona flutes given by Piladelfio Puglisi in GSJ XXXII, I got something of a shock and had to find other fingerings.

At this point, a Bate weekend on Renaissance flutes master-minded by Lewie Jones gave me a major (to me) step forward. Lewie provided some Jambe de Fer information, showing that the basic sequence of notes on the bass flute was, for Jambe de Fer, re, mi, fa, sol, re, mi, fa, sol, re, mi, fa, sol. Although fairly baffled by Morley's Plaine and Easie Introduction, I thought these looked like the notes of the hexachord. Since the notes of the hexachord are separated by whole tones except for mi/fa, the basic sequence of notes of Jambe de Fer's bass flute were G A B C D E F G A B C D E F

If one assumes that the same goes for his tenor flute, then the notes are D E F G A B C E F G A B C. The third note of the sequence is then Bb or F and not E or F sharp. If the Verona flutes were tuned accordingly, this would explain a lot (I still take it, obviously, that a cross-fingering ....O. is used). The bass flute, incidentally, would seem to use natural and soft hexachords, and the tenor natural and hard.

The Agricola fingering charts also use the hexachord, mi/fa denoting the semitone intervals — except at the top end of the bass flute, where re, mi, fa, sol, la is given as equating to g a b b c c d d, apparently putting a semitone between a a and b b (or was this meant to be a Bb?). In the 1528 chart, incidentally, the instruments all start on re, but the bottom note are ♭ (descent), a (tenor/altus), and d (bass), and only the natural and hard hexachords are used.

A musical instrument provides a number of notes which can be used by composer and player. There would seem to be no essential reason why the lowest fingering should correspond to the doh of a scale or mode. And from the foregoing, it is beginning to seem to me that to speak of the Renaissance flute proper as being "in D" is misleading. On the other hand the positions of the semitones seem appropriate for the Dorian mode (see also Kathleen Schlesinger's article in the Encyclopedia Britannica) or the Hypomixolydian, for that matter, transposed as need be.

Having worked through the foregoing, I was a bit chagrined to find some of it (and some differences) in Raymond Meylan's "The Flute" (Bateford), and more of the same in Piladelfio Puglisi's article in GSJ XLI.

Why, then, do I think I was misled by Mersenne? Because I thought he was describing the Renaissance flute proper. But if the
Verona (and similar) flutes are truly of the Renaissance - and they could well be quite a lot older than Mersenne's, then the one he described is something else. In particular, if Rockstro and others are right in interpreting the F in his first fingering chart as an F sharp (can anyone explain the second chart?), then this flute can be thought of as being in the scale of b. This links up with the chart's similar fingering in each octave, made more practicable by finger holes much larger than those on the Verona flutes.

It seems to me very possible that the flute described by Mersenne is a response to musical requirements different to those met by the Verona flutes. And one moves on from that to flutes like the one described in GSJ XXXVII by Mr Puglisi, which might be seen, as he, indeed, implies, as linking Mersenne with the more fully developed three-joint pattern.

That just about wraps up what I think I know about Renaissance flutes. I would be very grateful for comments and criticism.

IVORY ALTERNATIVES

For the past ten years I have used a modified wood for key covering - hornbeam which has been impregnated with polyester resin. I do not regard this as a substitute for ivory but as an alternative and, in fact, prefer it for appearance and wearing quality to ivory. I use it for covering naturals but it would be equally suitable for sharps and may well have other uses. Hornbeam is our hardest and whitest wood and the polyester increases the hardness and colours it slightly. The colour is pale coffee cream with pleasant grain marking. It is extremely hard and difficult to work and is best cut with a tungsten carbide tipped saw blade. Too hard to plane, I clean it up with a scraper, sand down and polish with rubbing compound, a tripoli polish sold by motor shops for finishing cellulose paint. This, incidentally, is excellent for polishing old ivory keys. The material is made by The Lignastone Company, Church, Accrington BB5 4ST, telephone 0252 - 33111, who apparently developed it for loom shuttles.

A year or two ago, a Comm recommended milk casein plastic as an ivory substitute. I have no personal experience of this but I have a recollection that it was used pre-war on cheap pianos as an ivory substitute for key covering, but dropped as it absorbed dirt in the way boxwood does.
How to design a recorder

When visiting "Deutsches Museum in München" years ago, I saw an antiquated ruler of bronze on which three different linear measures were engraved. At that time I wondered what the ruler had been made for. For merchants travelling across the numerous small states of ancient Germany the knowledge of different long measures was really necessary. It is possible that also craftsmen took advantage of this invention.

Such a triple rod is an instrument that fascinates a maker of woodwinds. He is expected to make recorders of different size and to construct alto recorders of different pitch for his customers all over the world. Always using the same foot-rule he will certainly miss the opportunity to employ ideal numeric figures which are indispensable for proportional thinking. Thus we may suggest that makers of woodwinds who worked in different European places had a good command of how to handle foreign rulers. Take this example into account: the Burgundian Peter Bressan made woodwinds in Paris as well as in London. Which was the foot-rule he made use of? The analyses of three different recorders all made by Bressan may enable us to find an answer to our question.

A.

In the Collection Frans Brüggen exists a recorder in f which is proportioned according to the Pied de Bourgogne (331.2 mm). The sounding length of this flute (450.8 mm) is exactly 16 1/3 Pouce or 196 Ligne whereby the ligne is identical with the module. The kind of proportioning employed here

\[
\begin{align*}
\text{head : (centre+foot)} & : \text{sounding length} \\
h & : (c + f) & : \text{SL} \\
13 & : 15 & : 28 \\
91''' & : 105''' & : 196'''
\end{align*}
\]

is deduced from the equilateral triangle. In this case Bressan made use of the very ancient approximate value 13:15, often applied in Renaissance architecture and derived from a specific right-angled triangle that already Plato had estimated to be the most beautiful. \(^{(2)}\)

\[
\begin{align*}
13 & : 15 = \sqrt{13} : 2 \\
0.8666 & = 0.8660 \\
28 & = \text{numerus perfectus} \\
196 & = 28 \times 7
\end{align*}
\]

B.

Another recorder in f' (drawn and measured by Jean-François Beaudin) is in possession of "Stiftung Preußischer Kulturbesitz Berlin" (2801). This instrument - somewhat shorter (445.6 mm) - is disposed according to the French Aune ("ancienne mesure de longueur" = 1188.35 mm): 3/8 Aune! Bressan preferred 216', so did Thomas Stanesby sen., when designing a recorder in f'. Both created a 1 1/2'-flute, Bressan using a French Pied, Stanesby the contemporary English foot. And these are the different schemes of proportioning:

Bressan (Berlin 2801)  
\[
\begin{align*}
17 & : 19 & : 36 \\
102''' & : 114''' & : 216'''
\end{align*}
\]

Stanesby sen.  
\[
\begin{align*}
25 & : 29 & : 54 \\
100''' & : 116''' & : 216'''
\end{align*}
\]
very old approximate value used by early architects. Once more the theorem of Pythagoras is applied, again the basis of this triangle is formed by the figure 1, which is so very fundamental according to the sight of the Pythagoreans.

\[ 17 : 19 = 2 : \sqrt{5} \]

\[ 0.8947 - 0.8944 \]

\[ 6 = \text{numerus perfectus} \]

\[ 216 = 6 \times 36 \]

On this occasion we will subsequently add that Johann Heitz when designing a recorder in f' preferred the proportion:

\[ h : (c+f) : SL \]

\[ 4 : 9 : 13 \]

\[ 2^2 : 3^2 : 13 \]

The geometrical model fitting this proportion looks like a further development of Bressan's model.

