Harpsichord voicing

This is the new English translation of my article on harpsichord voicing, which has previously appeared in Swedish and Dutch (1995 and 1998), as posted on www.skowroneck.de, as an all-in-one pdf.

The article is intended as an encouragement for using bird's quills in harpsichords. However, the commonly used delrin is a very good alternative for quill, if it is used well. Even the reader who is not considering quill will find useful information about delrin further below.

Introduction

Harpsichordists hear a lot from other musicians about how their instrument sounds: it is too loud, says the recorder player; it is too soft, say the members of a string ensemble; it sounds too aggressive, says the cellist who sits beside the bentside; it is unreliable and out of tune, say all those people who have to do with casually played conservatory harpsichords. A true harpsichord lover might find these remarks ridiculous, but let's face it: there is every reason for learning how to improve one's tuning technique, how to keep the dampers in shape and, of course, how to make proper plectra. A harpsichord in poor shape has, in terms of charm, not much to offer - and even in an instrument in better shape we must accept most of the basic conditions that characterize harpsichords: their dynamic range is relatively small in comparison to other instruments, no matter how hard we hit the keys; their tone has a high content of partials; and although the non-musical noise that accompanies the tone production - that is, the mechanical clicking that accompanies the attack and the characteristic sound heard when we release the key - may be low in a good instrument, the player has little influence on it. If we want to maximise our possibilities as players, we ought to look more closely at the part of the action that produces both, the tone and the noise: the plectrum.

Usually, harpsichord plectra are made from delrin. This is a rather sturdy material, which is used in, among other things, miniature gearboxes and the likes (having model trains as a hobby, I have learned to appreciate such unmusical applications of this material as well). A delrin plectrum can keep its shape for a very long time: say, as long as a tap washer. As with tap washers, a delrin plectrum's sturdiness and proper function both depend on how its condition was at the beginning of its use and on the conditions during its use.

Since I am not interested in reiterating, without solid reasoning, any of the various plectrum philosophies that live out there in the wide harpsichord world, I would at the beginning like to propose a list of desirable plectrum qualities on which everybody can easily agree. These qualities are three in number. A harpsichord plectrum

- needs to be sturdy,
- must function well, that is, it may not get caught in some way, or pull the string out of tune,
- needs to produce a tone that is suitable for the instrument.

Sturdiness is to a large degree defined by choosing the right form of the material. Delrin for harpsichord plectra is made available in several forms, and according to my observations their sturdiness varies a lot. Apart from the cast plectra, small plectra in snippets cut or stamped from plates of a varying thicknesses are the most commonly used ones. There are several problems connected to pre-shaped plectra of all kinds, whether they were cast or cut. One specific issue with the pre-cut ones is that the sheets of delrin used for their production usually break slightly more easily in one direction than in the other. I have heard various explanations for this, which all have to do with the production process: the material in itself is amorphous. In any case, the consumer who uses pre-cut bits of plectrum has no chance to verify whether these were cut in the sturdier or the weaker direction. My first recommendation is hence to use plates of delrin instead of snippets, and to test the good direction by bending a plate in one and the other

direction. Afterwards one cuts narrow (plectrum-wide, plus one mm in reserve) strips in the good direction.

A second problem with pre-cut plectra is that they might have been damaged on a microscopic level during their production, depending on whether they have been cut or stamped, and on how this was done. For the final consumer of these bits it is simply impossible to know why a certain batch of delrin plectra keeps breaking, but the fact remains: the plectra in some harpsichords break at a rate that is untypical for the good qualities of delrin. There must be secondary reasons for such a behavior. Breakage of harpsichord plectra is not a matter of fate. Delrin plectra are not at all supposed to break all the time. If one keeps having such problems with one's harpsichord, one is probably better off if one looks for a different source for one's plectra.

