

Making Bradmore's arrowhead extractor.

I was approached by "Lion Television" who were making a programme on "Royal deaths and diseases" to see if I could make an arrowhead extractor to be used in one of the programmes. This extractor was the one used to extract an arrowhead from Henry Prince of Wales (later Henry V) after the battle of Shrewsbury in 1403. I was told that the only information they had about the extractor was a 1736 translation of the original surgeon's document which they would send me. The document described how the surgeon John Bradmore removed the arrowhead from the Prince's head using an arrowhead extractor. In the document was a drawing of what they thought the extractor looked like along with its description. The description and the drawing did not seem to make any sense no matter how many times I read it through. Normally when I embark on such a project I like to try and put myself back into the time when the artefact was made and try to think in the same way as the person making the object. With this document there was not enough information for me to even start thinking in the same way as John Bradmore so I contacted Lion Television to put them in the picture and explain my dilemma. After explaining the situation to the director of the programme I was told that they had made contact with a lady who had re-discovered the original manuscript while doing some research on John Bradmore. This was exciting news as it was thought that the manuscript had been lost and for it to turn up at such an opportune moment was unbelievable. I was asked if I would like a translation of the original document that was written in Latin to see if it made more sense to me than the 18th century translation and would I like to speak to Dr. Lang who found the document? This offer was readily taken up and I awaited the arrival of the translation in eager anticipation.

When the translation arrived and I read it through the whole project began to make sense. Part of the confusion was the fact that I had been thinking as a blacksmith and the word tongs to me meant pivoted tongs used to grip hot metal. This did not fit in with the way the extractor description operated. On reading Bradmore's manuscript I thought "sugar" tongs and the whole thing began to make sense. By thinking along this path and a conversation with Dr. Lang I could see how the extractor would operate. All I had to do now was work out how John Bradmore set about making his extractor.

The key words for me were John Bradmore writing "I made new tongs". In other words he went down to the workshops at Kenilworth castle and made the extractor. This was quite something as he had a prince of the realm with a wound that could prove fatal and it was his job to extract the arrowhead and save the Prince's life. If this is not thinking on your feet then I do not know what is! I could now get myself into the mind of Bradmore and picture the castle forge and the facilities that were available to him. The drawing of the 18th century extractor still made no sense so I had to rely on Bradmore's description. Bradmore was not only a surgeon but also a member of the Goldsmith's Company which implies that he had a degree of skill in metalworking and knew what he was doing. He talks of making a screw so the question was how did he make a screw thread with the facilities available to him? In the 15th century screw threads were formed by either filing or forging. The quickest and easiest way at that time was to forge threads and this is the option I chose to use. To do this I had to make a simple forming tool that would enable me to forge the required thread on the screw bar. Forming the thread on the bar was easy after a little practice so the next step was to work out how the thread was made in the main body of the extractor. As the main body of the extractor was made from a thin strip of metal and the thread on the bar was quite a coarse thread by modern standards it was not possible to cut an internal thread. The thread was formed by punching a hole in the strip, thinning it down to the thickness of the thread pitch and then making two chisel cuts on opposite sides of the hole. The strip was then heated up and the finished threaded bar turned through the hole thus forming the shape of the thread. This method worked well as there was no great pressure needed on the screw to enable the arrowhead to be extracted. The forging of the main body of the extractor involved thinning down the strip some seven inches at each end to enable each end to be formed into half a tube. This tube had to have a maximum outside diameter of 10mm with sufficient internal clearance to allow the threaded bar to pass down to the point of the tube. The hole for the threaded bar to screw into was then formed and the centre portion was then forged round to the shape necessary to pull the extractor out of the wound, along with the arrow head. When all the forging was completed the tube

part of the extractor was ground and polished so that it would be as clean as possible to avoid any transfer of infectious material into the wound. It was now time to test the finished extractor. I lightly hammered a war bodkin of the type used at that time into the top of the bench, inserted the end of the extractor into the socket of the arrowhead, tightened up the screw and with a slight rocking motion pulled the arrowhead out of the bench.

I now had an extractor that worked and so waited for the day when Dr. Lang and the film crew came to film the making of the instrument. When they came they brought along a photo-copy of the original manuscript for me to see. Dr. Lang was familiar with the manuscript but had not seen my extractor. You can imagine my delight when I saw the manuscript and half way down the right hand side was a small sketch of the extractor that matched the one I had made, and Dr. Lang's delight when she saw my extractor matching the one in the manuscript. Q.E.D.

Ref.

BM Harleian Collection. MUS.BRIT.BIBL.HARL.1736 PLUT.XLIV.B

R T Beck, The Cutting Edge, London. 1974 pp117-8

Hector Cole.

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