A Riddle of the Sand

Boxmaker **Andrew Crawford** wonders why anyone should be embarrassed about using abrasives for jointing

Veneer bookmatching on this walnut and ripple sycamore box is done with abrasives

Reduced to its most basic, writing a novel simply combines the 26 letters of the alphabet in a certain order. Composing a symphony uses only the 12 notes of the chromatic scale in certain combinations and rhythms. Similarly distilled, every woodworking endeavour involves, in one way or another, taking a piece of wood and making it smaller. For carving and turning, that's pretty much it! For almost everything else, we build things by combining two or more of these reduced pieces.

There are broadly two ways of making bits of wood smaller: cutting or abrading. These are fundamentally different, but are the only ways available to us for removing material from bits of wood, for making them smaller. Therefore it's very important to understand the difference between them so that we can choose an appropriate method to achieve what we need to do. Cutting separates the material and abrading destroys what you are removing.

Modern woodworkers achieve these operations with hand tools, machines and, shhhhh... abrasives. Hand tools are revered, machines are tolerated as being necessary in today's fast-moving world, but abrasives are often still denigrated.

Destroying the waste

Traditional woodworking makes greater use of cutting, while machining tends to destroy the waste with an abrasive action. In any cutting operation, say with a knife, a chisel or a plane, the blade is forced into the material causing stress, separating a 'child' piece (the waste) from the 'parent'. There is a risk to both parts, indeed the parent may be damaged more than the child if you get the grain direction wrong. Generally speaking, the smaller the piece you are removing, the less likely you are to damage the parent piece.

All modern machining operations – routing, power planing and so on – are strictly speaking abrading operations, despite the fact that sharp edges are being employed to remove the material. Sawing, whether by hand or by machine, is effectively an abrasive action, despite 'cutting' one piece into two, because the because the material removed is destroyed.

Mechanising a planing action speeds up the movement of the cutting edge to such an extent that the material being removed is destroyed in much the same way. This is certainly the case with routers and power planers. There is still stress to the parent piece, but with sufficient speed and a sharp cutter this can be reduced to a minimum and bring the operation nearer to abrading than cutting.

There are many paths to achieving excellent results in woodwork, but the love of using edge tools to make high quality work is certainly ingrained in our consciousness. We are all subject to the smell of sawdust, the feel of rosewood and bronze in the hand, and the quiet, slow, physical effort involved in producing something of merit. We've all been indoctrinated into thinking that the traditional approach is the 'right' approach - the only true route to quality work. And for those who can master their hand tools a very real satisfaction is certainly derived from this way of working. The production of shavings a few thousandths of an inch thick is a joy indeed!

Beware romanticism

There is a downside to this romanticism, this misty-eyed view of woodwork. It's important to remember that planes come from a slower age when the progression towards competency was a steady, graceful passage with plenty of guidance from your elders and betters, living and breathing the tools of your future trade in between making tea and sweeping the floor.

Today, many who come to woodworking do so as a hobby, without any prior knowledge or experience, but nevertheless expecting to hit the ground running! So the obvious first step is to buy a copy of *British Woodworking*, scan the adverts and splash out on some expensive handtools.

Having spent several hundred quid on your Holtey, Lie-Nielsen, Veritas and Clifton planes, and other desirable items, you have to work out how to use them. Although planes and chisels seem simple they are actually complex tools. Despite all that is written in the pages of this and other woodwork mags promoting the cause of 'traditional' woodworking, getting the best out of your plane, sharpening and so on, it is still a steep learning curve to become conversant with your new tools and getting them working to their full potential. For some, at any rate, the result can be frustration and disillusionment - after a few fruitless and frustrating outings the planes

Not finishing

While the development of abrasives over the last 25 years has made quality finishing easier, it is the use of abrasives for forming joints and for dimensioning parts that Andrew Crawford considers to have made the largest impact on woodworking. With better adhesives, abrasives can now be used on discs, drums and belts to produce accurate edges and surfaces for joining.

Prototype **Andrew's first disc sander was nothing more than a chipboard disc mounted on a lathe chuck, with a table bolted to the lathe bed**

go back in their boxes. So, the belief that the traditional route is the 'correct' route, the feeling that you should be doing this or that job using a smoothing plane/shoulder plane or whatever, can be a real impediment to achieving what you want to achieve.

