Most early technology is studied by modern researchers very much as an academic exercise firm in the belief that modern advancements are very beneficial to society. It is unlikely, for example, that anyone would like to undergo an "historically informed" medical operation under eighteenth or nineteenth century conditions. As humans now live longer and the medical profession is better able to identify and treat many fatal diseases it would seem to be the proof of that advancement. Similarly, although early motor vehicles are very attractive to look at and much admired in museums and specialist collections, there are few people who would relish the thought of travelling from London to Edinburgh in a turn of the century Benz. Nor would people wish to fly from England to Australia in a 1930's aeroplane given the far greater comfort and speed of a modern 747.
Even around the house, most people gladly forsake old living conditions and choose to be with their electricity, telephone, television, hot running water and inside bathrooms. The use of an electric light is much better than a candle, and electric or gas heating is generally much more convenient than an open fire. Modern upholstered or ergonomically designed furniture is often much more comfortable than that in use several centuries ago.
Perhaps the only two fields where technology from the past are used involves working objects the first being clocks, where a late seventeenth or eighteenth century long case clock is considered not only a beautiful object, but is also perfectly capable of carrying out its original function of telling people what time it is to a high degree of accuracy. The other field is musical instruments.
Most modern musical instruments are directly descended from renaissance counterparts, sometimes in a form close to the originals, for example the violin, whose changes are musically important but visually unobtrusive to the lay-person. Many brass instruments - the trumpet or French horn, for example, are now much altered from the instruments of two hundred years ago. The renaissance and baroque trumpet or French Horn is one of the simplest musical instruments, consisting of a rolled tube of brass with a flared end, and a mouthpiece you blow down, whereas the modern instruments have a large variety of valves, pistons, tuning slides and the like.
Keyboard instruments have also developed during the past three hundred years. The harpsichord of 1700 was usually a simple instrument with a couple of sets of strings, each string plucked by its own plectrum, and had a range of about four octaves, usually with only a single keyboard. The modern grand piano, on the other hand, has a solid iron frame, a range of over seven octaves, up to three strings for each note, pedals, and much more power. I had the experience several weeks ago of having to carry a lid of a grand piano made earlier this century and found that it weighed more on its own than an entire Italian harpsichord does. Needless to say, it is impossible for a single person to move a grand piano with much ease, and even difficult for a pair of piano removers to put a piano onto its side. Even the largest historical harpsichord can be moved by two people without great difficulty.
The harpsichord and its related instruments the virginal, spinet and clavichord fell from use at the end of the eighteenth century. Most of the reason for their decline was due to the inability of the instruments to play with contrast in volume which was a necessity of the new music of composers such as Mozart, Haydn and Beethoven. The keyboard instrument that replaced the harpsichord, the fortepiano, was perfected by Cristofori in Italy in the first decades of the eighteenth century, the oldest surviving example is dated 1720, and soon gained in popularity throughout the rest of Europe, early examples by Silbermann of Germany are datable to about 1745, the earliest English made grand piano is 1772, although square pianos were made from a decade earlier, and the harpsichord maker to the French King, Pascal Taskin was making pianos before 1790.
The arrival of the piano was matched by workshop changes and an increase in production line methods. The busiest of the harpsichord workshops such as that of Kirckman in London made perhaps 50 harpsichords a year in the 1770's and 1780's. By contrast, at the turn of the century the Broadwood factory, which only had half the harpsichord output of Kirckman, were making about 1000 instruments a year. Even the Viennese workshops, making a product which had a more complicated action and set-up, often with four or five pedals operating special effects such as cymbal stops, bassoon stops and drum stops were producing about 100 grand pianos early in the nineteenth century.
The development of the piano was much faster than that of the harpsichord, and by the 1870's the grand piano essentially as we know it today was perfected. It was around the same time that there was a renewed interest in earlier music, and in the 1880's the Erard workshop in Paris made the first attempts at reproducing harpsichords for sale to the public. The instrument that they based their design on was made by Pascal Taskin in 1769, and is now in the Russell Collection in Edinburgh. Naturally it wasn't lost on these early reproduction harpsichord makers that the harpsichord fell into decline in the first place because it was unable to compete with the piano. Therefore, quite naturally, these early makers tried to ensure that the problems of the harpsichord would be overcome. The first, and most obvious improvement was the introduction of pedals. Although it was more-or- less impossible to create a harpsichord that could have adjustable dynamics like a piano, the harpsichord had the capability of many different tone colours which a piano can't emulate. The use of pedals rather than the historical handstops enabled players to quickly change from one tone colour to another.
