

# The CNEW Skew

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## Editorial

### What is a Negative Rake Scraper?

The basic design of a Negative Rake Scraper (NRS) is a scraper with an additional bevel on top of the tool where it's normally flat. The blade is ground on the top at an angle and then the lower bevel is ground to produce a burr on the upward edge – it is only the burr that does the work. There is no need for the upper and lower bevels to be symmetrical so the upper bevel is usually much longer: that way only the lower bevel has to be reground to create a new burr. In fact, any tool ground this way can be used as a NRS – a freshly ground skew held flat works just as well, as long as you use it with the burr facing up!

The great advantage of the NRS over a standard scraper is that it is almost impossible to get a catch, even on hard end grain. The question is why the change in geometry is so effective in eliminating catches. Andrew Hilton ([www.hiltonhandcraft.com/woodturningarticles.asp](http://www.hiltonhandcraft.com/woodturningarticles.asp)) thinks it's because you can actually ride on the lower bevel. My own opinion is it's mostly because the burr extends out in front of the edge instead of curling back over it as in a regular scraper. That, and possibly the fact that a NRS is much thinner at the cutting edge than a regular scraper, means that when a catch does start there is very little metal being “bent out of shape”. So when the wood gives way, there is much less energy stored in the deformed metal.

The NRS is an excellent way to refine shape and take out small tool marks – it is very easy to use and a great way to get accurate shapes or thickness. It is not aggressive even on very dense end grain, unlike a regular scraper with a burr. However, it is not a bulk removal technique as the cutting life is very short. It is essential that there is a burr present on the cutting edge – once the burr has been worn off, the scraper will not work well and will usually start tearing the grain.

You can tell with experience when this tool is getting dull, as you will need to add more and more pressure to keep the tool cutting. At this stage if you do not re-sharpen you will be tearing the grain and it will take several re-cuts and re-sharpenings to repair the damage. So sharpen early, sharpen often.

### The History of the NRS

The most prominent use for a NRS in the past was for making musical instruments from hard woods with dense grain, particularly ivory and blackwood.

Ivory has a grain like a dense exotic and will grab on any type of scraper that does not have a negative angle. However, because of its extreme density and very high specific gravity (some 50% greater than any wood known to man - SG 1.84) it can be cut without the burr on a scraper with a negative angle. Ivory was used for making Billiard and Snooker balls. These were hand turned and to get extreme accuracy scraping was essential and a negative angle on the scraper was required to avoid the ivory grabbing at the tool.

Blackwood is used for the majority of high quality Bagpipes and one essential part of the bagpipe is the

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## Club Officers and Contact Info for 2007

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chanter. This is the section of the instrument that is actually played to produce the notes. It is approximately 15" long and tapered along it's length – it has a wall thickness of less than 1/8" (3mm) along it's full length. This piece of the instrument is by far the hardest part to make and requires scraping to achieve the required accuracy in wall thickness.

It is almost impossible to scrape Blackwood with a regular scraper blade either with or without the burr. Using a regular blade will cause the wood to grab at the tool and shatter the chanter piece. Instead a negative angle is required for the blade to prevent any grabbing. However, due to the high density of Blackwood, it is not always essential to have a burr and remember that the chanter is all side grain turning, so the negative angle without a burr will peel off the wood fibers. The tool must however be kept very sharp. If it is allowed to dull then the turner will start pushing and cause the thin wall of the chanter to chatter, however, it would not grab but instead just leave a poor quality finish.

**Subject:** Planting season

A true(?) story told by L.A.P.D.

An old Mexican man lived alone in East Los Angeles. He wanted to spade his garden, but it was very hard work. His only son, Jose, who used to help him, was in prison. The old man wrote a letter to his son and described his predicament.

Dear Jose:

I am feeling pretty bad because it looks like I won't be able to plant my garden this year. I'm just too old to be digging up a garden. If you were here, all my troubles would be over. I know you would dig the garden for me.

Tu Padre

A few days later, he received a letter from his son:

Dear Papa:

Por Dios, Papa, don't dig up the garden. That's where I buried all my drugs and money.

Tu hijo,

Jose

At 6 a.m. the next morning, the L.A. Sheriffs showed up and dug up the entire area without finding any drugs or money. They apologized to the old man and left. That same day, the old man received another letter from his son.

Dear Papa:

Go ahead and plant your garden now, papa. It's the best I could do under the circumstances.

Love,

Jose XOXO

## Shop Visit: Ken Dubay

### Dave Eaton

On Feb. 1st, 2007, I and several members of CNEW and CCW had the pleasure of joining Ken Dubay for a full day shop visit at his home in Columbia, Connecticut. There were about a dozen of us all sharing ideas and having a good time.

