TURNING ANTLER

Delbert Dowdy
Wake Village, Texas
903-838-9012
ddowdy@valornet.com
www.genevaconcepts.com

Why Antler:
Many people are attracted to items made of deer and other types of antler. It is a material that one does not expect to be made into pens, key chains, and kaleidoscopes. Hunters and people looking for a unique item are often interested in items made from antler.

Turning Qualities:
Turning antler will be very similar to turning a very hard wood. It drills, turns, sands, and finishes like wood. I have not had a chipping problem with antler. The problem is with the smell, which I will discuss later. Depending on the amount of mineral in the antler, turning tools will dull slightly faster than with most hard woods.

Turning Tools:
I use the same tools that I would use in turning wood. The tools that work best for me are gouges and scrapers. Most of my turning is done with a small roughing gouge and small spindle gouge.

Types and Structure of Antler:
Antler comes in several grades. Some older antler can become chalky and can literally crumble in your hand. Cracks can appear in the antler. Chewing marks, broken antlers, along with chalkiness and cracks can reduce the grade of the antler. Only the chalkiness and cracks should definitely be avoided. Another problem that can occur as you turn the antler is that the porous inner part of the antler can appear at the surface. We can deal with many of the pieces if the porous surface does not cover more than half of the surface. I will discuss this later. Antlers will vary by the type of deer and elk. Just as people's teeth will collect minerals in the water and produce coloration, antler will do the same thing. Some antler is pure white and other is darkly colored. Most people that I have talked with prefer the colored antler. It looks like what they think antler ought to look like.

Acquiring Antler:
Antler will be either obtained from a dead deer or when a living deer sheds his antlers. These are appropriately called sheds. Hunters and taxidermists along with catalogs, ebay, and the internet are good sources of antler.

Uses for Antler:
Although people are finding numerous uses for antler, I am only using it for small turning projects. Three that I have been making are writing pens, key chains, and kaleidoscopes. This allows me to use almost the entire antler from the deer.

Preparing Antler:
When deciding how to use the antler, I try to find pieces that are not chalky or cracked. I would prefer to use pieces that show some of the roughness of the antler when finally turned. People like to see this roughness and say it looks more like antler to them.

Smell of Antler:
One of the downsides of antler is the smell when sawing and sanding it. It has the acrid smell of burning animal tissue. Although not the same, if you like the smell of burning hair, you will like this smell. A lot of ventilation and removing the dust will go a long way to minimizing the smell.

Basic Instructions:
Many of the instructions for making pens, key chains, and kaleidoscopes are the same. Only slight modifications need be made to make key chains after making pens. Kaleidoscopes have some major differences in that there is no tube and the drilling in smaller antler pieces can be a bit more complicated.

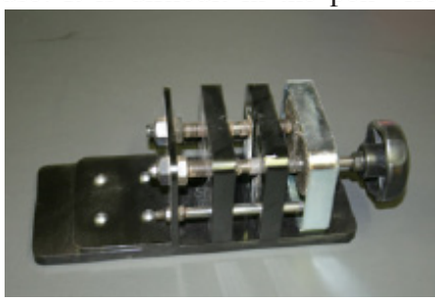
Steps:
The steps to making these projects include: cutting to approximate length, drilling, gluing tubes, shortening to final length, turning on the lathe, sanding, filling any porous portions, finishing, and assembly.

Cutting to approximate length:
The initial cutting of the piece from an antler rack requires a bit of thinking to minimize the waste and selecting the best antler for the project. The job of selection is often more difficult because the antler is curved and you must drill a straight hole. This means that the diameter of the antler must be larger than if it were straight, to prevent drilling

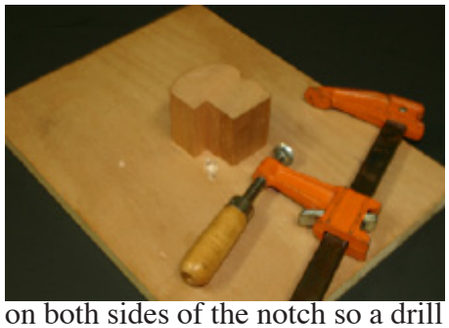
out the side of the curve. If you choose a piece much larger than the finished size, you may lose all the outside features and get into the porous material at the center of the antler. I hold a piece of the tubing up to the antler and move it around to find a piece that should work. When turning the antler, the inside of the curve is usually left unturned which shows the original outside surface. After choosing the section, I mark it with a dark marker leaving from 1/8 in. to in. extra at each end. Either bandsaw or use a handsaw to cut the antler perpendicular to the axis of the tube. Do not try to cut on a tablesaw or mitersaw.