The sturdiness of a plectrum is also put at risk by any shape that results in stressing the material in an irregular fashion. All exaggerated forms of a wedge (as seen from the side) and pointy shapes (as seen from above) enhance the risk of breakage in this fashion. I am not arguing aesthetics of sound here: the sound produced by such plectra is high in partials and penetrating - there are many harpsichord lovers who subscribe to this sound as being typical for the harpsichord and I will not claim that my own, different, taste is worthier. However, the wedge- or point-shaped delrin plectra are, in terms of durability and function, completely unsuitable. At their base, they bend not at all or only very slightly, in their middle they bend still only slightly while their tip has to provide most of the necessary flexibility, thus bending very much. This results in their tips bending permanently downward within a short period of time. This prevents the plectra from slipping back over the string on release. I am not exaggerating. I have been called to rescue several instruments that were newly voiced by a professional, and that had developed this fault after only one week. Alternatively, or in addition, the tips will break off after a much too short period of use.

Also those plectra that have been provided with ridges, valleys or washboard patterns, due to being shaped by using a blunt knife or a wobbly scalpel, belong to those with sections of over-stressed material.

Whichever shape we intend to give our plectra, it is important to achieve a smooth finish. Any part of a plectrum thinner than the surrounding areas will break prematurely. Here we have the explanation of why hastily produced mid-rehearsal plectra have a tendency to break within days. There is no bad spirit at work - most of the time, impatience, bad equipment and bad light are more than sufficient.

The good **function** of a harpsichord plectrum is a matter of its length and of the shape of the lower side of its tip:

- it must not touch the string when the register is switched off,
- it may not be so short that it, when engaged, barely touches the string so it sometimes sounds loud and sometimes soft,
- it must safely slip back under the string when released.

The first two points need no further explanation. To test whether the plectrum actually does slip back properly, one has to manually dampen the string and release the key as slowly as possible. The best way to describe this test is that you should act as if you actually *wanted* the plectrum to hang on the string. Those plectra that frustrate your effort are fine. Those that respond to your wishes are not (various maintenance course members have failed to understand the twisted logic of this image, but I still like it). If the plectrum doesn't slip back properly, the usual solution is to cut the tip diagonally from below so it makes a slope that glides off more easily. In plectra made of quill, this shape is absolutely necessary.

The third desirable quality of a plectrum is that it produces an appropriate **sound**. The factor that influences the sound most of all is the thickness of the plectrum. Needless to say, it also defines the heaviness of the touch. Many people seem unable to make a distinction here and let their favorite touch dictate the shape of their plectra. This is most definitely a mistake. If we believe the harpsichord to be a musical instrument and not a tone-processing machine, and if we want to honor the effort of the maker in any reasonable manner, we should listen to what the instrument is willing and able to do in terms of volume and sound quality, and we ought to voice it accordingly. The

player who cannot adapt her or his playing technique to the resulting touch should look for another instrument.

However, if a harpsichordist wants to be heard by his audience, he will naturally choose to make the plectra as thick as possible, leaving only a little margin for the tone not to become forced. The definition of the appropriate point may seem to be a matter of taste, but this is only partly the case. If the plectrum is too thick it will do two things:

- it will tend to pull the strings out of tune. If this happens in a harpsichord that has been tuned well and if the climate in the hall has not changed substantially, this is a clear indicator that the plectra are too thick for the stringing used in the instrument. A harpsichord that is kept in a good shape and stands in a room with a stable climate does not go out of tune through being played.

- it will produce a loud plucking noise which usually will interfere with the tone itself and hence shortens its sustain. In a larger hall, the total impression of the instrument will, in this case, be dominated by its mechanical noise on the one hand, and its lack of a proper sound projection on the other. Projection is a player's ability to, in concord with his instrument, truly reach out to the listeners. If a harpsichordist thinks that his instrument is loud enough and his playing is transmitted to the audience in a distinct fashion, while out there the harpsichord's rattling and twanging reverses this effect, this is first and foremost a functional fault of the instrument.

While these criteria help to define the thickness of the plectra in a certain instrument, the result cannot be directly transferred to others: every harpsichord has its own characteristics and will need a fresh approach.

You will find drawings that show the shape that I give to my plectra further below, as well as a complete description of how to make plectra out of strips of quill or delrin. First, however, I will introduce the material that serves as my voicing reference: quill.