To start the day, Ken showed how to core a nested set of bowls, use the vacuum chucking method of turning the foot side of a bowl and a few more tricks. After his demo's we all took turns standing at one of Ken's two Oneway 2436 lathes. Everyone got



6pm. It may be a bit of a drive from your house to Ken's but one thing I can guarantee is that you'll be quite pleased you made the effort should you get there one day. Ken is, aside from being a gracious host, quite a gregarious and entertaining fellow with loads of turning skill and talent he is quite willing to share. He teaches classes at all levels and many techniques, beginner to expert.

Ken invited us back anytime to do it all again. I think that it would be great if we could make a pilgrimage every month or two as a group. In the meantime if you wish to visit him just make a phone call and set up a date.

Thanks Ken for such a fun filled day. I can't wait until next year's shop visit, but I'm sure I'll see you well before that – Dave Eaton

a chance to turn something with wood supplied by our gracious host. He even had a selection of woods and burls for a wood swap and Dave Eaton brought a trailer load of freshly cut "Big" Cherry with a few pieces of Mulberry, Black Locust and Elm mixed in. Proceeds from the swap went to the CNEW club treasury.

At lunchtime, as is customary at Ken's, his sweet wife Mary set a wonderful table serving up a hot chicken soup, crackers, rolls and an excellent desert. We devoured that all up and headed back to the well heated shop for more chipping away.

That was the day in a nutshell. Quite a good day! Fun, learning and laughter from 9am until around



## Make a tool holder

Dave Eaton

Many useful woodturning tools are only available in the form of a “bit” or “tip” rather than a fully handled tool. A couple that come to mind are the Wolok or Martel Hook Tools and standard Two Flute End Ball Mills which are used for end grain hollowing of open forms like boxes and vases. Additionally for closed form hollowing square carbide tool tips can be used such as David Ellsworth shows. One reason these are sold in bit form is they are made of extremely hard steel which prohibits them from being long in length.

Since these tool tips are usually not supplied with the supporting “holder” needed to use them for turning, one must either purchase a suitable holder for around \$25 or craft one themselves.

The latter is the subject of this article. You need only rudimentary metal working skills and equipment to take a round steel rod and adapt it for such use. The cost of making such a tool is considerably lower than a purchased product and is nearly identical when complete.

First, let’s start by understanding the problem. The tool bit is typically a piece of metal with a special grind on it which terminates in a short one or two inch straight



shaft for mounting such as the Wolok Hook Tool shown here. If the bit were not held firmly by the rod as shown it would be of little use. Once we have a steel rod holding the small bit we are then able to use the tool just as it is or, as is often done, with the other end of the rod inserted into a wooden tool handle such as would be typical of any other woodturning tool.

Even though the rod is simply a length of steel with a hole drilled into the end it can be a little tricky to fabricate for the ordinary woodworker who lacks access to a metal working shop. Let’s see how we can easily machine one of these rods using tools most woodworkers have access to.

First of course, you need to obtain a suitable length of useful diameter steel rod. Choose either cold rolled, mild, or galvanized steel rod as it is soft enough to ma-

chine easily. This material is readily available at home centers like Home Depot or Lowes, Ace Hardware etc, or can be purchased from MSC Industrial Supply, Grainger, Enco Tools and more.

The diameter of the rod can be critical. It must be large enough to allow a hole in the end big enough to accommodate the bit you will insert and rigid enough to withstand bending or vibration when working at full depth. For hollowing to a depth of less than 18 inches, a 5/8” diameter is recommended. For deeper hollowing move up to 1+ inch diameter. If I recall correctly, Mitch Wolok, who developed a hook tool, said he can hollow perhaps 3 feet deep with a rod larger than 1 inch (and 6 ft long!) but for our discussion let’s stick with 5/8” diameter rod which is probably all we’ll ever need.

Most steel rod at local hardware stores will come in a 3 foot length. This is a bit long for our needs so cut it with a hacksaw to a shorter length. My choice is to cut it right in the middle yielding 2 each 18” lengths for 2 holders. You could choose 12” lengths but after burying 3 inches into a wood handle your maximum hollowing depth may not be sufficient.

Next comes the fun stuff. Place the rod vertically into a vise or clamp, mark the center with a marker or better yet scribe a couple intersecting lines with a nail, awl or X-acto knife. Use a center punch and punch the center for ease of starting the drilling.



Since there are rotational forces that will be working on the bit when in use, it is also a good idea to add a set screw or two to the side of the rod to prevent the bit from twisting. Some turners use superglue for this which seems to work fine, although it makes bit replacement more difficult.

An easy way to mark the side of the rod for the set screws is to simply run a file across the side with one pass while keeping the file held in a consistently “flat” angle. This will mark the steel with a small shiny flat which can then be used as a reference. Making sure the



reference line is at the top, scribe marks for your screw hole locations. The marks shown are at  $\frac{1}{4}$ " and  $\frac{7}{8}$ " from the rod end, but the locations are not critical as long as you assure that the screws will in fact make contact with the bit when inserted. Punch these locations for drilling as well.