The comparison of Bressan's recorder 2801 with a model quite similar (measured by Friedrich von Huene and drawn by Günter Dullat) is rather informative. As to measurements and proportioning there are no differences to be found.

<table>
<thead>
<tr>
<th>Measurements according to Beaudin</th>
<th>Measurements according to v. Huene</th>
<th>Results of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>h</strong> 132.55 133</td>
<td><strong>h</strong> 133.68</td>
<td>133.59 133.68 3/10 SL</td>
</tr>
<tr>
<td><strong>c</strong> 210.5 209</td>
<td><strong>c</strong> 210.43 102 1/2</td>
<td>210.43 102 1/2 17/36 SL</td>
</tr>
<tr>
<td><strong>f</strong> 102.7</td>
<td><strong>f</strong> 102</td>
<td></td>
</tr>
<tr>
<td><strong>SL</strong> 445.75 444</td>
<td><strong>SL</strong> 445.63 216 18</td>
<td>445.63 216 18 1 1/2'</td>
</tr>
<tr>
<td><strong>h+f</strong> 235.25 235</td>
<td><strong>h+f</strong> 235.19 114 9 1/2</td>
<td>235.19 114 9 1/2 19/36 SL</td>
</tr>
<tr>
<td><strong>c+f</strong> 313.2 311</td>
<td><strong>c+f</strong> 312.42 MAIOR of TL (7/10 SL ?)</td>
<td>312.42 MAIOR of TL</td>
</tr>
<tr>
<td><strong>1st hole</strong> 277 275.8</td>
<td><strong>1st hole</strong> 275.40 MAIOR of SL</td>
<td>275.40 MAIOR of SL</td>
</tr>
<tr>
<td><strong>TL</strong> 506 505.1</td>
<td><strong>TL</strong> 505.55</td>
<td>505.55</td>
</tr>
<tr>
<td><strong>HEAD</strong> 193 194.1</td>
<td><strong>HEAD</strong> 192.12 minor of TL</td>
<td>192.12 minor of TL</td>
</tr>
</tbody>
</table>
C.
A recorder in d' or voice flute left twice in the Bruggen Collection bases on the Toise ("ancienne mesure valant six pieds"; pied=324.849). The sounding length is 5/18 Toise or 1 2/3' or 20" or 240'". This quantity of units can be proportioned without any difficulty, when applying this kind of proportioning:

\[ h : (c+f) : SL = 3 : 7 : 10 \]

If the geometrical figure that is likely to be assumed here is really the square, \( 7 : 10 = 1 : \sqrt{2} \)

\[ 0.7 \approx 0.7071 \]

Measurements according to Bruggen IV Bruggen V in mm

<table>
<thead>
<tr>
<th></th>
<th>Bruggen IV</th>
<th>Bruggen V</th>
</tr>
</thead>
<tbody>
<tr>
<td>h</td>
<td>162.6</td>
<td>162.8</td>
</tr>
<tr>
<td>c</td>
<td>242.7</td>
<td>242.8</td>
</tr>
<tr>
<td>f</td>
<td>137.4</td>
<td>136.6</td>
</tr>
<tr>
<td>SL</td>
<td>542.9</td>
<td>541.7</td>
</tr>
<tr>
<td>c+f</td>
<td>380.1</td>
<td>379.4</td>
</tr>
<tr>
<td>h+f</td>
<td>300.2</td>
<td>298.9</td>
</tr>
<tr>
<td>h₁</td>
<td>343.45</td>
<td>342.8</td>
</tr>
<tr>
<td>TL-6</td>
<td>613.4</td>
<td>613.3</td>
</tr>
<tr>
<td>H</td>
<td>233.3</td>
<td>233.9</td>
</tr>
</tbody>
</table>

The results of our analysis enable us to reconstruct the genesis of Bressan's voice flute:

a. In the beginning the sounding length is fixed precisely.
b. The sounding length is to be divided according to the pattern 3:7:10 in order to separate the head (blockline).
c. The longer part is regarded as a MAIOR of a section according to divine proportion (13:21:34); consequently the minor is identical with the Head (total).
d. Employing a section according to 9:16:25(Pythagorean Triple) the MAIOR is divided into centre and foot.
e. Follows the appointment of the distance fingerhole \( h_1 \) (9/25 SL).
f. The exact position of the first fingerhole \( h_1 \) is to be fixed, finally the distance \( h_{1-6} \) is to be affixed here.

Thus the longitudinal structure of Bressan's voice flute is fixed!
Summing up our findings we say that Bressan when creating three recorders of different size made use of three different rulers (and geometrical figures!). Maybe he was in possession of a triple ruler?

But there is no denying a contrary remark of Remy Gug:

"The belief that a given early artisan made use of three totally different measurements on the same work is unfortunately a historiographical aberration" (FQ 59r)

D.

Finally when taking a look at a recorder in B flat or fourth flute made by Thomas Stanesby jun. (Bruggen I) we will find out that even this English artisan made use of a foreign ruler. The sounding length of his instrument is (according to Fred Morgan) exactly 661.4 mm i.e. 2 1/3' (Voet=283.56 mm) or 28'' (Duimen) or 336' '.

Why did Stanesby give preference to this (Amsterdam) unit of measurement? I guess the 336 is of such excellent usefulness for proportional thinking that Stanesby did not fail to seize the opportunity of realizing a double proportioned recorder!(4)

\[
\begin{align*}
    h &: (c+f) : SL \\
    7 &: 17 : 24 \\
    10 &: 11 : 21
\end{align*}
\]

Notice furthermore:

**HEAD** : (c+f) : TL

\[
\begin{align*}
    9 &: 16 : 25 \\
    3^2 &: 4^2 : 5^2
\end{align*}
\]

---

**measurements according to Morgan (in mm):**

<table>
<thead>
<tr>
<th></th>
<th>mm</th>
<th>lines</th>
<th>duimen</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>head</strong></td>
<td>193.2</td>
<td>192.98</td>
<td>8</td>
</tr>
<tr>
<td>centre</td>
<td>314.8</td>
<td>315.06</td>
<td>13 1/3</td>
</tr>
<tr>
<td>foot</td>
<td>153.4</td>
<td>153.59</td>
<td>6 1/2</td>
</tr>
<tr>
<td>SL</td>
<td>661.4</td>
<td>661.64</td>
<td>336</td>
</tr>
<tr>
<td>c+f</td>
<td>468.2</td>
<td>468.66</td>
<td>238</td>
</tr>
<tr>
<td>h+f</td>
<td>346.6</td>
<td>346.57</td>
<td>12 2/3</td>
</tr>
<tr>
<td><strong>hole 1</strong></td>
<td>396.8</td>
<td>396.98</td>
<td>14 1/2</td>
</tr>
<tr>
<td><strong>central point</strong></td>
<td>288.475</td>
<td>289.46</td>
<td>12 1/4</td>
</tr>
<tr>
<td><strong>distance</strong></td>
<td>216.65</td>
<td>216.60</td>
<td>9 1/6</td>
</tr>
<tr>
<td><strong>TL</strong></td>
<td>732.4</td>
<td>732.53</td>
<td>31</td>
</tr>
<tr>
<td><strong>HEAD</strong></td>
<td>264.2</td>
<td>263.64</td>
<td>9 25</td>
</tr>
</tbody>
</table>

---

\[
\begin{align*}
    24 \times 4^1/6'' & : 24 \times 4^1/3'' \\
    2^4/3 & : 2^4/5
\end{align*}
\]
Let's stop here and draw a deep breath! Is the relation SL:TL really 28:31 (see above)?