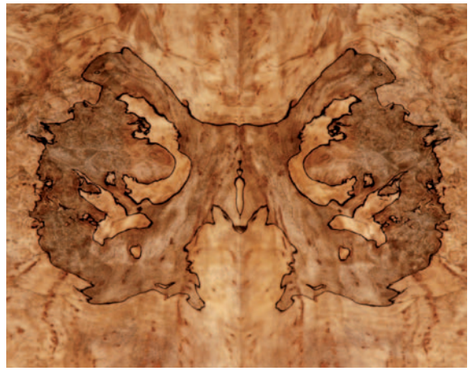
Realistic woodwork

In the real world, most woodworkers use an intelligent blend of ancient and modern, hand and machine processes. I have in the past felt a certain pressure to make greater use of edge tools, partly self-imposed, and considered it to be a bit of a gap in my methods. Avoiding as I do most traditional cabinetwork, I don't own ranks of beautifully made, expensive and perfectly-tuned planes, nor a cabinet full of immaculately sharp chisels for all purposes. I do use a few planes and chisels which I keep reasonably sharp on a need-to basis, but as I concentrate very much on the veneer and decorative work, I now stick to what's appropriate for what I need to achieve. Consequently I use abrasives for many key processes.

When teaching I often meet woodworkers looking to increase their hand skills, assuming that that is how I achieve my results. I've taught many such woodworkers for whom the use of hand tools in general, and planes in particular, has been a significant stumbling-block, and for whom the introduction of abrasives for small work has been a revelation, representing a breaking away from the tyranny of tradition. A quick demonstration of perfect bookmatching using a ludicrously simple abrasive-based jig, or achieving perfect mitres on small cross-section stuff using a disc sander, goes a long way to a conversion in favour of using abrasives.

A plane, even finely set, needs considerable force to remove a shaving from an edge or face. Even with the workpiece held on a shooting board, the relative size of the shaving is sufficiently large to risk damage to the parent in one way or another. In comparison abrading removes much smaller pieces of waste, and hence an abrasive action is safer, especially the smaller the task. Jobs like reducing a component to exact length, removing a hair's breadth from the edge of a line to be inlaid and smoothing the inside edges of a box lid cut off on the bandsaw can all be achieved more easily with abrasives than edge tools. And paradoxically, an abrasive covered board offers the perfect solution to holding a slim piece of stuff that needs to be planed!

Don't get me wrong, I'm not arguing against the use of hand tools. There will always be a place for high quality planes, chisels and saws. But feeling that that is the only path to quality work can be counter-productive. Abrasives should be welcomed into your toolbox as an equal partner, not a below-stairs embarrassment only to be resorted to when all else fails.

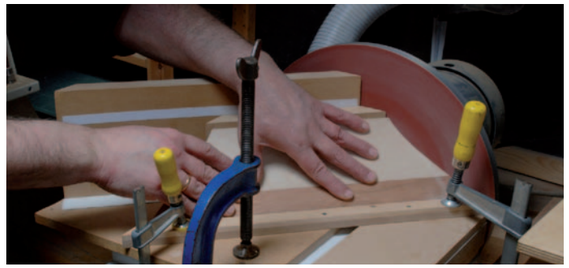


Abrasion **Perfect bookmatching achieved with abrasives (above) by sandwiching the veneer between two pieces of MDF, and (right) a selection of sanding machines in Andrew's workshop**

Abrasives of the past

Really good abrasives are a recent development compared with hand tools, and therefore don't share the same heritage. And of course they don't have the mystique nor the risk and skill associated with quality planes and chisels and saws. Neither do they involve objects of desire lovingly crafted from hornbeam and brass!

Many of today's woodworkers grew up at a time when abrasives were not considered a worthy alternative to 'proper' tools. Those of us who remember glass and sand paper [fine, medium and coarse!] know that this was truly dreadful stuff. Material was removed slowly, leaving a scratched and scarred surface, and it clogged and wore out almost immediately. Even the very finest 'flour' grade paper did very little but still left scratches which then had to be removed with a well-sharpened cabinet scraper or smoothing plane. So, this led to an entirely understandable and justifiable prejudice against abrasives. But although things have moved on hugely over the last 25 years or so, the prejudice lingers on! Quality, usable abrasives have only been around for, say, 25 years and really good ones for about the last decade, so they should no longer be treated with disdain, nor as unworthy of real craftsmen and craftswomen.