Place the rod into a drill press, up through the center hole in the table and clamp it in place. If your rod



won't fit or drill press table has no hole then you might alternatively tilt the table 90 degrees and clamp accordingly. I use a wood screw clamp with a "hole" in the jaws to grip the rod. Drill a pilot hole in the rod with a spotting drill or other, preferably small and short drill that will not wander such as a  $\frac{1}{8}$ " bit. A spotting drill is made specifically for this, to be strong and not wander

from the center punched dimple. Be sure to apply sufficient cooling oil during drilling or smoke is all you will get. The 3-in-1 oil brand is suitable, even motor oil if you're desperate.

Once a pilot is drilled switch to the larger diameter drill bit which will accommodate your tool bit shaft and re-drill the same hole to desired depth. For the hook tool, since the bit shaft is  $\frac{1}{4}$ " dia. I use a  $\frac{5}{16}$ " drill bit which allows for shaft imperfections but is small enough for good support. The hole depth is about 1 inch. Don't worry if the hole isn't straight or exactly centered either. Do your best, but when you're using the tool to cut the wood "will never know". This process can be done with a hand drill if due care is taken. The results will perhaps not be as precise but the end result will work fine.

Remove the rod and re-clamp it horizontally for drilling the set screw holes. Again use a spot drill to prepare and then re-drill to a size appropriate for the set screw. A #29



drill bit is needed for 8-32 x  $\frac{3}{16}$ " set screws.

There's a useful drill size conversion chart at <http://www.csgnetwork.com/drillsizeconvert.html>. A #29 is actually 0.1360", a tad under  $\frac{3}{64}$ ".



Once drilled, tap the holes with a hand tap using oil again, and you're almost done. In fact the only tasks left are cleaning up and assembly.

To ensure that the rod

will fit into a hole drilled into wood for a handle if desired, grind the back end of the rod slightly easing the sharp edge and removing any burrs. Additionally, it's usually a good idea to round the working end of the rod a bit to prevent a sharp edge from causing injury or scratching your work. It's as easy as rotating the end of the rod against the grinding wheel, raising and lowering the far end until satisfied. If a nice shine is desired you may buff the steel or use sandpaper or Emory cloth to bring out the finish desired. Lastly, insert the tool bit and tighten the rear set screw ensuring it grabs the bit. Then install any other set screws. You may need to file the heads of the set screws slightly to bring them down to the surface of the rod, but be sure to leave enough hex socket to remove them later. If they are too long, remove them and grind down the other end. Congratulations — You're a machinist!



You can use this rod to hold many styles of bits like these below:

- Hook Tools for open form end grain hollowing
- Ball End Mills for open form end grain hollowing
- High Strength Cobalt steel tool bits for closed form hollowing (i.e. Ellsworth)

## Sources:

M2 Hardened Wolok Hook tool bits ~\$30. Mitch Wolok is in the AAW directory under Florida.

Andre Martel Hook tool bits: \$40 to \$90 depending on size at [martel.public.netc.net/MHT.html](http://martel.public.netc.net/MHT.html)

Ball End Mills are about \$15 from Enco ([www.use-enco.com](http://www.use-enco.com)) or MSC ([www.mscdirect.com](http://www.mscdirect.com)). The same sources carry Hard Tool Steel bits (\$3) and 1/8" Spotting Drills (\$3)

These are normal hardware store items:

5/8" Steel Rod - 36" lengths \$11 at Lowes

8-32 x 3/16" Set Screws - 0.20c

8-32 Tap - \$3

#29 High Speed Twist Drill bit - \$3

5/16" High Speed Twist Drill bit - \$5

3-in-1 oil or cutting & tapping fluids - \$3

*Make your own hook tool* by Alan Lacer at [www.alanlacer.com/Articles.html](http://www.alanlacer.com/Articles.html)

*Info on Hook Tool* by Mitch Wolok, on CNEW website



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## Other Open Shops

Nobody showed up at Hank Cahill's.

Phil Bowman hosted Steve Reznek and Will Hunt, who demonstrated the pointed inlays described in last November's newsletter.

Reid Gilmore's only guest was Jon Berke. They worked on a small hollow form in ambrosia maple, which may be finished by the March meeting.

Joe Harbey had a successful evening but I don't have a write-up or photographs.

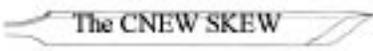
## Open Shop at Mike Peters Mary Maguire

Here are the photos from the open turning at Mike Peters. I took photos of the table he made for his midi lathe so I could copy it for my lathe.

Mike gave me some great pointers I enjoyed it very much.



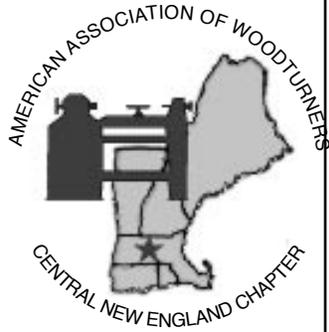
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