

THE MANUFACTURING METHOD FOR 'THE STATIONS OF THE CROSS'.

By Graeme Hocking January 27th 2016

Extract from Minster Stewards training December 2015.

As you know TSoTC are a series of sculptures by Jonathan Clarke made to depict the journey of Jesus from Pilates house to Golgotha along the 'Via Dolorosa' although the exact route that was taken is unknown.

The reason for this particular session is not to expand on the individual stations of the 15 pieces but to explain how the sculptor actually made the pieces, the method of production.

Historically the process called lost wax casting is one that has been known about and used for a long time. No one knows who first used it but suggestions are from India, Africa or South America.

One suggestion of how the process started is that metal ore in rocks used to contain a fire would heat sufficiently to produce puddles of metal which formed different shapes according to what the metal flowed into. From this, moulds were made to contain the molten metal and make useful or decorative metal objects.

We can only guess how wax was taken from wild bees, formed into a shape, buried in sand and then perhaps melted out by a fire or a basic oven and then the metal poured into it. Inevitably the process becomes magical and from generation to generation improved. The process today is still very similar but using specialised materials and modern day equipment which can be used to make re-useable moulds.

One such modern material is expanded polystyrene and it is this that the pieces for TSoTC are made first. So how is it done? Expanded polystyrene can be easily cut using hot wire and easily wasted from a block by surform, file or any other similar cutting tool and finished off by using glass paper (the modern equivalent to sand paper) to smooth it down.

Polystyrene patterns have 2 main disadvantages:

1. They are not reusable and
2. The fumes that they give off are toxic in quantity. You can get round this problem by using plenty of ventilation and extraction fans.

However this material lends itself to both 2 and 3 dimensional sculptural forms that can be quite complex and use can be made of the textured surface that remains if required.

Having made your polystyrene pattern a runner and a riser are attached, and the whole thing is buried in a casting box and then packed hard with casting sand, ensuring that

there is a good area of sand all the way round the pattern. The casting sand will have previously been dampened with water to enable it to bind together, but not too wet or else it will produce large quantities of steam, which could build up in the box and blow the moulding out.

An aluminium alloy is melted in a casting crucible and a temperature of around 700 to 800 degrees C is needed to ensure that it is viscous enough to pour it satisfactorily into the mould. Gasses and impurities may need to be removed from the molten metal by dropping in a de-gassing tablet which is pushed to the bottom of the crucible using a plunger. A reaction will occur which will produce a layer of slag or dross to form on the surface of the crucible which can be removed with a ladle before pouring starts. Then the fun bit, you pour in at the runner and once the molten metal burns away the polystyrene pattern and takes the void left behind, molten metal appears up the riser.

That is it. Leave the metal to cool and set and remove from the box.