Within the figures 1-100 there are four which are of outstanding quality so called "numeri perfecti" (numerus perfectus = sum of its divisors).

\[
\begin{align*}
1 &= 1 \\
6 &= (1 + 2 + 3) \\
28 &= (1 + 2 + 4 + 7 + 14) \\
496 &= (1 + 2 + 4 + 8 + 16 + 31 + 62 + 124 + 248)
\end{align*}
\]

In which respect is our question linked up with the existence of a "numerus perfectus"? Before creating a fourth flute Stanesby has fixed two fundamental lengths:

\[
\begin{align*}
\text{SL} &= 336 \\
\text{TL} &= 372
\end{align*}
\]

Both statements of size are related to a numerus perfectus!!

\[
336 = 28 \times 12 \\
372 = 496 - \frac{3}{4}
\]

What is the idea behind this? When determining the total length of a fourth flute Stanesby proceeded from numerus perfectus 496 (so did the old monastic architects who built the famous Monastery of Cluny in the 11th century)(5). The sounding length, however, was connected to the numerus perfectus 28 (compare with Bressan!).

At no time Stanesby has determined the essential length of a woodwind in an arbitrary act but has always tried to deduce the main length from higher principles! Perhaps this is the way of thinking employed by all the important baroque woodwind makers.

Provided that our results of measurements analysis are reliable a lot of most different questions arise. Some of them are worth mentioning:

1. Did Peter Bressan who was working in London for 42 years ever make use of the English yard-measure?

2. As far as we know the recorder has never been made with interchangeable centres. Therefore when a special pitch was required, did the instrument maker create a completely new model?

3. Was the definite sounding length necessary in order to correspond with a determined pitch standard found out by the artisan when reflecting on the triple ruler? Did he have a free choice to pick out a qualified linear measure for his purposes? Was the determining factor a quantity of lines most useful for proportional thinking?

4. It is quite difficult to say to what extent in the process of designing a woodwind the instrument maker preferred the drawing method to reckoning. We discovered geometrical basic figures from which irrational proportions have presumably been deduced. Did the baroque makers of woodwinds make use of a mixed method "using arithmetic 'coupled' with ruler and compasses" (Remy Gug)?

5. Results of measurement analysis have shown that recorders made by Bressan and Stanesby are without tolerances at all. Does the longitudinal shrinking of baroque woodwinds practically stand at zero?
What is the good of permanent relating to different kinds of geometrical figures which are fundamentally in connection with the theorem of Pythagoras?

Take into account that these figures are employed twofold: on the one hand they enable us to read proportions or measurements in a very direct way \(2 : \sqrt{15} = 17 : 19; 2 : 3 = 13 : 15\). On the other square numbers which originate from the right-angled triangle form governing proportions in the course of designing
\[9 : 16 : 25 = 3^2 : 4^2 : 5^2; 9 : 13 = 2^2 : 3^2 : 13.\]

What is that supposed to be? So a geometrical figure seems to be in a key position for design and construction of a woodwind instrument. I think the name of this proportion is neither divine nor harmonic but "square proportion" (Flachenproportion).

What kind of advantage did the early craftsmen expect from square proportions? Did the Platonic idea of beauty survive here in any form? Is a rhythmical disposition of the external shape intended? Is it an attempt in the field of sound or acoustics? Are mnemotechnical purposes dominating here?

For what reason did Stanesby sen. and Peter Bressan prefer the numerus perfectus 6 (in the cubical form 6³) for the sounding length of a recorder in f'?

Why did Bressan when creating an alternative recorder in f' favour the numerus perfectus 28 (in connection with the equilateral triangle)?

And why did Johann Heits when designing a recorder that is modelled on the Pythagorean Tetraktys make use of the harmonic proportions 1:2 (Diapason) and 2:3 (Diapente) and 3:4 (Diapente)? (6)

It is impossible to proportion the external shape of a traverso in all the four parts strictly according to divine proportion. August Grenser therefore preferred an internal disposition and thus deduced all measurements excellently from the pentagram! What is the proper reason why he did so?

Maybe that the early master tried to reply to questions of acoustical nature in this way. I believe "the via antiqua" in instrument making was convinced that the beauty of sound results from symmetry i.e. from the right correspondence of the parts of a woodwind. By any means this "right correspondence" had its origin in the cosmos itself.

"Von pythagoräisch-platonischen Gedanken, daß die Harmonie des Kosmos nach musikalischen Zahlverhältnissen aufgebaut ist, ist die Architekturästhetik der Renaissance geprägt" (Naredi-Rainer 158)

The point is whether the leading baroque makers of woodwinds were influenced by these Renaissance theories of the fine arts. In all probability ancient traditions which are common to architecture and instrument making are likely to come to light here. The maker of woodwinds was familiar with the numerical doctrine of that time and profound construction was a "conditio sine qua non".
7. Which are ideal whole numbers for proportioning recorders?

144 is the basic number for all dispositions!

a. Dividing foot and inch according to the duodecimal system you will always have 144 lines in the end. The line is the smallest measure unit for wooden constructions. In Germany still today the ruler is called "Lineal".

b. The divisibility of 144 is enormous:

1-2-3-4-6-8-9-12-16-18-24-36-48-72

c. The Golden series of numbers 1-2-3-5-8-13-21-34-55-89-144 has 144 as an element which is the most useful of all the lower numbers of this series.

d. If the side of a pentagon consists of 144 units all the straight lines in the pentagram correspond with 144-89-55-34 etc (divisio divina).

e. Maker of woodwinds, familiar with the Holy Scripture, remember the ideal biblical figure 144 (apoc. 21,17 74), a sort of holy figure.

Finally linking up the quantity of lines (used for the sounding length by different makers) with the number 144 we will have a significant survey.