Drilling the Antler:

After you have chosen and cut a piece of antler to make into a pen top, you need to drill the hole to receive the 7mm brass tube. You will need a 7mm drill bit ($4) mounted in a hand drill or preferably a drill press. A drill press will make drilling a straight hole easier. How does one hold the round and curved antler piece. I have tried the pen drilling vise but have ruined about as many blanks as ones that I could use. It is difficult in the pen vise



to see how the piece is lined up. I made my first drill jig and have great luck with it. It consists of a inch piece of plywood with a block of wood screwed to it with a square notch cut out of one corner. By placing the antler in the notch, I can see if it lines up straight for drilling. I look to see that it aligns



on both sides of the notch so a drill bit will not go out the side or bottom of the antler. Some pieces will just not fit well in the notch and so have to have the corners knocked

off. I very carefully hold the piece on the end with my thumb and first finder and place on a belt sander. Belt sanders can remove skin very quickly. I will form as many flat surfaces as I can on up to four sides. This should help the piece

to fit in the notch. Hold the antler with a clamp. As you drill, go

slowly and remove the bit often to clear the antler that tends to clog the drill bit. After completing the drilling, remove the piece and carefully check to see that the drill bit did not blow out the side or bottom. You are now ready to glue the tube.

Inserting the brass tube:

Take the brass tube and sand it with medium grit sandpaper not finer than 150 grit. Glues tend to make a mechanical bond with the scratches rather than a chemical bond with the brass. I like to use polyurethane glue for the tubes. Polyurethane has some negative and positive qualities. It dries slowly so you will have to wait several hours to use it. It is really messy and you should use gloves. I like the cheap foodservice gloves that you can by in boxes of 500 at Sams. The glue can dry in the tube if you are not careful. I turn the tube upside down in a container and kept the glue usable for over a year. It is the good qualities of the glue that make it my choice for these projects. The glue expands unlike any other glue. That means you will fill up a space if you have used an oversize drill bit and it will try to expand into the porous material at the center of most antler. Sanding and other operations can cause a lot of heat and some glues will soften and turn loose. Polyurethane has the highest heat tolerance. After the glue dries you may have to clear the glue out of the tube. The glue is soft and is easy to clear away.

Sizing the antler to the tube:

The antler is longer than the tube at this point and must be shortened to match the length of the tube with the ends of the angler perpendicular to the tube. You could use a barrel trimmer at this point. A set with different size shafts to fit inside the different size tubes can easily

cost $30. I have developed a way to trim the antler quickly for different size tubes. My way requires that you have a disk sander with a miter slot and miter gauge to ride

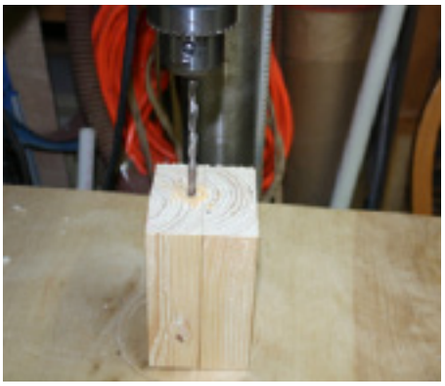
in the slot. The miter gauge must be at a 90 angle to the sanding disk. This is easy to check with a plastic 'square'. I make blocks of wood that can ride against the mi-

ter gauge. The blocks can easily be made of 2x4 lumber. I glue two piece of 2x4 lumber together. One side of the now 4x4 block must be

straightened either on a jointer or a table saw. With one side straight, you can make the other side parallel with a the table saw. Now cut the ends off the block so that the ends are perpendicular to the sides of the block. I purchased a Pittsburg

28 piece set of Transfer Punches

at Harbor Freight for about $15. Find a punch that just fits snuggly inside the pen tube. Find a drill bit slightly smaller than the punch or the same size as the punch. Turn the 4x4 block up on end on a drill



press and drill a hole deep enough so that when you pound the punch in the block, what is sticking out is shorter than the brass tube. If the rod is loose, you may have to add glue. I have reduced aluminum and iron rods down to fit the brass tube but the transfer punches are easier. Place the block on the disk sander with one side firmly against the miter gauge insuring the punch and brass tube are perpendicular to the sanding disk. Place the antler on the punch and slowly sand the antler checking often to see if the brass tube is showing on the sanded edge. Stop when you see the sanded brass tube. Reverse the piece and sand the other end. What little you lose in length of the tube

will not matter. You are not ready to turn the antler down to size.