Quill

Bird's quill is the historically most common material for harpsichord plectra. In some sources from the end of the 18th century, a growing dissatisfaction with this material becomes apparent. Today this is usually explained by the increasing popularity of the fortepiano: people were less and less patient with keeping their harpsichord plectra in good shape while the instrument was becoming old-fashioned. Most of the historical alternatives for quill, such as leather and metal plectra, also were introduced around that time. Earlier than that, harpsichord plectra were simply replaced when this became necessary, and the sources display no or very little disgruntlement with this circumstance. Of several species of bird, the common raven (*corvus corax*) was a special favorite for harpsichord quills in many traditions. This is perhaps not so surprising. The raven was for a long time seen as a bird of ill omen and has been relentlessly hunted throughout Europe for centuries. This must have generated enormous amounts of easily available and marketable feathers (I will return to the usefulness of various kinds of feathers further below).

The most important **difference between bird's quills and delrin** is their hardness. In and of itself, quill is a much softer material than delrin, but its lengthwise fibrous structure provides the necessary springiness for behaving in a similar fashion nevertheless. One should note that this explanation is technically logical but chronologically backward: I ought to say that delrin, which is a modern replacement for quill that lacks its fibrous buildup, must be much harder in order to match the springiness of quill.

These materials also differ in their durability and their reaction to changes in humidity and temperature. Quill plectra weaken progressively during use and finally, they will bend over at their weakest point. A worn quill plectrum will hence sound progressively softer but, in most cases, it will remain functional for some time, for example until the end of a concert. In contrast, a new delrin plectrum will become somewhat harder after a few weeks of use - after that it might function well for many years. However, instead of progressively wearing out, it will simply break off at a given moment. This means that, in the case of

a failure during a recital, one has to stop and replace the plectrum (audiences love this. I don't). Delrin gets softer at high temperatures; quill usually gets softer in high humidity (this is the reason why it is impractical to perform harpsichord maintenance using quill in very humid conditions).

In spite of these differences it is quite possible to make quill and delrin plectra that sound very similar. Quills that have been hidden in a delrin instrument are usually impossible to find by ear. One of the most usual methods of testing the properties of quill is nevertheless to fit a few quill plectra in a whole register with delrin plectra. This principle makes no sense at all: why would one take pains to make them similar to delrin if one, in fact, is interested in their otherness? Not surprisingly, many modern judgments about quill plectra are negative: players do not see their advantages in terms of sound, and find fault with their lack of durability.

The various **advantages of quill** only become apparent in a harpsichord that is predominantly or entirely voiced in quill. These advantages are mainly due to the fact that quill is a softer material, as described above. One of the main results of this fact is a reduced mechanical noise (both when playing the note and when releasing the key). Simultaneously the springiness of quill produces a brilliant tone with a high content of harmonic overtones: the pluck of a quill plectrum produces, in comparison to delrin, more music and less noise. This has the following consequences:

- quill improves the projection of the sound away from the instrument and into the hall.

- quill creates a harpsichord sound that blends better with other instruments.

- the articulation noise of quill plectra at the end of the tone is softer (should the player *intend* to make a loud articulation sound, she or he could always release the key more quickly).

- a quill plectrum can be voiced slightly louder than delrin before sounding forced (see above), because the total level of mechanical

noise is lower. Nevertheless, the touch feels softer than in delrin instruments.

All these remarks are based on a long period of observation in many very different harpsichords, but they remain to a large degree subjective. A few disclaimers are in order here:

First, I cannot guarantee that my experience can be repeated exactly by other persons, because I am not there to check how they make their plectra.

Second, the comparison of sound projection and volume in various instruments is, in practice, very difficult, because the ear adjusts so very quickly to new circumstances.

Third, plectra of whichever shape or material might in the best case bring forward the best qualities of an instrument, but there is no possibility that the plectra alone can help to transcend its limitations. You cannot make a dog levitate by using a better type of leash. A dull string remains a dull string even if it is excited by the most heavenly type of action. This is a very important thing to realize before one, for example, begins to change all the plectra in one's actually perfectly fine harpsichord.

What kind of bird?