144 times:

\[
\begin{align*}
1 & \times 1/2 = 216 \quad \text{Stanesby sen. (VIII 1/2 yard)} \\
1 & \times 2/3 = 240 \quad \text{Bressan (Berlin 2801 3/8 Aune)} \\
2 & \times 1/3 = 336 \quad \text{Stanesby jun. (I) Quantzflöte} \\
2 & \times 1/6 = 312 \quad \text{Kirst} \\
1 & \times 7/9 = 256 \quad \text{Heitz (IX) Steenbergen (VII)} \\
2 & \times 1/12 = 300 \quad \text{Hotteterre (II)} \\
2 & \times 7/12 = 372 \quad \text{Stanesby jun. (I)} \\
1 & \times 9/16 = 225 \quad \text{Steenbergen (VII)} \\
1 & \times 11/18 = 152 \quad \text{Steenbergen (XIV) Maka (XV) Wyne (XIII)} \\
1 & \times 13/36 = 196 \quad \text{Bressan (X)} \\
1 & \times 29/36 = 260 \quad \text{Denner (VI)} \\
2 & = 288 \quad \text{Elle August Grenser} \\
3 & = 432 \quad \text{Yard Stanesby sen. (VIII)} \\
4 & = 576 \quad \text{Aune Hotteterre (II) Bressan (Berlin 2801)} \\
6 & = 864 \quad \text{Toise Bressan (IV+V)}
\end{align*}
\]

It looks as if the figure 144 cannot be avoided at all! This numerical figure is a sort of cardo in the course of designing a woodwind.

Is it true that the numbers on which the construction of recorders is based are only chosen under the aspect of practicality?

"There is no evidence that there was any mysticism or symbolism involved" (Michael Fleming comm. 854-48)
As to woodwinds there are several essential points inside the instrument which are of specific importance for the designer.

Proceeding from these major points the designer was able to go different ways when proportioning a woodwind. This idea points out the encountering variations of disposition. Often the instrument maker has chosen two starting lengths (TL or SL or the position of the mouthhole). The problem will grow when the sounding length is divided in an external or an internal way; sometimes both methods are employed in one operation. The basic idea of woodwind making has been international though it was likely esoteric. It is difficult to specify the exact times when the methods explained here came into existence.

There is plenty of analysis necessary in order to investigate and to solve the problem of the shape of baroque woodwinds.

Further workshop drawings from the Traverso (1) Collection Frans Brüggen would be much welcome!

P.S.

1 1/2'-flute: Is that not a more convincing expression than 445.6 mm?

It is most likely that the reduction of the plethora of ancient linear measures and the monopoly of the metric system were setbacks for the creative artisan.

Footnotes:
(1) see FOMRHI comm. 987
(2) Paul v. Naredi-Rainer: "Architektur und Harmonie" (Zahl, Maß und Proportion in der abendländischen Baukunst) Köln 1986; see page 208
(3) Günter Dullat: "Holzblasinstrumentenbau" Celle 1990; page 79
(5) Naredi-Rainer page 74/75
(6) "" 158-160
Violin-Makers' Inches in Proportion

Rémy Gug's Comm. 976 "Geometry, Lutherie and the Art of Historiography" has much valuable information, and it presents in an elegant manner a worthy and useful philosophy for this subject. Unfortunately, Coates' drawing of the Giovanni Maria da Brescia viol, which Gug uses for analysis, apparently has the neck and pegbox too short. The total length is not 60.5cm as given by Gug, but about 61.4cm (see the drawing published by Hills, and also compare the measurements given by David Boyden in his book about the Hill Collection). Consequently Gug's analysis of this viol is also in error.

Despite Gug's doubts, I believe there is a possibility of multiple inches even in this viol. For example, there seems to be: (1) in Brunswick inches - length of body 15" (356.7mm), length of pegbox 5" (118.9mm); (2) the inch given by Stradivari in the design of a lute - total length without tailpin 17" (613.7mm), narrowest width of the body 4" (144.4mm), widest width 6" (216.6mm); (3) the inch left by Stradivari on a 10" rule - total length including the tailpin 16" (621.92mm); and (4) Brescian inches - vibrating string 8" (314mm).

How can one explain the use of two or more kinds of inch in one instrument? Is it coincidence (so well explained by Gug)? Has one inch been created by a maker to suit a particular instrument? Did some makers keep a set of different measures inherited from their teachers? Did some makers copy the dimensions of different parts from various earlier instruments (each designed with a different inch), so that they unwittingly combined different inches? Perhaps there has been a combination of these situations.

I will give some examples to show how some of these inches apparently occur.

BRUNSWICK INCH (1) Stradivari's "Servais" cello of 1701 has an apparent body-length of 33 Bruns. inches, and a likely total length (including the tailpin) of 55 Bruns. inches if the long neck plan (Sacconi's, No. 311) is used. (This gives the near "Golden" proportion of 3:5.) If one uses the shorter neck (No. 308) which Stradivari had as an alternative for this model cello, this gives a neck:body proportion of 1:3, because this neck has a length of 11 Bruns. inches (to the edge of the plates).

(2) There is an elegant Brunswick inch construction that fits in four of the violins I have studied: Stainer unaltered 1668, Stainer "Ritchie" 1670's, Stradivari "Maria ex-Muir Mackenzie" 1694, and the G.I. Widholm which is illustrated later in this Comm.. In this construction P-P marks the maximum width of the lower part of the body, and M-M marks the maximum width of the upper part, and on these two lines are centred the main curves of the lower and upper bouts. These two lines are 9 Bruns. inches apart, and if P-P and M-M are linked by diagonals, their intersection (e) divides the 9 inches into 4 and 5. This could be a simple method to find the comparative body-widths 4:5. (3) The violoncello piccolo (or viola pomposa) by J.C. Hoffman in the Brussels Conservatorium museum, appears to be designed with only the Brunswick inch.
Hoffman's combination of 2, 2½, 3, 4, 6, 10, 13, 18, 19 and 32 inches suggests that he was using a rule marked in Brunswick inches, rather than one or two measurements unwittingly copied from another maker (even with extra measurements derived from the use of proportions). The instrument is apparently in its original condition.

The Brunswick inch was not native to Stradivari, Stainer, Hoffman or Widhalm. Therefore (despite the doubts of Gug), perhaps Coates was right to suggest that it was widely used; perhaps it was a universal luthiers' inch.

BRESCIAN INCH 1. In the violins I have studied, a body-length of 9 Brescian inches (353.25mm) is shared by the unaltered 1668 Stainer, the "Ritchie" Stainer, the "Betts" and "Messie" Stradivari, and the Widhalm (and there is probably a multitude of other violins with or near this length). 2. A total length of 15 Brescian inches is shared by the "Alard" of N. Amati, the 1668 Stainer, and Stradivari's "Maria ex Muir-Mackenzie" and "Le Messie". (This is certain in the Stainer, likely in the "Alard" and "Messie" because their necks are not replaced but only reset, and more conjectural in the "Maria ex" which has a new neck.) This total length is particularly interesting in the 1668 Stainer and "Le Messie" because they also have the 9 Brescian inch body-length, which gives the near "golden" proportion 3:5. None of the makers represented here were Brescian; did they copy these lengths from earlier Brescian violins such as those of Da Salo and Maggini?