As an aside it can be noted that in the 1920's there were attempts to go the other way and introduce tone colour changing capabilities to the grand piano. There are a number of surviving pianos which follow the design of Emmanuel Moor and have two manuals, the upper manual playing an octave higher than the lower manual, plus a foot pedal for playing both keyboards together, and a handstop which moves some metal bars so that when a key is depressed the hammer hits the metal bar instead of the string and these bars then hit the strings, producing a sound not too dissimilar to that of a bad harpsichord.
The harpsichord soon became standardised in its modern form with four sets of strings, two at normal unison pitch, one an octave higher, and another set an octave lower. In addition there was another set of jacks, the mechanism that plucks the strings, which were close to the end of the strings producing a very nasal sound. The instrument usually had several buff battens, which hold little pieces of leather which come in contact with the strings damping the upper partials and producing a sound not dissimilar to that of a lute. The plectrum material was leather rather than quill which was common in the original instruments. Leather had the advantage of being able to give different volumes depending on how much protruded past the string and how thick it was, so instead of having a pedal which merely turned the set of strings on or off, the pedal was made to half hook, to give a softer or louder sound depending on how far the pedal was engaged. Needless to say, the piano makers used other advancements as well. The iron frame, used in most pianos from the middle of the nineteenth century was adapted for use in the new harpsichord, and the strings were of carbon steel, stressed very high in an attempt to produce a loud volume. The soundboards were also copied from their standard piano practice being over a quarter of an inch thick, rather than the one eighth commonly found in the historical harpsichord. The keys themselves were copied from the piano and similarly weighted so that pianists would feel comfortable with the new instrument.
Until the mid-1960's this type of hybrid instrument was almost exclusively used by performers in concerts and recordings. Occasionally performers would use original instruments in museums, more as academic exercises than anything else, and occasional instrument makers would copy original instruments fairly closely rather than make the large instrument that was familiar. Frank Hubbard and William Dowd in Boston, Massachusetts, and Martin Skowroneck in Bremen, Germany started independently making historical type instruments around 1950.
Around the mid-1960's there began to be a change in the public's perception of earlier types of music and how it was performed. Several reasons can be attributed for this. Firstly, there were a number of young musicians who were capable of playing earlier instruments comparatively well and were charismatic figures themselves. David Munrow is the first that comes to mind; others include Chris Hogwood, the Kuiyken brothers and Gustav Leonhardt in Holland. These musicians played on original instruments, or copies which were much closer than previous attempts. Secondly, there was a rise in the value of these old instruments as educated people started collecting them. There is little point in making a copy of something if it will sell for the same price as an original. In addition to the musicians playing old instruments there was a number of people attracted to copying them, partly as a result of the late sixties philosophy, and partly because there were several books appearing, most notably "Three Centuries of Harpsichord Making" by Frank Hubbard which pointed out the differences between the original and more modern instruments and gave many unknown details about the original harpsichords. Kits for people to build their own approximations of historical instruments were starting to be advertised at this time. There was also an increased audience for early music which mirrored the rise of folk clubs and the like, bringing the start of a generation who wanted to be different from the older people around them.
By the mid to late 1970's early music had been transformed and there were a comparatively large number of makers, all building instruments closely inspired by originals, usually from published technical drawings of instruments in museums. Even today this is the most common source of details about original instruments used by harpsichord makers. The validity of historically informed performance is no longer questioned, anyone listening to Radio 3 is likely to find a Beethoven symphony played by a period instrument orchestra rather than a modern symphony orchestra such as the CBSO or the Berlin Philharmonic. It is rare to hear Bach keyboard works played on a piano rather than a harpsichord, and music which was previously hardly ever performed - French harpsichord music or that of the sixteenth century English virginalists is now also heard on originals or reproductions.
Therefore, unlike working objects such as clocks, a musical instrument is reproduced in order to replicate as closely as is desirable the characteristics of the original object. It is now seen that the harpsichord should aim to emulate the originals they copy so that the music played will be closer to what was originally heard.
It is always difficult with such an approach to know how close to the original objects in order to satisfactorily achieve the objectives. But the general consensus that historically informed performance is a goal to be strived for requires the subject to be considered.