Raven has again become more common in Europe, but it is still difficult to find raven feathers in the wild. I live at the edge of a Northern forest, and occasionally I can hear a raven make its characteristic croak somewhere out there, but I have never found any of their feathers out in the woods. Feathers of other larger crows are much easier to come by. In rural USA one might find wild turkey feathers, which work fine for plectra (one should find out whether collecting or owning certain kinds of feathers is legal in the state in question); wild goose feathers are useful as well, but domestic goose is not at all durable enough. The idea that a bird needs to fly for its feathers to be any good for plectra is, however, a myth.

I am going to discuss commercially available feathers-for-harpsichords, because first of all, they are easily available through the established dealers in harpsichord parts. Second, I admit that I would not pay any money for them. Here's why: I have found the feathers of the larger types of gulls to be the most useful for making harpsichord plectra. In addition, these feathers are ridiculously easy to come by for anyone who occasionally comes close to the coast. Just take a stroll at the beach and search through the debris from the last high tide. One feather of a large sea bird provides plectra for between one and two octaves. On certain days, one can collect enough feathers for several harpsichords in less than an hour.

Thickness and loudness

Long ago there was an article in *Early Music* where the claim was made that raven was the favorite historical material for quill plectra because one could voice it louder than other feathers. This is not true. Certain parts of gull feathers can be voiced much louder than any raven feather I have seen - really very much too loud, in fact, for any harpsichord. It is also not true that we must select the hardest and thickest feathers: we might be looking for those that sound best - that is, if there are any important differences at all. We are definitely looking for those that cause the least trouble during their preparation and, of course, for the ones that are the most durable. So we would have to choose specific species of bird known to be suited for the job and to pick those feathers that are big and springy enough and that have an appropriate shape for their task.

Durability versus sound

In March 2003, I began keeping a record of the quill plectra I replaced in one of my harpsichords. While in the main 8□ register, sixteen plectra from before that time still are playing today (in the second 8□ about one third is older than five years and in the 4□ only a handful

have been replaced since 2003), some other tones in the instrument have needed multiple replacements during these five years. It becomes clear that there are no rules for the durability of quill, and that very few predictions can be made beyond the most obvious one: sloppily cut plectra do not survive for a long time.

Very generally spoken, I have observed that American wild turkey, which sounds beautiful, is the least sturdy of all the kinds of feathers I have used. This is a real pity because these feathers need very little preparation. They are almost automatically of the right thickness and they have a nice curve that enhances their first-month (or so) stability and creates a good sound. Raven feathers and the larger feathers of various other birds from the crow family probably sound best of all (if one can say any such thing), but they are not significantly sturdier than those of the wild turkey. Even these feathers have the right size and thickness most of the time and need very little cutting and scraping.

Gull feathers, on the other hand, come in a large variety of thicknesses. Some harpsichord makers are opposed to large feathers because, so they say, some of the sections become too flat to sound any different from delrin. True, it is important to keep the shape in mind: some sections from the back of gull feathers (what that is will be explained below) are in fact perfectly flat. It might indeed seem that this is the cause of their flat and hard sound. But the sound of this specific part of the feather is in fact caused by the coincidence that it also is exceptionally hard and springy - it is not the result of the flat shape alone. But even in its hardest parts, quill will always produce less mechanical noise than delrin.

Some also say that the feathers of sea birds are more sensitive to humidity changes. However, I have not noticed any real difference between quill plectra from various birds in this respect. It is a fact that most parts of a gull feather need to be cut thinner in order to sound well, but another thing is also true: in terms of durability, they easily outlive all other feathers that I have tested, while they can, in fact, be voiced in a nice way.

In view of the fact that the best and most durable material is lying about for free at the beaches of the world, I have never really understood why some people make such a fuss about using condor. It cannot possibly be easy to come by condor feathers, and then, why would one want to use them? I have seen a feather that came from a wild condor - it was enormous. They could perhaps be used for plucking piano strings, but not likely for much else.

Durability in practice

For someone used to gadgets that stay intact until they break beyond repair and are thrown away, quill plectra are a challenge: they deserve administration and an unfailing service mentality. This said, I normally don't have to replace more than two plectra a week in my most used harpsichord and that instrument gets it all: technical exercises, solo practicing and continuo preparations. As a professional player, I can maintain one large quilled harpsichord and three smaller instruments, and I still have time left over to practice, cook food and write blog posts.