STRADIVARI'S LUTE-PLAN INCH 1. Stradivari's "Maria ex" violin has a body-length of ten of these inches (361mm). 2. A length of vibrating string of nine of these inches (324.9mm) suits a number of early violins, bearing in mind that the size and position of the nut, and the angle and position of the bridge may all be altered a little. This length may relate to Mersenne's statement (as pointed out by Gug) that it was traditional to divide the string into nine parts. In most of the violins in my study, there are the following proportions: nut to bridge:bridge to saddle = 2:1 (in a straight line, or over the bridge); pegbox (to nut):nut to tailpin = 1:5; e.g. in Strad's Messie, pegbox = 2½ Brescian inches, total length = 15. This loosely supports Gug's proposal that the dimensions are generated from the vib. string.
STRADIVARI'S 10-INCH RULE (1"=38.87mm) This can be found in the Hills' Da Salò viola. A 9" vibrating string occurs here, also.

Grasparo da Salò viola, late 16th C., Hill Collection
(original condition)

This illustration also serves to show how different inches may have been combined in one instrument. It appears that the Da Salò has two or three sets of proportions (each in a different inch), and some other proportions not in any inch. These are not isolated examples, but only a sample to give an idea of the different ways inches seem to occur. Of those instruments I have studied, there are apparent multiple inches in all four Stradivaris, all five Stainers, the Da Salò, the A. Amati, the N. Amati and the G.I. Widhalm; and most of these instruments appear to include the inch of the maker's town.

As a final illustration I have drawn the front of the violin probably made by the Nuremberg maker G.I. Widhalm (1752-1822). This violin seems to be in its original condition, with a lion's head and an ornamental tailpiece. The body-shape (apart from the sound-holes) is like Stainer's, so the apparent geometry may be at least partly Stainer's rather than Widhalm's. Like the 1668 unaltered Stainer and the Ritchie Stainer, the Widhalm apparently has 9 Brescian inches divided into 4:5 juxtaposed against 9 Brunswick inches divided into 4:5. The bridge is placed so that it divides the body-length of 9 into 4 and 5 Brescian inches. Not only is there the apparent construction of MM separated from PP by 9 Brunswick inches which control the proportional widths of 4:5, but also the intersection of the diagonals also marks the narrowest part of the body. Therefore the three main widths of the body are linked by 9 Brunswick inches divided into 4 and 5. I find it difficult to believe this is accidental. The Widhalm also provides a good example of how triangles may have been used sometimes. To quote Djilda Abbott and Ephraim Segerman in Comm. 5 "If the analysis comes out with simple parameters it is highly probable that this is what the maker did".
My measurements were taken from the drawings published by Hills (Stradivari messie, N. Amati and Da Salò), from drawings in The Strad (Stradivari Servais, Betts and Maria ex-Muir Mackenzie), from a drawing by James A. Mackey (Stainer 1668), from a drawing by Ian Watchorn (Stainer Ritchie), and directly from the Hoffman and the Widhalm. All the information on inches comes from Herbert Heyde's Musikinstrumentenbau (Breitkopf & Hörte, 1986), apart from Stradivari's lute-plan inch, which is described in Sacconi's The Secrets of Stradivari (English translation) p.X.
A Comparison of Some Baroque Violins

This is a summary of a study made from drawings of nine violins, one viola and one cello: from the Hill Collection - Andrea Amati violin 1564, Nicola Amati violin 1649, G. da Salo viola 15---, and A. Stradivari violin 1715 "Le Messie" (drawings from Hils'); Stradivari violins 1694 "Maria ex-Muir Mackenzie" and 1704 "Betts" (from The Strad); J. Stainer violin 1668 (drawing by James A. Mackey), 167- "Ritchie" and 1679 "Wiedenmayer" (drawings by Ian Watchorn),?16- "Adelaide" and Stainer? cello 1647 (Drawings by Mark Smith). For convenience I abbreviate them to AA, NA, GdS, AS(Me), AS(Ma), AS(B), JS(68), JS(R), JS(W), JS(A) and JSvc. The da Salo viola and the Stainer 1668 are in original condition; I redrew all the other instruments into possible original forms.

Some apparent alignments and proportions (side)

1 Depth divided half-way by the inner edge of the front plate. This is in all 11 instruments (cello to inner edge of back plate).

2 Nut to bridge = double the length of bridge to saddle. All 9 violins.

3 Depth (including bridge) = half of the stop (measured in a straight line). In NA, GdS, and all 5 Stainers (cello-depth without bridge).

4 The stop doubled to form a significant point in the pegbox (often the nearest edge of the scroll). In 7 violins and the cello.

5 The back of the pegbox is aligned so that it balances the deflection of the strings at the bridge. In all 11 instruments.

6 The angle of the neck. An untilted neck (parallel to the axis of the body) seems likely in AA, NA, AS(Ma), AS(R), and JS(A) because of alignments such as those in 5, 7 and 9. The neck of GdS tilts c. 3°, JS(68) c. 1.5°, and probably JSvc c. 2.5° and AS(Me) 1°. The neck of AS(Me) probably forms a straight line with the edge of the front plate at the upper bout where there is a deflection.

7 Alignments of the pegbox parallel to the axis of the instrument: a centre-line through the tailpin to the centre of the scroll or the apex of the scroll. (AA and JSvc have this line off-centre with the tailpin nearer to the front plate.) In 6 - 8 instruments; JS(R) and JS(W) could be aligned this way, but probably have the neck tilted like JS(68). Some instruments probably have the back of the pegbox in line with the apex of
Some apparent measurements.
There is a great variety of lengths and widths of the different parts. Here are some of the more consistent lengths: (1) The vibrating string seems likely to be between 326mm and 328mm on 7 of the 9 violins. (These 7 violins include JS(R) and JS(68), each of which probably have the bridge at present about 2mm out of position.) The exceptional violins are AS(B) about 322mm, and AA about 307mm. If the nut is added to the 326-8mm, this could give the length 14 Brunswick inches; JSvc probably has 28 inches. (2) The depth (including the bridge) of JS(R), JS(W), JS(68), AS(Me) and AS(B) all seem to be 4 Brunswick inches, while JSvc is double this without the bridge. (3) NA and AS(Me) probably both have a total length of 15 Brescian inches, and a stop (measured along the axis of the instrument) of 5 of what I call Cremonese inch c. (4) A body-length (measured in a straight line) of 9 Brescian inches is shared by AS(Me), AS(B) and JS(R). (5) A stop of 8 Brunswick inches is shared by JS(R), JS(W) and JS(68), while JSvc has double this (16 Brunswick inches).

Some apparent alignments (front)
1. The three main curves are linked to the widest point (P), 2nd-widest point (M), and narrowest point (L). All 11 instruments.

2. The four corners (SSTT) are linked to the ends of the body (with or without the button and tailpin), by a diamond formed by two triangles, which are often equilateral. All 11 instruments.

3. The widest and 2nd-widest points have a centre common with the four corners. In 9 of the 11 instruments. In GdS, this centre (e) is also the narrowest point, and in 5 other instruments e is on the top of the sound-hole circle.

4. A sound-hole circle can be constructed to touch the upper sides of an equilateral triangle based at the widest point, in 9 of the 11 instruments. The other two, GdS and possibly AS(Ma) have an isosceles triangle with its top at the end of the fingerboard. The four corners are equidistant from the centre of the body in 7 of the 11 instruments.