Mitres **Using a solid-faced sanding disc (not with Velcro) to trim mitres on the corners of a curved form lid (left). This is almost impossible to achieve with an edge tool**

Progress

If you were to draw a graph defining the the development of woodworking techniques (Fig.x), the green line would go way back into history, and development to the hand tools it denotes has been steady and minimal through the centuries. A rough guess is that the beginning of the red abrasives line is around 1950, start its steep ascent, hand-in-hand with advances in adhesives technology, around 1980, so certainly within most current woodworkers' lifetimes. The path is not dissimilar to computers, from nothing to stellar in a couple of generations.

There was a time when some considered that the wonderful Ian Norbury was not a 'proper' woodcarver because he makes use of files, burrs and abrasives. What's more (heaven help us!), he incorporates other materials into his work. But everyone needs their own unique set of skills and techniques: mix and match, cherry pick - don't be bogged down by tradition. As the Danish boxmaker, Anne Louise Bang once said in the book *Celebrating Boxes*: 'I love tradition, and I love to challenge tradition.' This is as healthy an attitude to woodwork, and almost anything else for that matter, as it gets!

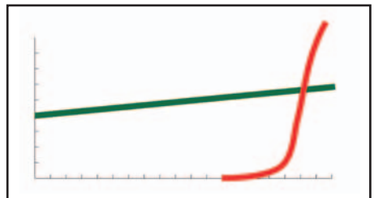


Fig.1 The development of hand tools (green) and abrasives (red)

Abrasives will never replace edge tools. That's not the point of all this. But like good folk music, new instruments, techniques and styles should be embraced. If there is merit each will take its rightful place alongside the traditional after the first flurry of excitement and prejudice has died down. Things move on! Bob Dylan eventually went electric [Judas!] and the synthesiser didn't replace all known acoustic instruments as some feared. Video did not kill the radio star!

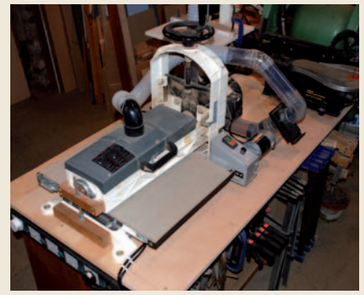
Many who read this and other magazines will be home woodworkers, and therefore not doing their woodwork for commercial reward, but rather for the satisfaction of the process - the journey. If it takes half a day to get a board flat with a beautifully sharpened plane (which in itself took a day to 'prepare') and a pair of winding sticks, good on you! But you have to be clear what your objective is, and avoid slavishly bowing to the tyranny of the traditional because you believe that there is no other way. Hand planing can be a joy, and hugely therapeutic, but don't let the need to produce long, curly shavings get in the way of a desire to make things for your home.

Of course, I will be preaching to some who are already converted, but to others I hope that this goes some way to redressing what I think is a current and significant imbalance in favour of traditional techniques, perhaps as a justification for all the new and expensive planes on sale out there! Maligned for too long, abrasives in their many forms have place. Please don't be ashamed to use them.

***Details** Andrew Crawford runs courses in boxmaking, veneering and inlaying at his workshops in Shropshire. Find out more at fine-boxes.com.*

Sanding kit

What Andrew uses in making



One machine that is beyond some amateur woodworkers' range in Andrew Crawford's workshop is his 16-32 drum sander (above), which costs about £800 from Axminster. This enables him to thickness small components accurately and safely, and does a particularly good job on awkward grain timbers such as ripple sycamore. You can only remove a small amount of material in one pass and good dust extraction is essential. This sort of drum/thicknessing sander should not be used in place of a normal thicknesser.

Andrew also has a bobbin sander (above left) for concave shaping and a stationary belt sander for various flattening, smoothing and convex shaping processes. He uses stationary disc sanders for perfectly rough-cut mitres and loads of other tasks, but he says that the most useful 'jig' is a piece of 1in MDF with 80 grit abrasive on one side and 150 grit on the other (below). "The board is about 24x18in and the abrasive comes from belts for large industrial sanding machines, available from any big abrasives company. I use this simple abrasive board for so many operations, including levelling the inside edges of boxes and lids, minutely reducing the width of inlay lines, general de-burring and myriad other jobs."