The beginning and the end of the heating period will cause more plectra than usual to become brittle or too weak. Around two times every year, I will also have to look at the condition of the tips of all the plectra, because they tend to wear down more quickly than the rest of the plectrum. If one wants to estimate how much extra time one's commitment to quill would cost, one should realize that the material is much easier to cut (if one has a sharp woodcarving knife, see below) than delrin.

The total amount of time necessary to keep one's plectra in shape will in any case be a result of the level of one's commitment rather than a matter of one's choice of material. If one hates to fiddle with plectra or if one tends to work sloppily under pressure, one will probably need more time for the replacements, while the plectra produced in this fashion will probably be less durable.

How to proceed

The following is a description of how a bird's feather is prepared before cutting the plectra. Delrin users may read on nevertheless: the description further below of how the strips of material are transformed into individual plectra and the way these plectra are shaped are both largely the same for delrin and quill.

The drawings that accompany the following section were made for my original published articles on this subject. Three of them also appear in the voicing chapter (Chapter X) of Martin Skowroneck's book Cembalobau (Bochinsky 2003).

Preparation

The first step is to discard all those parts that cannot be used for plectra. We are only interested in the parts with an oval cross section (the shaft, Fig. 1, left) or half an oval (the back of the feather, Fig. 1, below right). The crossed-out parts are all discarded.

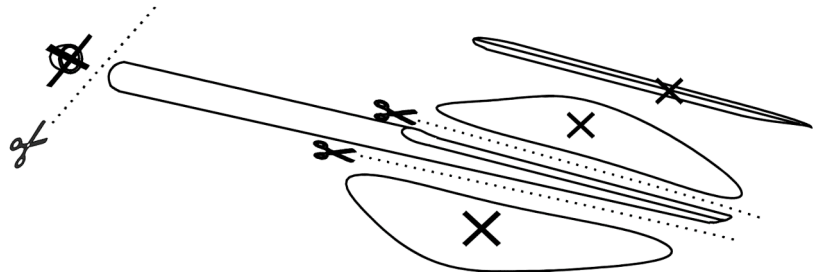

Fig. 1

Detaching the back of the feather from the to-be-discarded opposite side is sometimes difficult and potentially hazardous. This is work for a patient moment. The back of the feather is sometimes very hard, and needs to be scraped or cut much thinner. This might show up a second disadvantage of this part of the feather, namely its tendency to split lengthwise. The use of a sharp knife and a careful approach usually prevent these properties from becoming problems.

The cross-section of the oval shaft usually looks as shown in Fig. 2a.

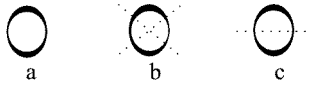

Fig. 2

This shaft can either be cut into four lengthwise strips (b), if its diameter is large or (in most cases) be halved (c). In the case of four strips, the rather thin sides can be used for the 4′ register.

Now we have created a number of strips of quill. One of the misunderstandings of plectrum making is the idea that one would have to cut the plectra before inserting them into the tongue of the jack - that one, in other words, needs to prepare the pre-fabricated plectra-shaped bits of quill (or delrin) before the real work starts. In contrast, it is *much* more practical to keep the strips as strips and to cut off each plectrum *after* inserting it into the tongue.

As an aside, I should here describe the proper manner of removing a broken plectrum from the jack tongue. A delrin plectrum will normally break so that about half a millimetre sticks out from the front of the tongue. Usually the only thing needed is a medium-sized screwdriver to push the remaining material back into the mortise. Now the end can be grabbed with a pair of pliers at the back of the tongue and the old plectrum can be pulled out.

Removing a quill plectrum that has become too weak requires a different approach, since normally, the whole plectrum is still in place, while it is in a weakened state where it tends to bend uncontrollably. One grabs the whole plectrum with a pair of pointy pliers from its front, leaving about half a millimetre (not more!) of space between the plier tips and the jack tongue. Grabbing the plectrum firmly, one now pushes it back into the mortise. Sometimes this action needs to be repeated for the end of the plectrum to emerge at the back of the tongue. Now the end can be grabbed and extracted as described above.