5. In all 5 Stainer and in AS(Me) the length of the sound-hole = the radius of the sound-hole circle.

Some apparent proportions (front)
(1) The widest point compared to the 2nd-widest point (PP:MM) =
5:4 in 8 of the 11 instruments. (2) The widest point added to
the 2nd-widest point = the length of the body (with or without
the button and tailpin) in 8 instruments. (3) The width of the body
at the lower corners (TT) = half the length of the body (with or
without the button and tailpin) in 9 instruments.

My hypothesis is that a series of desirable proportions, align-
ments and measurements like those above could have been suffi-
cient to provide the basic design of a violin. I acknowledge my
indebtiness to two books: Kevin Coates' Geometry, Proportion and
the Art of Lutherie (O.U.P., 1985), and Herbert Heyde's Musik-
instrumentenbau (Breitkopf & Härtel, 1986). From Heyde's enorm-
ous list of historical inches I obtained the information for the
length of the Brescian inch (1 = 39.25mm), the Brunswick inch
(1 = 23.78mm), and what I call "Cremonese inch c" (1 = 38.87mm),
which is the inch on two rulers "left by Stradivari". I would
also like to thank James A. Mackey of London for informing me
about his drawing of the 1568 Stainer violin.

Comm 1010 The Early Design of Stringed Instruments
Roy Chiverton

I enjoy Remy Gug's comms because he points us back to
basics, and introduces new perceptions. I particularly liked
Comm 976, but, prompted by his very sensible approach, I would
like to suggest something simpler.

There are variables which must be stressed, such as
changes in the instrument since it was made, the initial accuracy
with which it was made, the state of the mould if a mould was used
(I believe one surviving Stradivari mould is well worn), the pos-
sibility that one mould was copied from another, the speed of mak-
ing, the use of apprentices or other helpers to make parts of the
instrument.

It may not be unfair to question the degree of literacy of
early instrument makers (ie early makers). No doubt the guilds
held much knowledge. Did it necessarily include architectural in-
formation? Did the guilds inculcate the use of different units of
measurement in the same instrument? How far can one push proba-
bility?

It is also the case that there were a lot of instruments
and makers around before the translation of Vitruvius of which
Kevin Coates made much became available. We are likely, there-
fore, to have new concepts superimposed on tradition (compare the
French classical theatre revolution where Aristotle's unities
were introduced into a theatre full of rhododendron, pantomime
and the like, without, however, replacing it).

We also know that if you ask people to divide a line or
strip into two sections the proportions of which they find pleas-
ing, they will tend to come up with the Golden Mean division.
And you have only to go into the garden to find the Fibonacci
sequence in evidence. Design depends very much on proportion
to please. It would be instructive to apply the ideas of those
who find these significant proportions and units in viols and
lutes to the furniture of the period (just as a comparison of
recorder and other turned design, eg chair legs, might be in-
structive).
This is not to say that I dismiss the ingenious analyses of Kevin Coates, Gerhard Söhne, Mark Smith, and others. There's got to be a lot in what they say. But I would prefer to start from Rémy Gug's squared paper, which seems to me a great idea. On this I might draw a line representing the length of a set of strings whose quality I knew would give me a good sound at a tension I thought I could plan an instrument to sustain (I am presumably building as light as possible within my stress requirements, while still aiming for a particular sound quality). Around this line I would draw my instrument. The fingerboard and pegbox would extend a pleasing amount from the body. The body would have an agreeable shape, a bit narrower above than below (which happens in human beings as well). I would use compass and straightedge, but might very well link two compass-made curves by a sweet curve drawn freehand. When I'd got it something like, I might see how far I could rationalise it without losing its effectiveness. Thus, where I had two compass points a little way apart whose positions I had chosen because they gave a good visual result, I might see whether I could make them exactly two (say) Branswick inches apart. I personally prefer to stick to the units of measurement of my upbringing—it saves me hunting for the other ruler and sometimes making mistakes. But since I'm working on squared paper, using those units is easy and influences my design. And when I want a lower-pitched version of the instrument, all I have to do is define the squares as $1\frac{1}{2}$ or 2 units instead of 1. There's a lot more I have to do before this becomes a working instrument. It would be odd if all I had to do was to put it together and lo—a masterpiece. The volume is important, but if I make the ribs too deep or shallow, the instrument may look wrong from an angle, so I may have to alter width or length, and that may have other effects both on design and sound. And so on.

Michael Fleming (Comm 854) has, of course, already made a number of these points, but it seemed worth keeping them in readers' minds, while, I hope, adding a little. As a last point, there are surely other influences on instrument design. Is not the cittern an adaptation of the kithara shape to the cockleshell of St. James of Compostela (I don't think this is an original idea of mine) (compare the adaptation of the Roman Saturnalia to Christmas), and hence the appearance on the backs of some citterns of the back of a cockle or scallop in the form of rays widening from the "hinge". I can easily persuade myself that I can see the same influence in the back of the Palmer orpharion, but this time with the "hinge" at the bottom.
There is very general agreement to the fact that wood, as a raw material, has considerable influence on the sound of an instrument made from it. The answer to the question whether, without exception, old instruments sound "much better" than those built in our time, will be agreed on much less generally; it is subject to a rather personal point of view.

Thus the question arises whether the sound of the early instruments improved in the course of time: that knowledge is beyond the realm of anything that could be proven experimentally. We would also ask how exactly the aging of the wood influences the sound of an instrument being played for decades. Since we cannot prove any statements concerning this last question, instrument builders are free to choose their own opinion or alternate, according to mood, need or whatever, between two options:

Either it can be assumed that historical instruments in general sounded extremely beautiful in earlier times, too; the role of aging is only secondary.

Or, as is often stated, it is the passing of centuries that is mainly responsible for the quality of sound achieved today.

In the first case, though, we encounter the problem of our modern incompetence: let us grant the subjectivity mentioned above, why, if aging plays just a minor part, are our "copies" not comparable to the original instruments?

In the second case we could never in our own lifetime enjoy "the best" performance of the copies we build!

40 or 80 years?

These questions did not arise now. Obviously in earlier times similar experiences seem to have been made, too. An English work on "Natural philosophy", dating from the end of the 17th century, comments on the improvement observed in several lutes, which is there attributed to aging. Robert Boyle mentions in the chapter on the "inner movements" of different kinds of wood some facts which are relevant to our topic. They were communicated to him by experts. He explains first that wood needs several years to achieve firmness and stability. Then he adds: "For ancient musicians and makers of musical instruments declare, that some lutes require forty years to bring to their due tone, if the wood be thick, and other circumstances not very favourable. And I have been inform'd, that there are some famous instruments of the same kind, which, to attain their full seasoning and best sound, require
the space of fourscore years"(1). Eighty years! Considering the average lifetime then, many a maker of lutes may not have known about the highest perfections of his art.

According to Boyle the artistic skill of an instrument builder could not always do without the benefit of time. We can easily imagine that the sound does not profit from wood which is left too thick. What else might the "unfavourable circumstances" be? Let us assume that they refer to the sounding properties of the wood itself.

If excellent quality of sound is desired the safest method would be to work with well-sounding wood to begin with. Apart from all other considerations good-sounding raw material guarantees more than anything else good-sounding instruments.