The logical approach, of course, would be to use original instruments. Many original harpsichords exist and have been restored to playing condition. Unlike violins, where Stradivarius violins are altered and played by modern performers, early keyboard instruments often still have a close resemblance to how they survived following their decline at the end of the eighteenth century. The problems with using these original instruments are obvious. Firstly, there aren't enough to go around. It is estimated that there are perhaps only 4000 surviving early plucked keyboard instruments. It is likely that there are several times that number of modern reconstructions that have been built to satisfy the demand. The other problem is that the surviving instruments often don't represent the original work of the maker. Of the estimated 4000 instruments perhaps only about 1%, roughly 40 instruments remain in an unaltered original condition, although considerably more could be returned to emulate that condition. But to restore an instrument to the original condition requires the knowledge of what the original state was. All researchers involved with early keyboard instruments bemoan the lack of original ephemera to give important details about the instruments.
Even if the simpler questions can be answered, the questions that need answering now in many cases cannot be answered particularly well at all. Very few instruments retain original strings, and very little is known about historical pitch standards. Therefore details such as string tension cannot be answered very satisfactorily. This has an obvious effect on the tone of an instrument, and in the case of a clavichord, where a brass tangent attached to the end of the key comes into direct contact with the strings the tension has a great bearing on the playability of an instrument. Other questions need answering as well. How far down should the key be pressed before the instrument sounds and when it comes to rest? In what order do the different strings sound? These questions are very important to musicians, and can only be answered by close examination of original instruments. This means that antique harpsichords are a type of laboratory. If musicians play these old instruments then the information which is considered essential for their music will be lost. The other question that concerns old instruments is even more difficult to answer. What did the instruments sound like when they were new? Did they sound much the same as they do now, or has time altered their sound and playing characteristics?
It is of course impossible to come up with a quantifiable answer to those questions. It can be shown that the wood has changed in the two or three hundred years since the instrument was built. There are chemical changes, and the physical characteristics also change. If a soundboard of an old harpsichord is removed in restoration it will often show the inevitable result of hundreds of years of tension and will be deformed and twisted. This must affect the way the wood, which acts as a radiator of the sound, responds when the instrument is played as the twisted and deformed wood will have a different stiffness compared to when it was first built into the instrument. It is effectively impossibly to imitate these effects in a new instrument and so therefore any change of sound and response can only be theorised about and not proven. There is no denying that many old instruments have wonderful sounds, and playing these old instruments is a very enjoyable experience, even if it is only because the instruments are several hundred years old, yet it is probably fair to say that we are not hearing the same sounds that were heard by musicians when the instruments were new. The logical use of original instruments is therefore shown to be based on a possibly false premise, and in any case damaging in the long term to the full understanding of the music and its performances. Yet often musicians, and others argue that using reproductions of early instruments is little better. The Taskin harpsichord which was first copied by Erard back in 1882 is surely the most copied harpsichord in the world. Most international performers find themselves playing copies of this instrument, and almost all point out that very few copies ever sound alike. Therefore the copies are not necessarily the best way of judging the sound of an original instrument either.
In trying to re-create an old tradition it is often difficult to not be influenced by our own traditions and ideas. In the normal course of events this presents no problems and the objects we admire from the past are often admired because their creators had a similar aesthetic ideal to ourselves. It is rare that old instruments are copied with their most extreme styles of baroque decoration for, quite aside of the cost, there are few people who actually want to live with a nine foot long object which has an elaborate carved stand covered in gold leaf and high baroque interior lid paintings. Most people choose a fairly simple decorative scheme, though often closely inspired by or copying original styles that are more pleasing. A discussion of sound is equally subjective, and much harder to quantify.
There are very few modern instruments that I have heard which sound very close to the originals they copy. It has been argued that it could well be because modern makers don't attempt to scientifically reproduce the original instruments, and I am personally sure that is a large part of it. Much has to do with how instrument makers see themselves. In the seventeenth and eighteenth century harpsichord makers were considered artisans, providers of tools. It was an approach that extended to fields that we consider high are today - painters and sculptors were also regarded, and regarded themselves essentially as artisan workers. There has been a change of philosophy so that today these people are "artists" to be admired for there ability, and many musical instrument makers consider themselves in a similar class.