If one has the misfortune that the quill plectrum bends and twists and cannot be pushed back into the tongue, one cuts it completely flush with the tongue surface, puts a very small screwdriver right on top of its cross-section and tries to push the plectrum out. Move to a

good light source so you don't damage the tongue instead of pushing out the plectrum.

The first preparation, both for quill and for delrin, is to adjust the width of the strip so it actually will fit through the mortise in the tongue. Seen from above, one has to taper one end of the strip slightly, as shown in Fig. 3. I use a pair of small, sharp and pointy scissors for this job.

Fig. 3

If, after tapering, the tip is still too thick, one can - if one uses quill - cut the hollow side thinner with a sharp knife (if the plectrum has curved mortises, one should first find out at which point of the curve the quill is still too thick, and scrape precisely there).

To make a strip of delrin thinner, one puts it flat on a small cutting plank and, either by using a cabinet scraper or the knife blade (held perpendicularly to the strip), scrapes fluffy curls off the surface in a smooth and regular manner until the strip can be inserted into the jack. Often, the mortises in the tongue will be rather on the large side and one will not need much scraping or cutting.

Now the prepared strip is pushed from behind into the mortise of the jack tongue (Fig. 4).

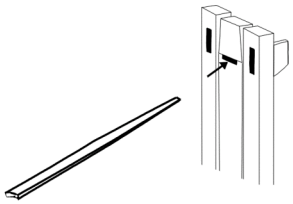

Fig. 4

Quill plectra have, naturally, their convex side on top. Delrin plectra should have the smoothest of the two sides (if there is any difference at all) on top. Push until the strip sits tightly, but don't use too much

force. If you are lucky, the tip that emerges at the front of the jack already has the proper length (this never happens to me).

Using the scissors again, one now cuts off the remaining strip close to the back of the tongue, allowing for about half a millimetre of material to stick out for future adjustments. After this, one presses the plectrum safely in place once more. Check the length of the plectrum in the instrument and cut it roughly to the required length with the scissors. If the plectrum still is too thick, that is, if it sounds noticeably too loud, one can cut or scrape with the knife along its lower side, taking care to take away the material regularly and not to cut any part too thin by accident. Very often, one now needs to fine-tune the length once more.

Using the knife and a small block of wood as support (actually, I rest the plectrum on my thumbnail instead), one now cuts the tip off at an angle, seen from the side (Fig. 5, left).

Fig. 5

The very last thing to do is to cut off the corners of the plectra as seen in Fig. 5, right. For a long time I used scissors for this work, but occasionally, one cuts off too much in this manner. I now usually use a fingernail file made of hardened glass. With this practical tool, I can smoothly round off the corners rather than just cutting them off.

When using quill, the cut-off corners are a *must*. Straight-cut quill plectra will - after some time - inevitably stop slipping back under the string upon release.

In delrin, the technique of cutting off the corners results in a noticeable improvement of the sound - so noticeable, in fact, that it is unfathomable for me why so many harpsichords lack this refinement. It takes the edge and sharpness off the tone without making it dull and indistinct, and it enhances whatever 'vocal' qualities an instrument might possess.

Things To Observe

I have mentioned this before: to achieve good voicing results, especially with quill, a positive attitude towards the work is absolutely necessary. If you tend to see voicing and harpsichord maintenance as a hassle, quill is not for you, even if many people exaggerate the problems connected with this material. If you have very little time available for maintaining your harpsichord, you are probably better off with delrin as well.

It is a good investment of one's time to learn from the start how to give a smooth finish to one's plectra. Most of the time, a newly inserted plectrum needs to be made somewhat thinner in order to sound good. One always only takes away material from under the plectrum. I use a standard-size woodcarving knife for this task which I keep very sharp (an instruction for sharpening, albeit for kitchen knives, can be found here). It is to a large degree a matter of taste whether one cuts the material or scrapes it thinner. When scraping, one must take care to avoid forming a wavy surface. This is achieved by occasionally changing the scraping angle. Cutting goes faster but the direction of the cut is difficult to control (especially in delrin). I have seen many people who tried to make one plectrum but ended up making three, because of their misdirected carving efforts (it is actually not a good idea to get all angry and frustrated when you have a sharp knife in your hand).