We will see from the following quotes that the old masters paid a lot of attention to this thought. They also knew the means by which they could achieve that goal. In this article we will discover a very old method, today seemingly completely forgotten, which allowed an answer to the following question in a simple and matter-of-fact way:

How can we find the "best-sounding" wood?

What, in other words, were the means at that time to elicit from nature the best sounding wood, namely that which a builder of instruments would desire?

Again we must take into regard that our forefathers dealt with nature in a different way than we do today. They did not have power tools at their disposal, neither for the cutting nor for the transport of wood. But they had to secure their supply of wood.

Being members of a different civilization they had different means at their disposal. In our case we shall see how cleverly they used gravity, a dominating force then as now. But in the spirit of their time they also knew of simple and meaningful ways to make acoustical estimates. And what is it all about?

Timber slides

As is well known, the best resonance wood is found in high mountain chains. Working conditions are most difficult there, both for cutting the wood and, what will concern us here, for transporting the timber down from an exposed or remote origin; slopes, valleys, brooks and streamlets have to be mastered.

At some places in the Alps men have mastered the building of special tracks; round timber is thereby transported from far-off side valleys to a lake if it is to be floated or to a road accessible to vehicles. They were called "Sovenda". Figure 1, by J. R. Schellenberg (1782), gives a detailed view of such a construction (2). [s. next page]

For miles on end the timber would slide down with great noise. The whole thing rather resembles a kind of giant xylophone, and this our ancestors knew how to profit from. From the experience of generations had resulted the knowledge of "hearing" the differences between the different kinds of wood while listening to the sound of its sliding down. The difference could even be attributed to morphological
differences. Thus a certain kind of spruce would generally sound much better than other sliding wood. These more "gifted" conifers are still today known as "hazel spruce".

Much has been written in our century about "Wimmerholz"(3). We shall see how easily our forefathers could recognize it. A hundred years ago a Journal for forestry ("Centralblatt für das gesamte Forstwesen") knew about it: "If timber is transported via slides, the timber sliding over the frozen ground, stones or other timber, any hazel spruce is recognizable from its bright, singing, long vibrating tone"(4).

The author of that quotation is not just given to revelry, but referring to experiences of his own. "Anyone who has ever been near to a timber slide while it was being used has noticed a remarkable difference in the sound of the sliding timber; thus this effect cannot be doubted"(4). Since, as far as I know, such slides are no longer in use we cannot test this statement. As interesting as such an experiment would be, it is hindered by our degree of civilization. Forest paths cannot be used for acoustical tests; the sound of the timber is overwhelmed by the sound of the motors; timber is dammed to silence. Let Nature speak!

Returning to our eyewitness and to the quieter woods of the past we encounter an Italian trader: "There is no doubt about the fact that this "singing timber" has always been in demand and that it achieved a good price. In former times I had more than one occasion to convince myself. If for example in Carinthia timber had been prepared for transport, an Italian gentleman would show up, settle himself nearby and listen attentively to the sound of the thundering timber. Whenever timber passed by that caused the air to vibrate his face lighted and he told his servant to mark it. He recognized the sound from a great distance. Often he would sit there and wait for hundreds of rumbling timber to pass. As soon as the singing sound was heard he would be looking for the "singer" and found it at once. The higher and longer the sound, the more he liked it. Thus he would often wait for his "singers" for many days"(4).

This is a beautiful example of the old type of "hunting economy", where patient humans could listen to nature and patiently wait till the desired raw material was found. In the same patient way they searched for other material, too, for example for the special ore needed for some specific metallic artefact (swords and so on).

This article intends neither to instill nor nourish a longing for the "good old times" nor to imply that we, seeing ourselves as dwarfs, could not build as good instruments since we have to do without the help of giant slides. All we wanted to show in this communication was that the old masters had means available that we today do not know about or cannot afford. And that, again, does not imply that we could not reach our present aim with our own means.

Finally we return to the Carinthian Alps and to the middle of the last century: "When the timber was delivered the marked timber would be gathered and transported to Italy via the Plöcken, then still a usable pass, where it would be used for the building of string instruments. This gentleman, too, insisted that the timber belonged to the 'hazel spruce' species"(4).
Many a violin maker whose instruments today sound as well as his name must owe a great deal to this Italian gentleman. We do not learn any more about him in the article quoted above.

In the 18th century

Let us now explore whether this clever choice is a very old method. Timber slides are known to have been used in many alpine valleys earlier than the 19th century. We are fortunate to get exact information from Hans Rudolf Schinz, parson in Uitikon, who published from 1783 onwards his "Beyträge zur näheren Kenntniss des Schweizerlandes" [Contributions to a better knowledge of Switzerland] (2).

He writes as an eyewitness and obviously is quite impressed himself: "In the middle and lower valley the abundance of timber found is put to better use, as fire-wood and for building purposes. A lot of it is being exported, and the means of transport employed in some of the districts, especially in the Mahntal and Luggaris, are quite remarkable. Where there is no water or where the valley is very narrow, such that timber thrown into the streamlet would hinder its own way, the wood would be left to decay had methods not been invented to bring the timber down without the aid of water and if paths had not been brought into the wilderness, where nature did not provide any.

This the Italian traders achieve by some kind of bridge or slide; in a most audacious way. They bring down not just very small timber, fit for the saw, they bring it without the help of water and without great efforts from the farthest and wildest regions to the next river - in winter only, though"(2).

We already know the procedure. It will be interesting to learn why these slides would work in winter only. The reason is their way of construction, a fine example of advanced carpentry. "These slides are made from wood only, without any iron or nails and are stable only because of the artful way of attaching one beam to the next one and because of their interaction by pressure and connexion"(2). These frames could fulfill the high demands only in freezing weather. "Additional stability was attained in winter by ice and snow and the effect of freezing, that served to glue the parts together"(2). Nails and glue were thus replaced by the binding force of frozen water.

"The Italians call this kind of slide 'sovenda'. Its construction is a very specialized task which plain carpenters or wood chuckers could not achieve. Only the inhabitants of the little valley of Pontirone (at the entrance of the Bolenzer valley) know about this craft and they get schooled in it from their early days. The men there know of no other craft; each year they leave women and children and, having made contracts with the traders, live for weeks and months at a time in the wilderness, surviving on the most simple food, in order to do their hard work..."(2). This kind of effort would not be possible without the help of traders who were well provided with capital: "There exist in the Italian part of Switzerland several societies mostly from Brisago. They provide the timber needed by the large city of Milano that produces everything but wood in abundance in its rich fertile plane. These traders combine their resources, find out where far-off forests might be available for cutting and explore them with the most experienced men of Pontirone."
They will, based on their experience, predict exactly how much wood there is and whether it will be able, considering all sidetracks and detours by slopes and hills, to make its way down to the next river (2).

