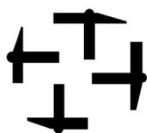


# The Cold Drill;

# Reconstruction of an Anglo-Saxon Tool

---

Dennis Riley



**Daegrad Tools**

Sheffield England

daegrad@hotmail.co.uk

©Dennis Riley, 2012

## New ideas

Reconstructive archaeology provides us with a portal into the past, in the context of this paper; the recreation of period tools and an analysis of their products and use. This work concerns itself with the cold drill, a device for producing holes in both ferrous and non-ferrous plate and conversely for producing flat round disks for a number of period applications. It is easy to presume what may or may not work or to what technology the Anglo-Saxons possessed, extant tool finds are highly restricted in creating a view of the tooling of the day as finds were not systematically deposited in graves- quite the opposite, grave finds are thin on the ground. Settlement sites provide us with much more information; however this is also slight as the finds here are presumed to be casual loss items, given the materials of the time and the products constructed from them the number of tools used and available to the Anglo-Saxons would have run into the hundreds of different designs ranging from large items such as axes and down to small tools such as burins, files and of course the cold drill.

As with most tools extant finds are minimal and in many cases open to a number of alternate uses, a presumed cold drill was excavated in the mastermyr hoard<sup>1</sup> (Circa 1000AD) of nominal size 16mm diameter and also a possible cold drill from the smiths grave at Tattershall Thorpe in Lincolnshire<sup>2</sup> (Circa 670AD) although this is described as a graver (find 18) but could function as a cold drill. It can be said that any bar of round, square or oval cross section with a flat face could function as a cold drill so many other drills may have been recovered but miss catalogued as just iron bars of unknown function.

## The Cold Drill- Design

The cold drill is one of the simplest designs possible consisting of a flat faced iron or steel bar, ground flat with a sharp 90° edge, the plate to be cut is placed on a suitable backing- the end grain of wood; which allows uniform collapse when struck, The cold drill is placed flat against the plate and struck with a

---

<sup>1</sup> Arwidsson & Berg

<sup>2</sup> Hinton

©Dennis Riley, 2012

Hammer, this causes shearing of the parent metal and the drill punches through the plate, the parent metal is deformed in the process (as shown in figure 2), the process of punching is shown in figure 1, once the cold drill is removed –and in the experiment undertaken here a 8mm diameter drill was used on a 0.8mm copper strip, the plate is heavily deformed and requires re flattening before another disc can be struck and as can be seen the flattened hole is smaller than the diameter of the punched disc as the parent metal is drawn in the punching process. By using the end grain of the wood a uniform compressive bed allows for clean distortion free punching, the resulting disc is forced into the end grain requiring removal with a small sharp awl. The resultant pressed disc is 8mm diameter with a sharp well defined edge against the punch plate and the opposite side has a rounded edge, during these experiments no lubrication was used. **Fig 1,**



**Fig 2;** *deformation of the parent metal around the cold drill and the resultant punched disc*

## Cold Drill applications

The cold drill lends itself to two principal applications; the manufacture of holes and discs, limiting factors on the size of holes that can be made are the material itself and its thickness, with a large cold drill and hammer it is entirely feasible to be able to punch thin steel sheet up to 2” (50mm) in diameter but with thicknesses up to a maximum of 1 to 1.5mm, consequently anything

smaller than that is quite achievable in any non-ferrous material, punch experiments with a small cold drill of 2mm diameter have given excellent results in punching annealed mild steel sheets of 1mm thickness with an obvious application in the manufacture of buckle plates (please refer to the punch plate experiment later), once the deformed hole is beaten flat it is smaller than the cold drill diameter but once you have a standard rivet it is with little difficulty that a cold drill can be made of larger diameter to compensate for hole shrinkage on flattening.



**Figure 3;** 6mm cold drill used on 1mm steel plate with the punched discs embedded in the end grain awaiting removal

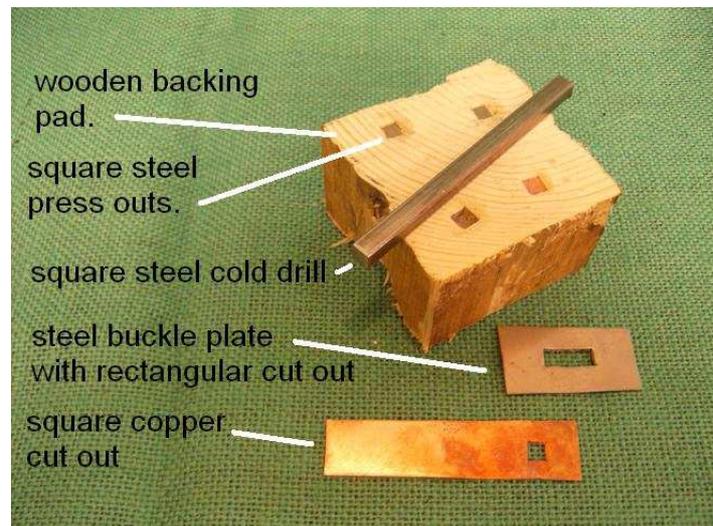
The other application is in the manufacture of discs and as shown in figure 4 an application in the manufacture of domed rivets for decorative mead buckets is an obvious use and also in the production of coin blanks for minting. The blanks produced in the cold drill are consistently accurate in size with a well-defined edge requiring little if any further work.



**Fig 4;** domed, soldered composite rivet on a mead bucket from Dover Buckland Anglo-Saxon cemetery

## Buckle plate production

As a further experiment a square mild steel cold drill was used to manufacture a buckle plate blank (of no particular find), the equipment used is shown in figure 5 below, the experiment consisted of the manufacture of a square hole in an annealed copper strip of 0.8mm thickness, as figure 5 shows the hole punched was clean and well defined, carrying on from this the same cold drill was used



**Fig 5** to punch a series of holes in a 1mm thick annealed mild steel strip- a process known as “nibbling” to produce an accurate slot requiring minimal dressing, the final slot being around 5mm wide and some 12mm long. The process used no lubrication, was quick, simple and in a few minutes produced a tongue slot ready for the next process, this method is clearly viable in the production of buckle plates and it is possible that some of the square bar finds from some Anglo-Saxon graves would have been suitable for this purpose

## Conclusion

Experimentation has shown that the cold drill is a simple but very effective tool for the production of holes in punched plate; both ferrous and non-ferrous, the hole is well defined as is the punched “coin” it produces giving rise to a number of design applications for both products, use of the cold drill does require some skill (as does all tools) and a degree of strength especially on the larger diameters. The small experiments conducted here show the versatility of the tool and a number of its applications.

# Bibliography

**Arwidsson, G. & Berg, G.:***The Mastermyr find; a Viking age tool chest from gotland.* Larson publishing company, Lompac California, 1999.

**Hinton, D.A.;***A smith in Lindsay- The Anglo-Saxon grave from Tattershall Thorpe, Lincolnshire.* The society for medieval Archaeology, London , 2002.