Turning the antler:

You will need a pen mandrel and two bushings. Use a 7mm bushing on one end and a bushing to fit the diameter of bottom of the pen. If you are using something larger than 7mm such as a shell casing, you will need to find a bushing close to its size. You might find a

bushing for some other project that is the correct size. I have also made bushing by take an aluminum or cold rolled steel bar and drilled a hole to fit the mandrel shaft. I then turned the metal down to final size using high speed wood turning tools. High speed steel is what a machinist would use to turn aluminum or soft cold roll steel. The

cut off tool is very useful for this.

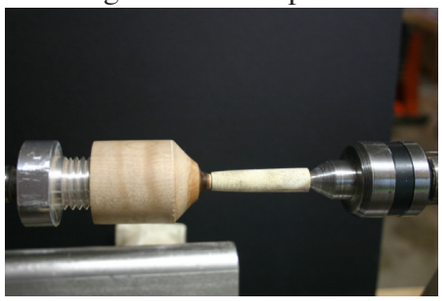
I slowly rock the tool left and right and take off metal until I have a bushing. The tools that I have the best results in turning antler are roughing gouges and spindle gouges. I do not get good results using a skew or scraper. Slowly turn the antler down to final size to match the bushing size on the ends and a

smooth taper in between. I now remove the antler from the mandrel before I sand and finish it. I do not want to sand down the bushings and get finish on the mandrel.

Sanding the antler:

I want to hold the antler in such a way so I can easily sand and finish it. In the head stock I place a tapered wood piece that will fit inside the tube. I have made three different pieces. One fits on an threaded

aluminum piece that has a #2 taper. Another is tapered with a turned #2 taper on the other side, and a third has a taper and shaft that fits in spigot jaws of my chuck. In the tail stock I have a tapered live center. An inexpensive center would be a good choice. Place the antler piece between centers and sand quickly with 100, 150, and 220 grit. If you feel roughness at this point or can



see porous horn (tiny sponge like holes), you will need to fill the

holes. If the horn is smooth, quickly sand with 320, 400, and 600 if you like.

Filling the porous material:

To fill the porous part of the antler, you will use thin CA glue, paper towels, and 220 sandpaper. I like to use Flextips on my CA glue. They are tips that you place on the

end of the glue bottle and have a long thin tube for administering small amounts of glue just where you want it. You can get the Flextips for CA glue from The Sanding Glove. Protect you eyes and the bed of your lathe before proceeding. I place a small amount of glue on just the porous portion with the lathe off and use a paper towel with the lathe turning to dry it. High speed helps to dry the glue quickly. When the glue is dry, check to see if you have almost filled the holes. For the next step put glue on the piece while not turning. Turn on the lathe and sand the piece with the 220 sandpaper. The sanding dust will help to fill the holes. Repeat until the piece feels smooth all the way around. Now sand with 320 through 600 sandpaper.

Finishing the antler:

How you finish the antler is a matter of choice. I like to put a few coats of thin or medium CA glue for a finish. You could leave it natural, buff it, wax it, or put on a film finish like polyurethane or lacquer. Insert the clip in the small end of the antler and you have a finished top for pen.

Key Chain Knife:

I like to make a key chain knife with the medium size piece of antler. It is a novelty item and useful.

People will be surprised when you take the key chain apart and make a knife out of it. The kit is available only from Craft Supplies for

$8 to $9. You will also need a 31/64 in. drill bit that you can buy from

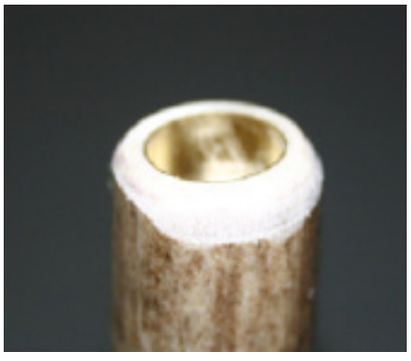
Craft Supplies for $13 or you could buy a cheap set of drill bits in 64 ths and have other useful sizes also. Much of the making of the knife is similar to the pen.