In this context makers will use the drawing of the original instrument they copy as a basis. Often the first attempt at building an instrument of a new model will be quite close to the details on the technical drawing, although it is very rare to find a maker who will copy even very important details such as soundboard thickness from the plans - this is part of a maker's art. Following the completion of an initial instrument the maker and players will listen to the resulting instrument and often suggest changes. Perhaps the bass could be improved, or the sustain. The maker can change his plan to take these changes into account in his next copy. This is an ongoing process, and after three or four instruments the result is naturally considerably different from the initial instrument. This is usually a demonstration of how the modern idea of sound is an over-riding force, the maker produces his own instrument which he feels is superior to the instrument produced when working much closer to the plan drawing. This goes back in a way to the path followed by the early revivalists with their iron frames and pedals. The essential question is "how do you know that the resulting instrument has been developed in a way similar to the original and retains its integrity?" Even in our own time we can see examples of this. Electric guitar makers have introduced variations on their popular models through the years. Regardless of how the makers have seen the alterations most players tend to be against them. As a result, manufacturers like Gibson and Fender have been forced to introduce "Vintage" instruments, copying particular originals, and nowadays it is these instruments, despite the greater cost to players, that form much of the maker's output.
In trying to re-create tools to be used for the music of the past it seems that the only real approach would be to try and reconstruct the original instruments as closely as possible. The first method of doing this would be to build instruments as strict copies of the originals, using all dimensions and other details, in order to create what is in effect a facsimile. There are obvious difficulties with that approach, mostly down to the skill of the modern craftsman, and a fear that reproducing the rough workmanship of the original will result in instruments which are difficult to sell.
There are other problems with that approach as well. It was realised early on in the early music revival that the pitch the music was played at is different to the modern pitch of today. The solution was to decide on a standard pitch for early music, and for the sake of convenience a pitch exactly one semitone below modern pitch was used. This meant that reproduction harpsichords could be fitted with a transposing device so the keyboard could slide from left to right, playing at the so-called baroque pitch in the lower position, and modern pitch when slid to the right. Of course not all instruments were designed for the same pitch and it is not unusual to find original instruments which were designed for modern pitch or even higher which are being reconstructed as though they were originally at low pitch. The effect is that the strings aren't stressed to their correct levels and the tone therefore suffers.
Other instruments have the same problems, which often require even more drastic solutions. Recorders and flutes often have to be re-scaled to play at different pitches, likewise trumpets. It is not very often that modern makers make systematic studies of old instruments in order to find out how the original craftsmen faced such problems. By not following the original design principles the instrument is built along different lines with a different tonal result.
Increasing over the past five or ten years research has been looking at the reconstruction of early musical instruments from a different viewpoint. By close examinations of large numbers of original instruments carried out in a systematic manner a number of researchers have developed ideas concerning the original design concepts and constructional methods in historical instruments.
It can be shown that original instruments are not identical to each other, so although the modern approach of using a technical drawing and copying the instrument in that manner may produce a close facsimile of a particular instrument it is more valid to use the technologies of the past and reconstruct instruments in the same manner as the original builders. Much modern research work is being carried out by practical makers, rather than museum curators and it is this different approach which has shed the most light on original practices.
It must be said that many of the original working techniques are far easier than their equivalent modern approach. Modern makers are assisted by electric tools, ranging from portable tools such as drills, routers and jigsaws to large planer-thicknessers, circular saws and bandsaws. There is no denying that using a planer-thicknesser, for example, makes the reduction of stock timber a far quicker and simpler proposition. When faced with not having access to the large machines several years ago I was forced to thickness the case of a large clavichord by hand and found the job took about 16 hours. Doing the same job with a thicknesser would take less than a half an hour. It is a practical experience like that which clearly shows one of the basic philosophies concerning the approach of original makers - never do more work than you need to.
The other philosophies are found by the studying of the old instruments. The first is that the designs should be simple - in the modern times we can make drawings of the instruments which can easily be changed on paper. The original makers didn't use drawings as such. If they deviated too far from what they knew it was likely they would have problems. During my research on seventeenth-century English virginals I found an instrument which was different from the norm. In particular the compass was very low - although the instrument has 55 notes like most of the instruments at the time, the lowest note is an F instead of the usual B or C. As the maker was concerned with having the instrument play at the normal pitch of the time he was forced to deviate more than he would have liked. His approach was one of caution and simplicity. The entire instrument was laid out, from first principles as it were, and used common measure to ensure the design was in his control. His concerns were that the instrument would be able to work musically and also that it would function reliably. This is the second rule that seems to be applied by old instrument makers. The instrument must work as efficiently and as straightforward as possible. It was far more important to the original maker that the strings of a harpsichord or virginal passed right in the middle of the jacks which hold the plectrum than having the strings of an exact length.