The first step in finishing off a plectrum is to check whether it is stiffer in one area than in another. I do this by manually bending the plectrum; it should bend in an even curve. I only take away material under the area that bends least of all. This is the fastest way to a good-sounding result, and it also creates a shape that is more durable, because the material gets more evenly stressed.

Voicing whole registers requires quite some experience. The most prominent danger when revoicing larger areas is that one loses one's sound-reference and gets gradually louder or softer. Another danger is

voicing each tone individually. If some areas of the instrument sound better than others, this would mean that they end up overpowering the weaker sections. This problem is, for example, typical for the ubiquitous five-octave mid-18th century French harpsichords, where the bass can be loud and sonorous while the tenor is often rather weaker. In situations like this it is necessary to find a voicing compromise that makes musical sense.

Non-structural problems

One of the things plectra like to do (doubtless with the objective of driving the harpsichordist who desperately needs to practice out of her or his wits), is to get hung on the string when returning (see also above). Most of the time, the reason for this is that the tip of the plectrum is rough (alternatively, the spring or bristle that keeps the tongue in place might be too strong). If we are talking about a delrin plectrum, it was probably rough from the beginning. Usually a wiping with forehead grease helps, otherwise one should try to carefully smooth the tip from below by using the glass file or very delicate knife strokes. Good light often helps to identify the cause of the trouble. Quill plectra, on the other hand, can get rough through use. One might need to push them through somewhat further and altogether re-shape their tips.

A typical problem in new harpsichords voiced in quill is that the fresh strings bite into the surface of the plectra and create a groove, which then produces a creaking and very forced tone. After a few months, the surfaces of the strings become slightly polished at the plucking point and the problem will subside. But this initial period of playing-in is sometimes rather trying. One must be prepared to repeatedly rub the top surfaces of the creaking plectra with one's fingernail and to occasionally apply some forehead grease.

I have experimented with strips of quill that I kept immersed in **oil**, with plectra that I oiled after voicing and with completely dry plectra. In terms of durability, I have not been able to find much

difference between these methods. Some kinds of vegetable oil appear to be bad for the strings as well, or they get sticky after some time. If one wants to apply oil, olive oil seems to be a safe choice. A very little oil on every plectrum is usually more than enough.

Structural problems, or: When Not To Use Quill

Not all kinds of harpsichords are suitable for quill plectra. Sometimes the mortises were designed to accommodate a specific shape of plectrum. Especially those that are higher than the maximal thickness of a strip of quill present a true problem: to jam the plectrum into the mortise so it gets wedged between its sides is ineffective: the plectrum can easily fall out again. In addition, quill plectra are not recommended in the following cases:

1). In harpsichords where the average length of the plectra is shorter than about 3mm. It is much more work to voice such short plectra properly, and they will always have a shorter life span.

2). In harpsichords where the plectra are mounted in the jack tongue at a clearly visible upward angle, instead of almost or completely perpendicular to the jack. I am aware of the fact that this is sometimes the case even in historical harpsichords. I believe that a slight angle can be very helpful: it enables the plectrum to slip back more easily and it guarantees a consistent and safe pluck, as opposed to one where the plectrum begins to slip off the string half-way through the attack. However, any exaggerated angle will cause the plectrum to grind itself into the string instead of plucking, and the resulting wear is many times greater than necessary.

3). In harpsichords that are played by very many different harpsichordists.

4). In harpsichords that are played by people with a very forceful touch.

Delrin and plastic jacks

I have occasionally encountered the problem that delrin plectra tend to slip out of some types of plastic jacks, because there is too little friction inside the mortises. The only way to solve this is to prepare the strip of delrin extra carefully: it should be infinitesimally thicker than the mortise in the jack tongue. The angle of the tapered tip, seen from above, should be as slight as possible. If the angle is steeper, it will inevitably drive the plectrum back out of the mortise. In this manner the plectrum is wedged into the mortise from all sides.