Drilling, Gluing, Sizing:

I use the same drilling block with the same techniques as before. Drill the hole slowly all the way through. Sand and glue the tube with polyurethane glue. After cleaning out the glue go to the sander and use a sizing block made for this 31/64 in. tube.

Turning, Sanding, Finishing:

Place the antler between key chain knife bushings ($4) on the mandrel. Turn the antler like the pen with the same tools. I keep the piece fairly straight and round over the ends where the caps will fit. Remove the



piece from the mandrel and place it between the wooden drive taper and the live center. Sand the piece and fill any porous material. Finish as before.

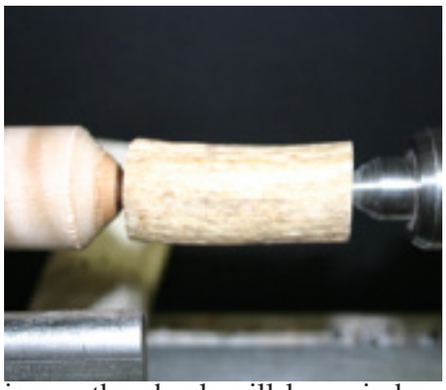
Kaleidoscopes:

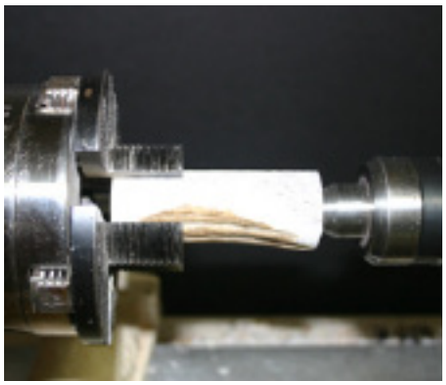
There are some differences in turning a kaleidoscope. A brass tube is not used. If the antler has a small diameter close to one inch, there is a real danger of drilling out the side and ruining the piece. Pieces of sufficient length and diameters over 1.25 inches are not common in deer so special techniques with the smaller pieces must be used to ensure good results. Kaleidoscope kits cost from $10 to $11 each.

Drilling:

If the antler is large enough (1.25 in diameter or more) you could drill the antler like the other projects. I will describe how to drill smaller pieces. I place the antler on the drilling block and drill a 7mm or inch hole all the way through as close to the center axis

of the piece as possible. This hole will be the guide for all the other drilling to come. I take the piece to the lathe and mount it between the wooden taper and live center. Using a roughing gouge, I round the piece enough to easily fit in the spigot jaws of a chuck. Leave some rounding for the final turning as the chuck will leave indentions in the antler that will need to be removed later. Now place one end of the piece in the spigot jaws of a chuck. Use the live center in





the tail stock to center the piece before tightening the jaws. Remove the live center and place a drill chuck in the tail stock. The kaleidoscope has a central tube that will fit loosely and two screw on caps that hold the inside together. I drill a slightly smaller hole for the central tube and larger shallow holes for the screw on caps. Because antler tends to curve, the inside of the curve represents the smallest diameter on the piece usually. The ends of the piece are usually a larger diameter. In the drill chuck I place a in. spade bit. The spade bit cuts easily and does not clog. The hole may be a bit rougher but that is not important. The spade bit can wander off center but the large center cone of the bit fits nicely in the small center hole and should track straight down the hole. Drill all the way through being careful

not to hit the four jaw chuck at the far end. The holes for the screw on caps are made with a 13/16 in. forstner bit ($10). Before you drill the hole, clean up the end and make sure it is square to the lathe. Now drill a hole about inch deep. Re-

move the piece and mark it for final length. Reverse the piece in the four jaw chuck with the drilled end toward the jaw. Center with the live center and tighten the chuck. Turn the end to final length and square up the end. Drill a inch deep hole with the 13/16 forstner bit.

Turning:

Place the piece on the mandrel between two kaleidoscope bushings ($5). Turn to final size and round

off the ends. Be sure to remove and marks left by the four jaw chuck.

Sand, Fill, Finish:

Sand the piece between the wooden taper and live center like the other pieces. Fill and pores and finish as desired. Assemble the kaleidoscope and enjoy looking.

I would be happy to try to answer any questions you may have or to hear about your successes. Contact me anytime.