Without having technical drawings it is obviously difficult to determine fully such things as the strings lengths and provided they were close enough that the instrument wouldn't suffer musically - something that is discovered from experience and would be known to any maker that had of spent the customary seven years of an apprenticeship - the functionability became the more important feature.
An example of this can be shown by looking at the methods used by Robert Hatley, the maker of the virginal I have just mentioned. Hatley's case dimensions were probably decided as the starting point and he chose an overall length of 5½ feet. This was probably his standard case length which he used even though he had altered the compass. The width of the instrument was probably also his normal design length, 1'8½". The case depth again was probably his standard design, and is 9". The features that Hatley then had to work out were the length of the strings so it would sound musically acceptable, the point along the strings where they were plucked - not too nasal that the sound was harsh or to central so the tone was harmonically indistinct, and the position of the strings on the bridges so the instrument functioned properly.
In any well-established workshop the makers would have templates for things such as the curved right-hand virginal bridge, and to mark out the position of the register holes in the soundboard where the jacks come through. Hatley probably started by positioning his bridge template on the baseboard which he had already cut out from the above dimensions. With that in a rough reasonable position he marked the most extreme left-hand position of the bridge and then using a ruler from the right-hand end of the baseboard marked the position to the nearest whole inch. He knew that that was to be the inside edge position of the brace that runs from the front to the back of the case, and therefore he knew that the instrument would function properly. With that bridge in its position he would have put his register template on the baseboard to act as a guide and then he could use a long straight edge marking stick to determine the position of the other bridge on the soundboard. He probably used only three or four string lengths as guides.
Once he was sure his new design would work he could repeat the exercise in building the instrument himself. Rather than the plans modern makers use today old workshops made much use of marking out sticks for things like the keyboards and for the positioning of the pins on the bridge. These have the advantage of firstly taking up less room, and secondly of speeding up the processes that use these sticks. Using the marking sticks and a few measurements that he determined when using the baseboard to lay out his design he is able to quickly and simply build his prototype new model. Simplicity was also very important as, unlike today, Hatley would have had several assistants who would probably have had limited education and literacy.
The length of the right hand side had been determined previously by positioning his bridge template on the baseboard, and Hatley would have then positioned his keyboard marking stick on the baseboard and after giving a suitable clearance for the blocks at either end he was able to decide on the length of the left hand end, again using an integral number for simplicity. The rest of his case design was straightforward following his normal type of layout and could easily be carried out by his apprentices.
By using the right-hand bridge template as the starting point of the design on the baseboard Hatley knew he would have no problem in actually position the pins, used to keep the strings in place on the bridge. After the bridge was made and glued to the soundboard the spine would have been placed against a flat wall or something similar at the back and another marking out stick would be used to mark out the pin positions on the bridge. Looking at the instrument it is easy to see the pin marks made as the guide when the bridge was laid out. The actual pins were positioned either side of these pin marks. The marking out stick again uses a simple layout, each octave divides into a certain number of inches or half inches so the strings get further apart towards the bass.
The register template is then put in position on the soundboard and the register slots are cut out and then covered with leather. As a guide to ensure the strings are placed in the centre between the slots in the soundboard a pinprick is marked onto the leather between each wide pairs of slots. Using the right-hand bridge and the register slot pin marks the left-hand bridge can be positioned using two or three string lengths as a guide. Hatley designed his instrument to be at choir pitch, the same pitch standard as most of the organs of the period, and knew that the top c string needed to be six inches long to achieve that pitch. If he had wanted the pitch to be a semitone higher he would have made the top string 5½ or 5¾ inches long, and if he wanted the instrument to be a semitone lower he would have known to make the string 6½ inches long. Almost all original instruments can be shown to have string lengths worked out in a similar manner by using the unit of measure in use in the place where the instrument was built.
The lowest string is exactly 5 foot long, which is another simple measurement for the maker to work to and remember. He probably used the c an octave below the top string as his other guide and decided on a length of 10½ inches. The left hand bridge would have then been glued to the soundboard based on those measurements and the left hand bridge pins placed in the bridge using the soundboard leather pin marks as guides to get the strings in the correct lateral position to ensure the plectrum could be as long as possible. It follows that none of the other string lengths were particularly designed or measured as such. It also follows that two different instruments by the same maker will have strings of different lengths according to slightly different bridge and soundboard slot positions. This is very noticeable in the instruments of other builders who have left several examples which appear to be built on the same designs. In some harpsichords for example, instruments built in the same year and to the same design have string lengths near the bass which are up to 40 millimetres different. That distance sounds large as a linear measurement, but represents about 2 or 3% of the total string length which in musical terms is negligible.