The decision made, hard work started. "They will work according to their own plan and cut the forest in the direction that seems most favorable to them, with the cut trees falling in a way that makes it possible for them to get to the slide. The trunks will be cut in blocks of 8 to 15 feet. The branches remain there. Wood that cannot be cut into blocks is used for the building of the slide, which is started right at the forest. In order to save work and material the timber will slide on the ground soil whenever the slope is sufficiently steep. For that purpose it will be made as even as necessary. A small wall or dam of stones, soil or pebbles will be erected, the hollow will be lined and along its length the dam will be covered with beams which are cut to measure or fastened with poles. If the more horizontal surface gets lost in a cleft the slide will be built where there are the fewest curvatures, corners and angles... The slide must always be at least three feet wide and two feet deep, and the strongest logs must be able to pass unhindered. Valleys, brooks, clefts and crevices thus can be bridged" (2).

It may not always have been that simple, for the force of the timber thundering down was greatest in the bends. "Experience is needed most for the building of the sharp corners and angles in such a way, that the sliding timber blocks do not tear the dam apart. They should not get stuck or hinder the following blocks, forcing them out of the slide and into the next abyss. For that reason the blocks must have a given length. If they are too long, they would get stuck, if they are too short, their weight would not suffice to let them slide" (2). All of that needed the proper measure of the technique to be successful; economy too required the proper proportions. "These slides were constructed during the summer and leased according to their length. The unit of measure is called Pontana and measures 26 feet. One Pontana costs 7 1/2 Lire and that includes the costs for cutting the wood and building it" (2). These high costs seem to be justified, since we may conclude from the parson's remark that wood in Milano must have been pretty expensive at the time.

On a cold winter night ...

Let us once more accompany Hans Rudolf Schinz into the mountains. The Sovenda has been finished in the autumn. It can be used only when it freezes. "After the timber has been cut the blocks are heaped up near the Sovenda in such a way that in the winter two men with wooden levers can without much effort lift a log a minute onto the slide. And as soon as the cold nights of January and February arrive, the traders along with 60 to 100 burratori start their work of filling the Sovenda and all gaps in the wooden structure and the lining with snow. Then they lead a brook over it or pour water out of pails, especially where the joints are, in order to give stability to the frame and the beams which thereby freeze together. The firmer the path is frozen the faster the logs will shoot down. A lot of attention is given to filling all corners with snow, such that it resembles a smooth canal" (2). Now we know about the technical part.
Let us enjoy the fascination of the special atmosphere of these fantastic nights in the cold mountains. "When everything is thus prepared and ready great fires will be lighted at every angle and corner and in distances of about 200 yards; they light the slide. At each fire two or three men keep watch and when the sliding down of the logs begins each group of men passes the word on to the next one. Message can thus be communicated in a matter of minutes back and to from points hours apart" (2). This echoing sound of the night is in fact polyphonic music, since the calls of the Burratori join the sound of the "singing" timber. And this goes on for hours.

"The only job of the men at their posts is to guard and aid the sliding of the logs by hitting them with an axe and keeping the slide clean of any obstacle; if however anything hinders the course the first guard has to be notified so that the start of the sliding down can be stopped. This work will get started by nightfall: it continues till early morning; in twelve hours thus 3000 to 6000 logs will be transported over two hours distance. The men are in a great hurry, for it is very important that all the felled timber - about 12 000 to 20 000 logs - can be gotten out of the forest in one stretch, since the sovenda may get damaged as soon as thaw weather sets in.

The speed of the biggest logs, the noise, the sliding, the halting, the shouting and whistling of the workers in the wild mountains, the lightening, the awe caused by deep night and cold winter, rocks that are covered with snow, that often thunders down in small avalanches, adding a noise of its own. All this creates the fearful atmosphere of a special festive event. The awe it inspires can only be dispersed by lively conversation and the boldness of the enterprise itself" (2).

And all this time and in spite of the hecticness an Italian gentleman will sit quietly at a suitable place and strain his subtle and experienced ear in order to recognize in the stream of wood those logs which nature meant to be used by the builders of instruments. With a joyful gesture he will conduct the chosen logs from the solemnity of the cold alpine forest into the festive world of warm sounds.

In the 16th century

This report by Schinz might be valid for even earlier times. Such traditions did not arise in the 18th century. It seems probable that the Pontironi drew on experiences made in very old times.

We are not yet able to find out when the first slides were built. We do know however that the situation described here was not very different in the 16th century. "Luggaris" and "Borras", are names mentioned 200 years before Schinz in the same context, and Italian societies of traders provided with a lot of capital must have been influential then as later. We learn from the report of Josias Simlerus dated 1574 (5), that timber from the Ticino was regularly brought to Cremona and Venice. "It is common practice, that the long trees from Luggaris get cut into logs, which they call Borras, so that they can be transported through the narrow valley and the curved and wild mountain rivers to the great lake, where they float for the transport across the lake and further on through the Ticino to Milano and Padua. They transport not only the floats but also the wood from larches and other
trees with desired qualities, firewood especially for lime kilns and charcoal on the lake into the Ticino and further on the river Po till Cremona and up till Ferrara, Mantua and Venice to the ocean"(5).

Since Simlerus does not mention the Sovenda we do not know whether slides were in use then. Thus we may never know whether already in the 16th century an Italian gentleman found out about the singers in the noise of the night and had them put aside.

Critical remarks

Let it be. Finally we want to stress one point and compare the method of old times with our practice today. The historical procedure we got acquainted with in this article does question our way of judging the quality of wood. Then it was judged above all by the ear. The log's "singing" on the slide informed the observer, be he instrument maker or knowledgeable trader, very directly about the acoustical qualities of the wood. It could not have been tested any better. The timber was discovered vibrating ...! This is an example of holistic thinking - a typical attitude then and partly lost now.

Our ancestors knew that the behaviour of a material at large mirrors that in the small. From looking at the trunk no information was gained for the listener; only after cutting or while working with the timber did the trunk reveal the secrets of its anatomy to the master. But then the choice had already been made. One chose by ear!

What can we today achieve - or believe to achieve - when we judge mainly by sight ? Who could afford to listen to the singing of the timber ? We want our resonance wood to be fine, most regularly built, without any twists in the structure of the annual rings or the medullary rays, without the tiniest twiglet, and with an attractive, immaculate colour...!

In any case, good resonance wood has these characteristics now as then. But nature is rich in variety and has some tricks at its disposal that seem ironical to us humans. Does only "immaculate" - in our sense of the word - wood sound well ? Would not the use of non-immaculate wood in some old instruments, which are quite average with regard to the quality of the sound of historical instruments prove that it is not the visual aspect alone that guarantees high acoustic quality ?

This report about some of the aspects of past techniques suggests that we should reflect on our own behaviour. As members of a society that tries to appeal to the eye while it ruins the ear we may behave - with regard to the selection of wood - like a person wanting to buy "good apples" and deciding on the ones pretty to look at, though the other ones appealed more to the taste ? Do we want to replace one sense by the other ? We may learn from the "Italian gentleman" mentioned above that ear and eye may not always be exchangeable.

We may assume that those trees still growing in our forests - or what is left of them - do not differ essentially from those of past centuries. Very different though, as we have seen, is the present "art" of determining which timber will be best sounding. The old method has proved to be successful. Though we may find it somewhat bothersome it
is a fact that timber from former times does not betray the hard and cold slide on which it rumbled down. But it saved forever the glowing warmth of the fire accompanying its first steps into the realm of sound, even before a human ear recognized its golden worth.

Notes:


