AITCHISON MNATZAGANIAN
CELLO MAKERS RESTORERS & DEALERS

AITCHISON & MNATZAGANIAN ARE DEDICATED CELLO SPECIALISTS. Based in Ely, Cambridgeshire, we provide cellists with a unique and comprehensive service, focusing our expertise on every aspect of cello care:

SOUND ADJUSTMENT. Luthier Robin Aitchison is well known for his exceptional gift for set up and sound adjustment.

STRING TRIALS. We offer a unique string trial service which gives players an opportunity to test a wide range of cello strings. We fit the strings and advise the cellist throughout the trial. String trials also include a full check up of each cello's set up. The cost is £25 (free to students).

STOCK OF FINE CELLOS. We offer fine cellos for sale which have been fully restored and professionally set up in our workshop. We also provide a "cello exchange" service to help players find new homes for their instruments at a modest 10% commission. Robin Aitchison accepts commissions for new instruments, which are closely studied copies of fine originals by makers including G.B Guadagnini and Antonio Stradivarius.

TAKE A BOW. We hold a biennial exhibition of contemporary cello bows by international master bowmakers. *Take a Bow 2005* runs from 1 October to 14 November 2005.

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TEL: 01353 668559 · EMAIL: info@aitchisoncellos.com
www.aitchisoncellos.com

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Cello Care Guide

By Robin Aitchison and Sarah Mnatzaganian

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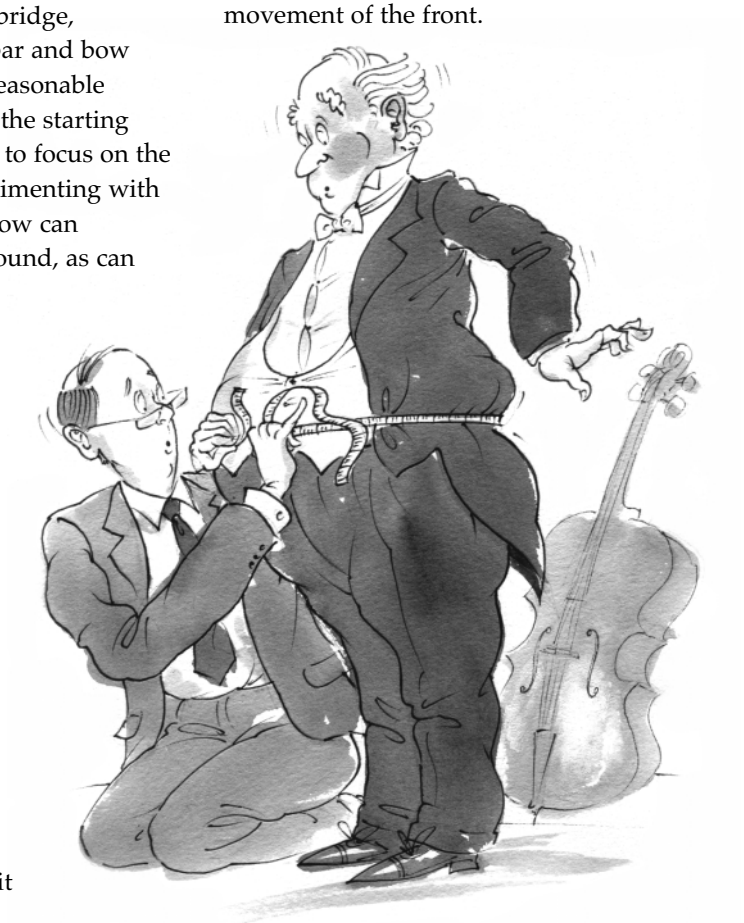
CELLO SET UP

A tailor-made set up will take into account your playing style and physical strength and can dramatically improve both your playing comfort and the response of your cello.

The set up of a cello encompasses all the parts of the instrument which can be adapted to suit a player's specific needs and includes the pegs, strings, nut, fingerboard, neck, bridge, tailpiece, endpin, bass bar and bow hair. If the cello has a reasonable bridge and sound post, the starting point for set up work is to focus on the bow and strings. Experimenting with strings or re-hairing a bow can revolutionise a cello's sound, as can re-gluing seams.

The second level of enquiry is to improve the tone and response of the cello by fitting a carefully designed bridge and sound post. A good luthier will consider both the playing style of the cellist and the character of the cello when designing a bridge. The sound post has such a profound influence on tone and response that in Italian it is known as 'anima' or soul of the instrument. A luthier will 'tune' the body of a cello with the sound post as carefully as a player tunes the strings. More extensive work is needed for the deepest level of set up which includes work such as re-setting the neck to correct problems of elevation and alignment and fitting a new bass bar which controls the stiffness and movement of the front.



"A tailor-made set up can dramatically improve your playing comfort."

DAY TO DAY CELLO CARE

THE BRIDGE

The ideal bridge is cut from the finest seasoned maple. It holds your strings at an optimal height above the fingerboard and allows even bow clearance between each string. The strings lie in carefully shaped and lubricated grooves of up to $^1/_3$ or $^1/_2$ of their depth and the A and D string grooves are protected by vellums (small pieces of natural parchment glued to the bridge underneath the top strings). The bridge feet are cut to fit the cello front and the bridge stands perfectly upright so that the power of your playing is transferred directly into the body of the instrument.

Check the angle of the bridge on a weekly basis. Depending on how you tune your cello, the bridge will get dragged towards the pegs or the adjusters as the strings slide over their grooves. If the bridge does not sit evenly on its feet, there will be an immediate change in the response of the cello and the bridge may begin to warp. It can be difficult to spot a slightly leaning bridge so you could ask your luthier to cut you a wooden gauge which fits exactly between the end of your fingerboard and the top of your bridge when it is standing correctly.

Straighten the bridge if necessary. If the string grooves are well lubricated and shaped to fit your strings, you should be able to move the bridge under the full tension of the strings. If your string grooves are lubricated but the bridge will not move, your grooves may be too narrow or deep and you will need to ask a luthier to correct them. If all is well, firmly grip the bridge with your fingers and thumbs just beneath the strings to straighten. If in doubt, ask your luthier or teacher to demonstrate the technique.

Given practice, straightening your bridge can become quick and painless and should be as integral a part of preparing to play as rosining the bow.

Lubricate the string grooves at the bridge and the nut by rubbing pencil lead or dry soap into the string grooves as this minimises friction between string and bridge. Re-lubricate whenever you change a string. Try to tune using your pegs as the bridge is designed to withstand a pull from this direction.

Keep an eye on your bridge position. The position of your bridge in relation to the sound post will radically affect the tone of your cello. If your cello has been knocked, you may need to ask a luthier to check your bridge if there is no imprint of the bridge feet in the varnish showing you the original position of the bridge.

THE SOUND POST

The perfect sound post is cut from carefully selected, split spruce and expertly fitted so that it transfers vibration from the bridge and front into the back of the instrument.

Sound posts need to be fitted and adjusted to suit the individual cellist as different players have totally different needs. Some soloists who use a lot of bow pressure will need plenty of support and so will have a relatively long post fitted. However, there is no hard and fast rule; if you use bow speed rather than pressure to create a big sound, then you may need a less tightly fitting post.

If the sound post falls over, slacken off the strings immediately as the unsupported front may crack or distort when under tension.

FINGERBOARD

The ideal fingerboard is scooped along its length to give a clear and even sound and the surface is smooth, allowing precise intonation and perfectly tuned fifths across the strings.

To check the amount of scoop in a fingerboard, press down each string at both ends of the fingerboard and observe how much gap is left beneath the middle of the string and the surface of the fingerboard. The scoop should be at its shallowest under the A string and become progressively deeper towards the C string. As a general rule, the scoop should have the same depth as the thickness of the C string.

Check the join between the fingerboard and neck as fingerboards do occasionally become unglued in places. If so, the neck will quickly warp and string heights increase dramatically. If your fingerboard looks rough or uneven, ask a luthier to "true" or "shoot" it for you.

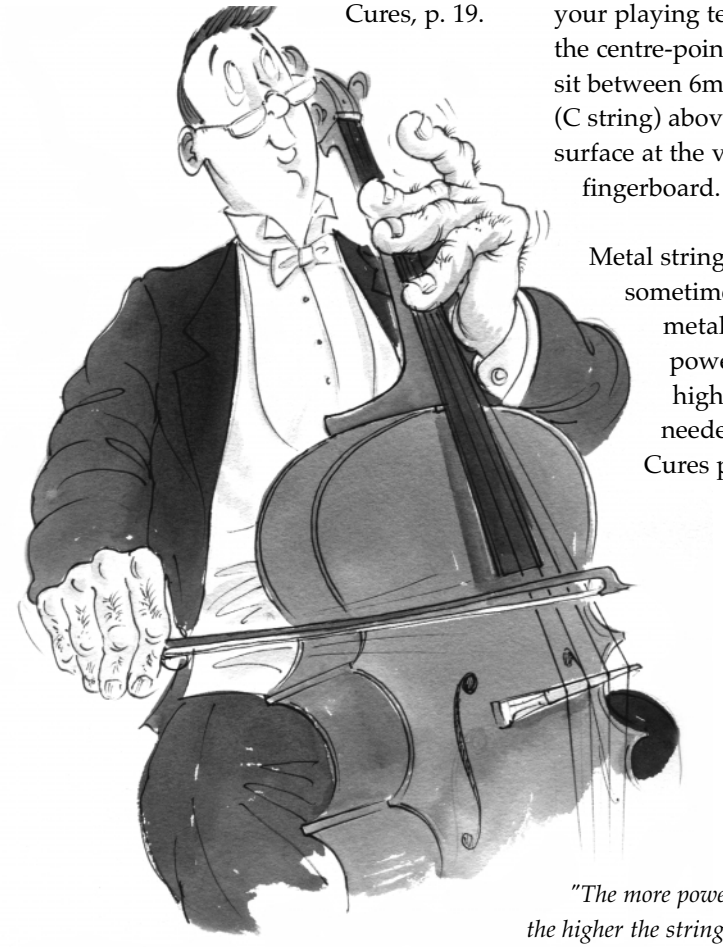
NUT

The perfectly functioning nut is expertly shaped to provide a smooth, gradual transition for the string from the peg box to the playing area. The string grooves are filed to the exact shape of each string, allowing only one third of the string's depth to lie inside the groove. The nut is at the right height and allows just a little clearance between the string and the top of the fingerboard.

If you change string type, ask a luthier to check that your new strings still fit the grooves at the nut and the bridge.

PEGS

Good pegs will turn easily without slipping or sticking because each peg and hole is circular and evenly tapered and is treated with a semi-lubricant paste. The larger hole is a little tighter on the peg than the smaller hole, to allow for control in tuning. For more on pegs, see Cello Cures, p. 19.



"The more powerful the cellist, the higher the string clearance needed."

STRING HEIGHTS

If all is well, your strings will feel comfortable under the fingers but won't buzz or clatter on the fingerboard when you play fortissimo.

Preferred string clearances depend on the type of string you use, the shaping of the fingerboard and the demands of your playing technique. On average, the centre-point of your string should sit between 6mm (A string) and 8.5mm (C string) above the fingerboard surface at the very bottom of the fingerboard.

Metal strings are set lower (e.g. sometimes as low as 4mm for a metal A string). The more powerful the cellist, the higher the string clearance needed. Also see Cello Cures p. 20.

STRINGS

Ideally, your strings will be fresh and their tone will complement and balance the character of your cello.

Replace your strings regularly as they are almost always more powerful and pliant when they are new. Some strings may tail off in tone quite quickly while others may last for a long time. Different strings also take varying times to play in. If you are on a tight budget, consider replacing upper strings more frequently than lower.

Some players find it helpful to change just one or two strings at a time, to avoid a feeling of disorientation and to help check that no new string is defective.

Try the luthier's crossover technique when fitting strings. Fit the ball end of the string to the tailpiece or adjuster. Taking care not to twist the string, thread the string into the peg hole, allowing just a few millimetres of the tail end to emerge beyond the peg.

Wind the string evenly onto the peg for two turns, travelling towards the narrower end of the peg, then wind the string back over itself and in the opposite direction (towards the fat end of the peg) until the string is tight enough to tune. This crossover encourages the string to 'lock' itself onto the peg and helps to stop it from slipping.

The string should end up next to, but not squashed against, the inside of the peg box. The windings should travel evenly along the peg and not go over each other except where the string crosses itself as you change the direction of the winding. Take care not to tune the string higher than its intended pitch as this can damage the string.

Experiment with strings. The choice of strings is fundamental to the colour and quality of the sound you produce, just as the choice of loudspeakers influences the performance of your hi-fi.

Each cello is unique and could well sound at its best with a combination of different string types. The choice of upper strings is especially important, as a dark sounding cello will need bright upper strings to speak well, while a very bright instrument will need smooth, dark top strings. If you do decide to change your strings, ask a luthier to adjust your string grooves at the nut and bridge.

ROSIN

It is best to avoid the very cheapest rosins as they give very poor results.

Use rosin regularly and moderately. Apply one lick down the bow for every practice session and a double lick for a day's work. Too much rosin produces a rough, gritty sound and makes smooth bow changes difficult. Too little rosin makes it difficult to play into the string and good staccato becomes impossible.

Clean the rosin off your strings with a duster each time you play. If rosin builds up on your strings it will interfere with their tonal response. If you can't remove rosin with a duster, you may need to use a tiny amount of solvent (perfume, meths or surgical spirit) on cotton wool. Before you attempt to clean the string, protect the front of your cello with a clean dry cloth. Make sure you cannot wring a single drop of solvent from the cotton wool, as any drips will damage the varnish. Throw away the cotton wool immediately and wash your hands before touching your cello again.

"Use rosin regularly and moderately."

BOW

Looking from above down the bow towards the tip, the bow should be straight or in some cases bend very slightly to the right. The frog should sit snugly on the stick, and the screw mechanism should work easily when tightening and releasing the hair. The bow should feel comfortable in your hand.

Get your bow re-haired regularly.
Bow hair does wear out, sometimes in a matter of weeks for busy cellists. Good, fresh hair with an even coating of rosin will completely transform the sound of your cello.

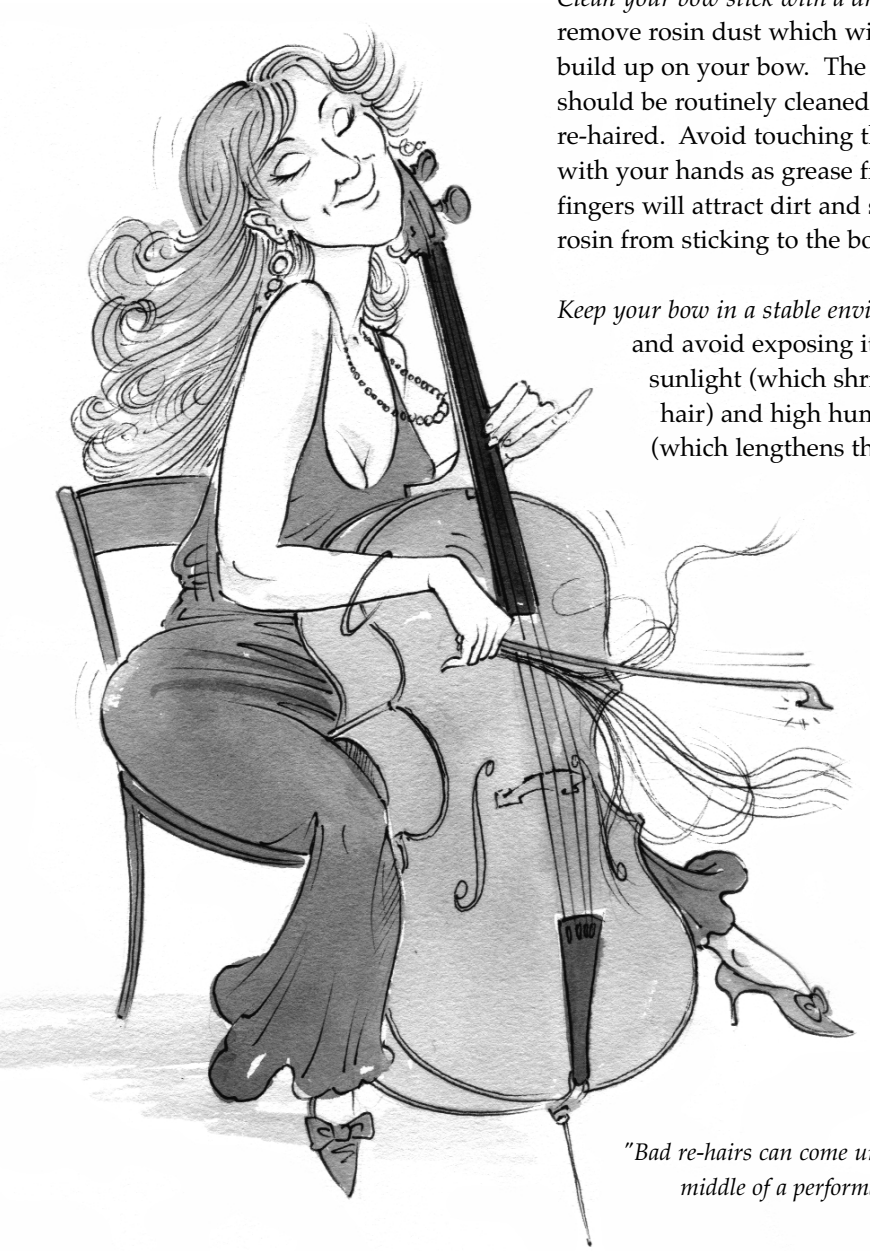
A good re-hairer will take time to select each and every hair for your bow, making sure it is clean, straight and perfect. The hank of selected hairs is then bound together and held into each end of the bow with wedges to form an even ribbon of hair. This is a very skilled job so a good re-hair is not particularly cheap, but the results are worth it. Bad re-hairs can damage your bow or come undone in the middle of a performance.

Allow time for your re-hair to play in.
Fresh bow hair won't hold rosin properly at first and can sound very rough. Apply a balanced loading of rosin and prepare to spend an hour playing it in, though fifteen minutes of aggressive open string chords is usually enough to clear the worst of the roughness from a new re-hair.

Make sure your bow is comfortable to hold.
Many cellists prefer a short re-hair which leaves the hair only just slack when the adjuster is fully unwound. A short re-hair ensures that the frog stays close to the thumb grip when the bow is tightened and also means that the balance point of the stick stays close to the player's hand, avoiding the bow feeling tip-heavy when playing.

Another advantage of a short re-hair is that it allows for the tendency of hair on a cello bow to stretch in use.

Some cellists get a leather flap fitted to the thumb grip to protect their thumb from the sharp edge of the frog. Others thread a pierced rubber thimble or section of rubber tubing over the stick to increase the size and comfort of the stick and to cushion the thumb. All such techniques prevent damage to the bow stick from the thumb nail.



Clean your bow stick with a dry duster to remove rosin dust which will otherwise build up on your bow. The bow should be routinely cleaned when it is re-haired. Avoid touching the bow hair with your hands as grease from your fingers will attract dirt and stop the rosin from sticking to the bow hair.

Keep your bow in a stable environment and avoid exposing it to direct sunlight (which shrinks the hair) and high humidity (which lengthens the hair).

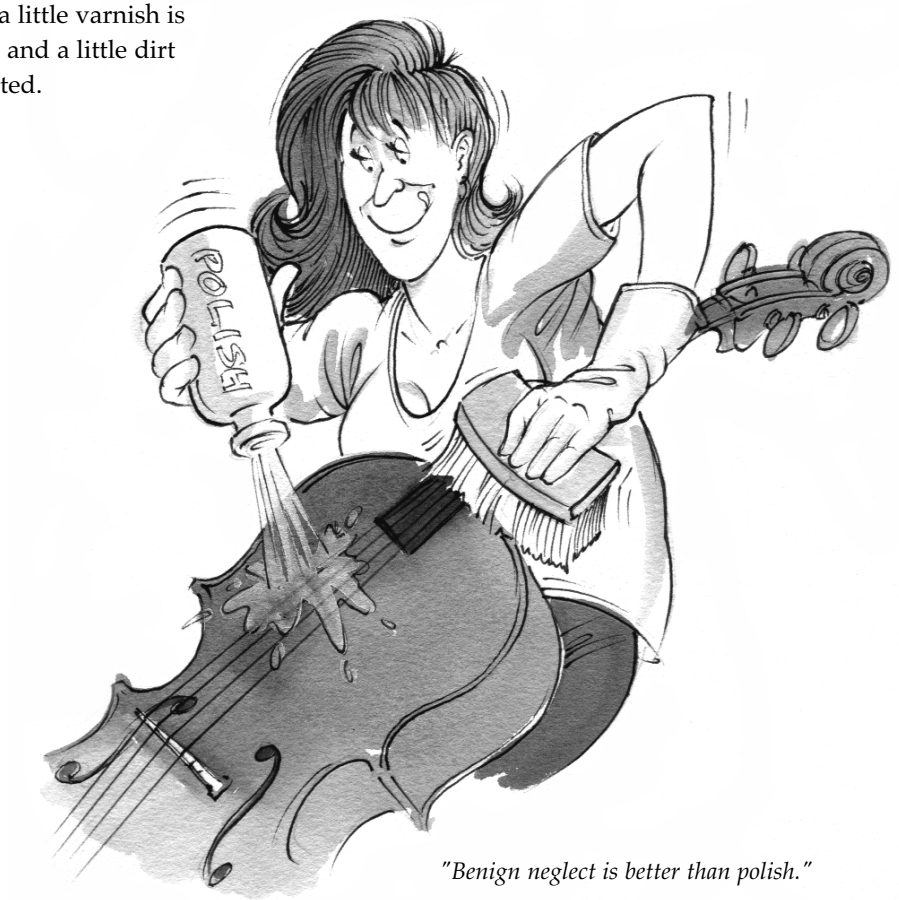
"Bad re-hairs can come undone in the middle of a performance."

VARNISH

Varnish is like the living skin of an instrument and is an integral part of its structure and identity. Not only does it look beautiful, but it protects the wood from moisture, abrasion and dirt and so needs to be treated with care and respect.

Handle your cello by the neck wherever possible to avoid touching the varnish. Every time you touch your varnish, a little varnish is removed and a little dirt is deposited.

Get your varnish re-touched if it is wearing through. Certain areas of the cello are subjected to heavy wear, particularly the shoulder on the treble side and the edgework on the cello front where the cello rests on the floor. If your varnish is wearing thin in these places it is important to have it re-touched before the unprotected areas of wood are damaged or begin to wear away.

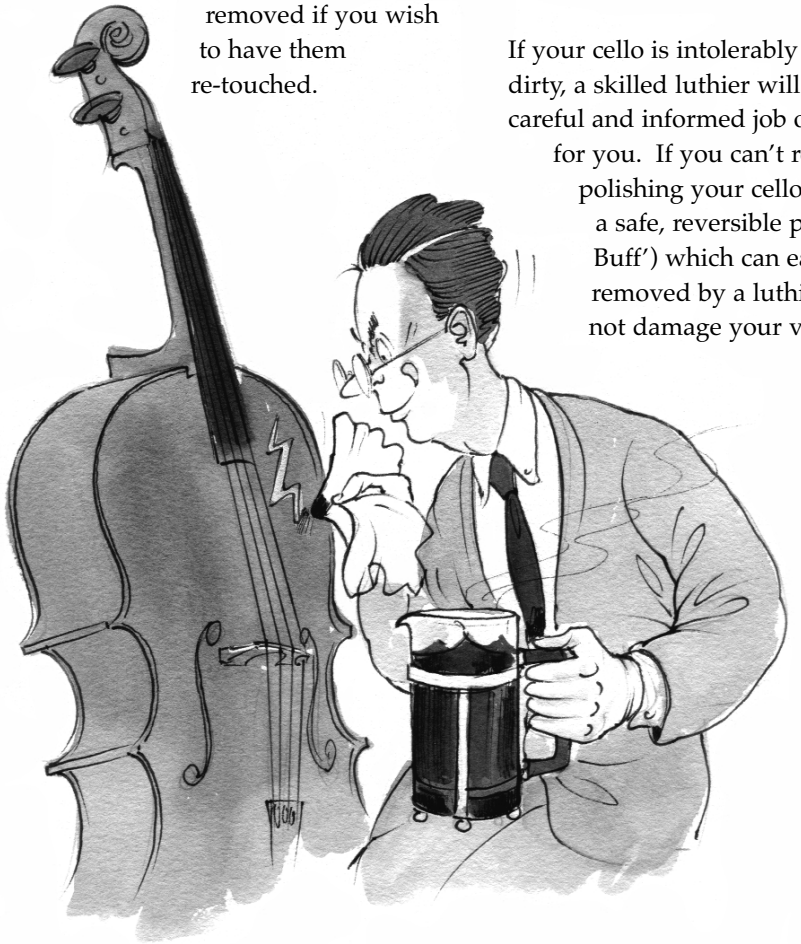


"Benign neglect is better than polish."

Don't worry about small scratches. Don't be tempted to try to camouflage scratches yourself as this may compromise subsequent re-touching by a luthier. Small scratches will gradually become obscured by dirt which can easily be removed if you wish to have them re-touched.

Benign neglect is better than polish. It is best to clean varnish with a soft dry duster and avoid using commercial polishes, most of which either remove original varnish or leave a permanent residue on the instrument which will build up over the years.

If your cello is intolerably sticky or dirty, a skilled luthier will make a careful and informed job of cleaning it for you. If you can't resist polishing your cello, we produce a safe, reversible polish ('Cello Buff') which can easily be removed by a luthier and will not damage your varnish.



"D.I.Y. re-touching may compromise subsequent work by a luthier."

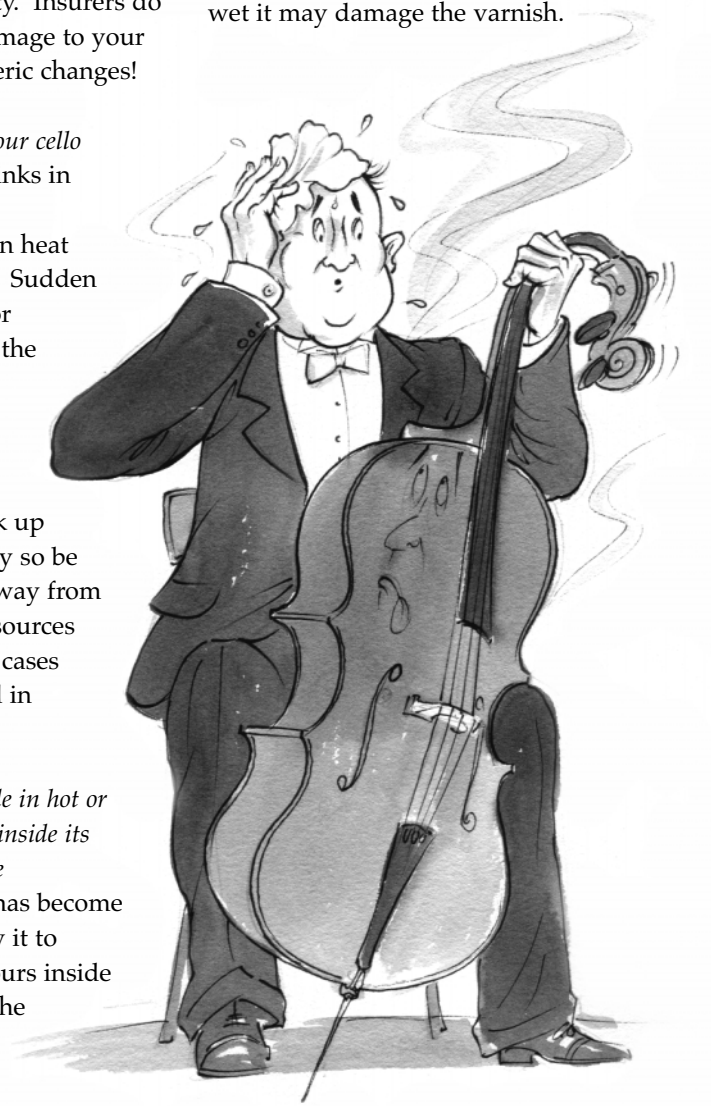
TEMPERATURE AND HUMIDITY

Ideally, store your cello inside its case in a room which stays at a moderate temperature and humidity. Insurers do not cover you against damage to your cello caused by atmospheric changes!

If you are too hot or cold, your cello probably is too. Wood shrinks in the cold and in dry air conditions and expands in heat and moist air conditions. Sudden changes in temperature or humidity will encourage the wood to crack and glued seams may open up as the wood expands or contracts. Dark varnish and black cello cases soak up radiated heat very quickly so be sure to keep your cello away from direct sunlight and heat sources such as radiators. White cases keep their occupants cool in hot weather.

If you take your cello outside in hot or cold weather, keep it closed inside its case until you reach a stable environment. If the cello has become very cold in transit, allow it to acclimatise for several hours inside its case when you reach the next warm environment.

In dry conditions, use a humidifier (such as a Dampit) while the cello is in its case. Wet the humidifier, wring it out and dry the outside surfaces carefully before inserting it into the f hole; if it is wet it may damage the varnish.



"If you are too hot or cold, your cello probably is too."

CELLO CASES

The ideal cello case has a strong outer shell and internal padding which fits the cello snugly and will cushion and restrain the cello if the case is bumped, falls over or is pulled along on wheels.

The restraining strap should fit as low as possible around the neck. The head and neck should be protected from whiplash injuries by the equivalent of a car head rest fitted behind the scroll. The cello should also be protected from loose bows with a specially designed cover or piece of silk.

When travelling in a car, use a seat belt for your cello. If possible, strap your cello into a passenger seat, if necessary turning it upside down if it will not fit into the foot space right side up. Your cello, like any passenger, is far more likely to survive a crash unharmed if it is restrained by a seat belt and cannot fly around inside the vehicle.

Always lie your case down. Cello cases are unstable when left standing and cello necks can easily get broken inside closed cases which fall over.

"If possible, strap your cello into a passenger seat."

INSURANCE

The best solution is to find a specialist musical instrument insurer such as Allianz Cornhill. Not only do they offer good value, but if you ever have to make a claim they are likely to be far more helpful than a normal household insurer as they understand the needs of the musician and the technicalities of instrument damage and repair.

A generous valuation will ensure that it is relatively easy to find a replacement if your cello is stolen or destroyed. It also means that if your instrument is damaged and suffers a loss in value as a result, you will be compensated appropriately. It is worth updating your valuation every two or three years.

Always ensure that your valuation is up to date and insures your instrument, bow and case for a generous replacement value.

"Your insurers will ask you to describe the exact circumstances of the damage or loss…"

MAKING AN INSURANCE CLAIM

If your cello or bow has been damaged or stolen, the first step is to telephone your insurers. They will ask you to describe the exact circumstances of the damage or loss so that they can establish whether you are covered by your policy.

Damage caused by normal wear and tear or atmospheric conditions (e.g. the heat of stage lighting or exposure to cold) is not covered by standard specialist policies.

You may also not be covered if the cello was stolen from an unattended motor vehicle. Insurance policies should protect you against one-off accidents such as accidentally dropping or knocking a cello or bow.

If the insurer is happy that your policy covers your circumstances, they will send you a claim form which you will need to complete and return along with a quotation from a luthier for the cost of the repair or, in extreme cases, advising that the instrument would be uneconomic to repair and should be replaced under the policy. If an instrument is 'written off' it becomes the property of the insurers and they will usually collect it from you.

ANNUAL CELLO CARE

- Fit fresh strings at least once a year.
- Have your bow re-haired at least once a year.
- Take your cello for an annual minor service, in the same way that motorists have their engine oil changed. Your luthier should check to see if any seams are unglued or any cracks are open, and check every aspect of the instrument's set up to ensure that it is working at its best.
- For well used instruments an annual check-up is also a good opportunity for fingerboard truing, varnish cleaning and minor re-touching.

A-Z OF CELLO CURES

BOW HAIR IS DIRTY

It is better to have a re-hair than to try to wash dirty bow hair. Water can travel along the hair and loosen the wedges at the tip or frog.

BOW HAS BECOME WARPED ALONG ITS LENGTH

- This may have been caused by a bad (unevenly tensioned) re-hair
- You may have lost a lot of hair from the playing edge of your bow
- The wood may have responded to atmospheric/temperature changes. Correcting the shape of a bow is a job for a highly skilled bow maker

BOW WILL NOT PLAY WITH 'ATTACK' AND WILL NOT HOLD ROSIN

You may need a re-hair.

BOW WILL NOT TIGHTEN

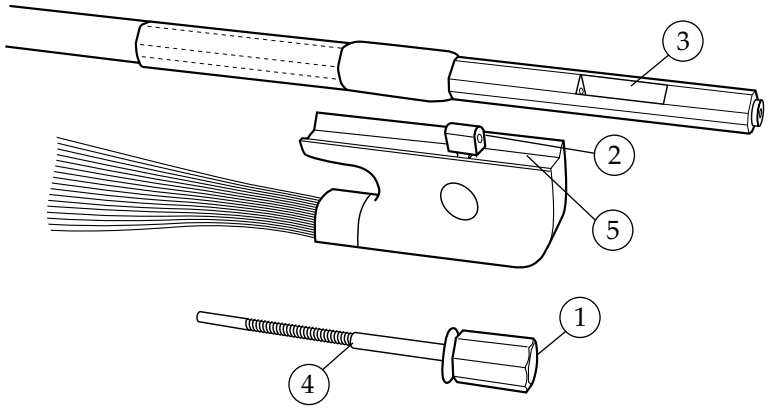
- The brass eye may be worn and need replacing
- If the bow hair is too long the frog will reach the end of the mortice before the hair is tight - usually a re-hair is needed

BOW HAS A VERY STIFF ADJUSTER

The brass eye may be holding the frog too tightly onto the stick. To loosen the brass eye, take the bow apart. If you have never done this before, undo the adjuster completely and, supporting the frog with your left hand, pull the adjuster and screw right out of the stick. Taking care not to twist the bow hair, rest the stick on a flat surface while you look at the frog. (See diagram on opposite page).

The safest way to adjust the brass eye is to use a small pair of pliers. Do not use the adjuster screw to turn the brass eye as there is a high chance of damaging the under-slide of the frog with the screw thread.

To loosen the frog against the stick, gently turn the brass eye anti-clockwise through exactly 180 degrees. Then replace the frog onto the stick and carefully wind the adjuster back into the stick.



1. ***Adjuster/Button:*** the decorative winder fitted to the end of the stick which is attached to the screw.

2. ***Brass eye:*** the brass eye screws down into the frog and the screw travels through its threaded eye, pulling the frog towards the button when tightened.

3. ***Mortice:*** a channel cut into the bow stick which allows room for the brass eye to travel along the adjuster screw when the bow is tightened or loosened.

4. ***Screw:*** a partly threaded steel shaft which is attached to the button and engages with the brass eye to tighten and loosen the frog.

5. ***Under-slide:*** the metal lining of the frog which slides along the stick when the bow is tightened or loosened.

BRIDGE IS WARPING

Ask your luthier to straighten your bridge and try to keep your bridge standing upright in future! If the bridge continues to warp you will need to ask your luthier to cut a new bridge.

"Buzzes can be caused by almost any part of the cello."

BUZZING

Apart from external causes of buzzing, such as a button on your clothes vibrating against the cello or even something in the room vibrating in sympathy as you play, buzzes can be caused by almost any part of the cello. Below is a list of the most common buzzes and possible causes.

BUZZING ONLY ON ONE STRING

- There may be a loose string winding – if so replace the string
- A stopped string may buzz because of an oversized string groove at the bridge; an open string buzz that disappears when the string is stopped suggests an oversized string groove at the nut

BUZZING ONLY ON CERTAIN NOTES

Your fingerboard may be uneven and the strings may catch on the bumps when you stop certain notes. If so, ask a luthier to smooth ('true' or 're-shoot') the fingerboard for you.

INTERMITTENT BUZZING

Buzzes caused by loose purfling or open seams can disappear in damp weather and reappear in dryer weather as the glue softens and hardens. If in doubt, consult a luthier.

OTHER COMMON CAUSES OF BUZZING

- The end of the tail-gut is buzzing against the tailpiece
- Fingerboard is coming unglued
- Loose adjuster – try tightening it down
- Loose bridge vellums
- Loose end pin (spike)
- Loose end of a string buzzing inside the peg box
- Loose decorations on pegs
- Loose plastic sleeve bridge protector; either remove it or push it firmly down over the silk at the bottom of the string
- Open (unglued or fresh) cracks
- Poor contact between the bridge feet and cello front
- Tail-gut vibrating in an over-sized hole in the tailpiece

CRACKS

Do not be tempted to touch a crack with your fingers as this may leave grease behind or damage the broken edge of the varnish and make the crack more difficult to repair. Take the instrument straight to a luthier as cracks often get worse with time. If the crack is near the bridge or sound post on the front or back, you should loosen the strings immediately to relieve tension on the crack.

Always collect all pieces of loose/broken wood when an instrument is damaged. This will help to achieve the best repair and will dramatically reduce the repair cost.

INTONATION PROBLEMS IN CERTAIN PLACES

Your fingerboard may be so worn into such deep ridges that the 'bumps' stop the string, not your fingers.

POWER LOSS – THE CELLO HAS NOTICEABLY LESS POWER

- Seam open somewhere on the cello
- Bridge may be leaning over or have moved out of place
- Strings may be worn out and need replacing
- Your bow may need re-hairing
- The sound post may have moved

PEGS SLIP

Try applying a mixture of peg paste and chalk or plasticine.
Otherwise, consult a luthier.

PEGS SLIP ONLY IN CERTAIN POSITIONS

The pegs are oval in section and only hold in some places. Getting an existing set of pegs to work well is surprisingly time consuming and sometimes it is more appropriate to fit a new set of well seasoned pegs than to re-shape existing pegs. If the peg holes are very worn, they may need bushing.

SOAP

For an excellent string groove lubricant, cut a bar of plain soap into small slices and leave them in a warm place to dry out thoroughly before using.

STOPPED FIFTHS ARE OUT OF TUNE ACROSS THE STRINGS

Your fingerboard may be worn and need smoothing and reshaping or you may have a combination of strings with varying elasticity which make it difficult to play stopped fifths in tune.