I have been able to describe fairly simply the design methods and measurement used in one specific instrument, and to copy reconstruct that instrument following the original makers methods I would need nothing more than a yardstick, a bridge template, a register slot template, a keyboard marking stick, a right-hand bridge pin position marking stick and a list of perhaps a dozen measurements. If I were to make that reconstruction the resulting instrument would not be a dimensional copy of the original instrument, but would be as close as another instrument by the same maker using the same design. It would also be possible to alter the instrument to play at a different pitch without much difficulty by adjusting all of the measurements to be correspondingly smaller or larger.
This approach has historical validity and can be seen in the instruments built by the Ruckers family in Antwerp during the seventeenth century. The Ruckers family built instruments at eight different pitch levels all following the design concepts I have discussed above and using different basic measurements depending on the desired pitch. For example, virginals at the standard "reference" pitch are six Antwerp feet long, those pitched a tone higher are five feet long, those a fourth higher are four and a half feet long and so on. The string lengths correspond in the same manner. These instruments were built in the same manner I have described for the English instrument above and again would require the same type of jigs, templates and marking sticks. It is estimated the the Ruckers workshops were producing about 40 instruments a year, so the need for simplicity is obvious since it is impossible for the master to be involved in all the aspects of construction.
Other types of instrument show similar approaches to design and construction. Even the violins of Stradivarius were made following simple construction methods. The object for the makers is to produce a product of consistently high standard. Of course individual instruments will be of a far better tonal quality that general, and similarly other instruments will be comparatively disappointing. This is due to features which can't be controlled by makers - part of what can be described as the mystery of the craft. It still occurs today for even if a maker is constantly adjusting his designs in an attempt to improve his product he will find the odd disappointment that can't be explained.
It is fair to say that modern makers are probably unable to make true authoritive judgements about the quality of their instruments or particular designs. A modern harpsichord maker will very rarely be able to build more than four or five instruments in a single year and would therefore take ten years to match the output of a single year from the Ruckers workshop. Therefore modern makers are just not making enough instruments to make valid judgements. Yet modern makers tend to make changes to their designs quite frequently. The original makers often used the same basic design for years on end.
Part of the reason for the different approach between modern makers and those of two or three hundred years ago can be traced directly to the different technologies used. A modern maker using large machines is much better suited to accurate machining of individual parts that are specified on a technical drawing. Old makers without those facilities made parts to fit what was already there. Naturally if a modern maker is slightly inaccurate in some parts he will be faced with problems as he continues, and in my experience much of the time spent building instruments is modern workshops is spent trying to get around unforeseen problems that occur because of earlier stages of work, and I have seen a number of instruments that are very difficult to play due to these inaccuracies being exaggerated as the work progresses. In contrast, playing original instruments is usually very easy and they tend to be very maintenance free and reliable. I certainly wouldn't advocate a return to the quality of workmanship found in original instruments which is often quite rough, nor would I ever return to using a hand plane instead of a thicknesser for an instrument case.
But there is evidence that original instruments sounded different when new from those modern copies. The high accuracy achievable on modern wood and metalworking lathes can result in instruments which behave acoustically different to the original counterparts. For example, original trumpet makers tended to taper the joints of their instruments and sealed them with beeswax whereas modern makers produce tight machine fits which increases the structural strength of the instrument and appears to have a noticeable effect on the tone. Most recently it has been shown that the wood used for soundboards of old violins had only been out of the trees for a couple of years in many cases. Modern practice is to use wood which is well seasoned, preferably for over ten years. Yet it has been suggested that the original makers immersed their soundboard wood in boiling water for a period of several days to a week, and modern experiments have shown that this chemically alters the wood, breaking down the cellulose which affects the sound.
In the reconstruction of early keyboard instruments there are many aspects which if not followed correctly alter the sound of the instrument. The use of wire of the correct material, thickness and tension has a great importance as does the use of the right plectrum material. The length of the plectrum material, always quite long in original instruments plays an important part in both the ease of playability and tone. The use of original balance ratios also affects how an instrument plays and consequently how a musician responds to the instrument. As musical instruments are used as tools to recreate an early music which is as historically informed as possible it seems only sensible that the instruments themselves are recreated using original technologies as well.