STRINGS ARE UNCOMFORTABLY HIGH IN CERTAIN POSITIONS

The string heights at nut or bridge may be incorrect or your fingerboard may be badly shaped.

STRINGS ARE UNCOMFORTABLE IN FIRST/HALF POSITION

Your nut may be too high.

STRINGS BREAK QUICKLY

- The string grooves at the nut or bridge may be too tight, deep or uneven and pinch the string as it tries to travel through the groove
- Your fingerboard may be rough, causing the strings to wear quickly

STRING HEIGHTS HAVE SUDDENLY INCREASED

This can be a result of extreme atmospheric changes. In England it is more likely that your fingerboard has become partly unglued, allowing the neck to warp – or some other important part of the instrument's structure may be on the move. See your luthier.

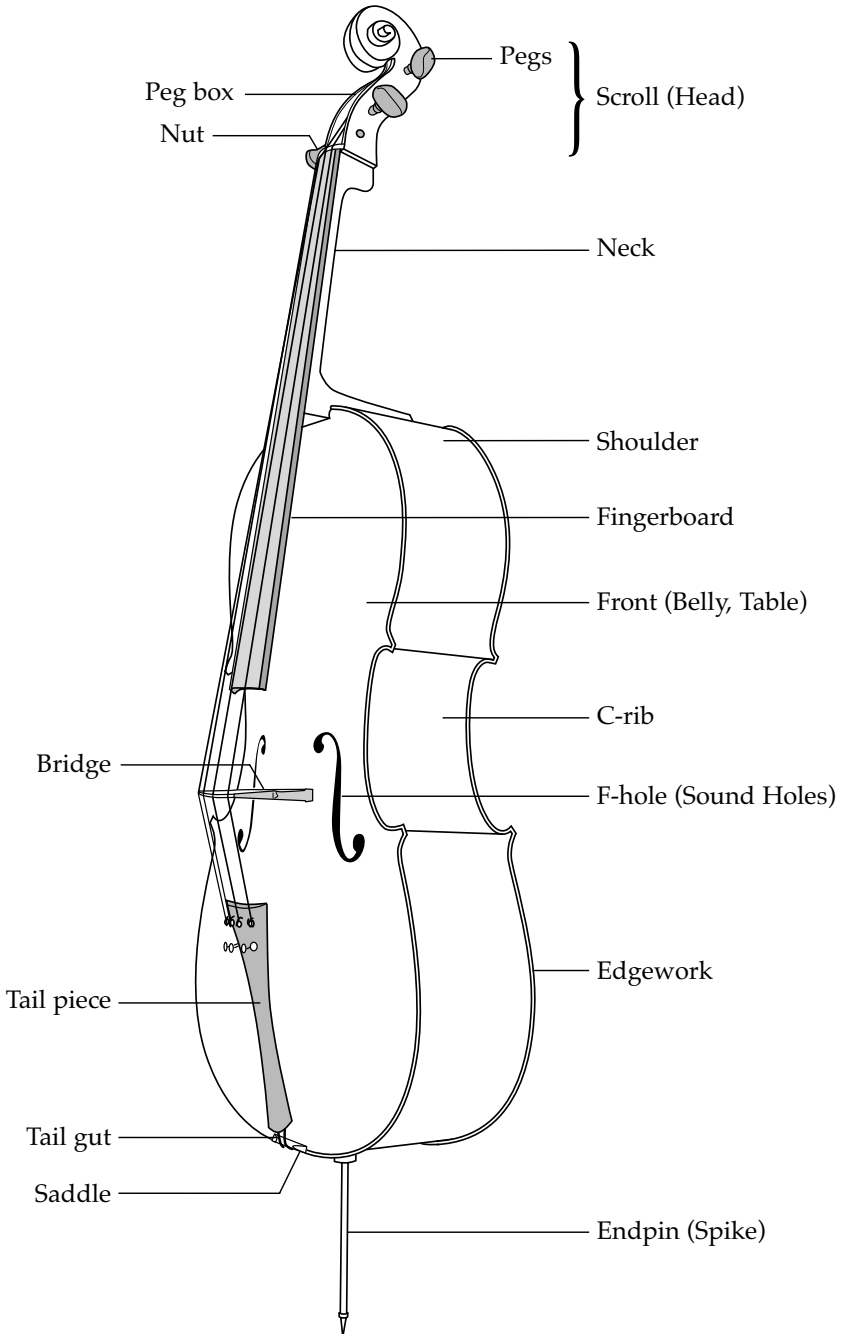
STRING HEIGHTS HAVE SUDDENLY DECREASED

The front of the cello may have responded to atmospheric change.

WOLF NOTES ARE A PERSISTENT PROBLEM

A luthier can help you to experiment with the position of your tailpiece or change it completely. A variety of wolf note eliminators can be tried, all with different side-effects. Lower tension strings can also help if the player is happy to use them.

CELLO ANATOMY



CELLO CARE GUIDE

For further free copies of the Cello Care Guide
email: **sarah@aitchisoncellos.com**
or
telephone **01353 668559**.

A more detailed version of the Cello Care Guide is available at
www.aitchisoncellos.com

We would be grateful for any feedback, questions or suggestions which we will use to improve subsequent editions of this guide.

NEWS FOR CELLISTS

If you would like to receive ***News for Cellists*** our biennial newsletter (containing string reviews, cello articles, details of cellos and bows in stock and invitations to events such as ***Take a Bow 2005***, an exhibition of cello bows by international master makers) please email or telephone us with your name and mailing address.

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