Glassblowing with the Time Team Live in York

Once again Roman glassworking has featured on the Time Team, archaeology's popular front. On this occasion the criteria and aims had been changed from the first televised experiment in 1995, when John Shepherd, Gilbert Burroughes and Ed Iglehart reproduced a Roman furnace from scratch, and blew some melted Roman glass. In September 1999 the pace was more frenetic to match the rigours of a Time Team Live weekend, but the aims of the experiment more relaxed: using modem materials to build a Roman-style furnace, fire it with wood, and blow a replica Roman vessel from glass made with modem ingredients, based on a Roman recipe. In addition, of course, it had to make good television. In the event, the weather was brilliant, the finished vessel highly photogenic and, to cap it all, some valuable information resulted from the project.

The 1999 team comprised Beryl Hines, a potter who has done a lot of work on experimental pottery kilns of Roman and later types, her regular team of three stokers and kiln-builders, Mark Taylor, who is well-known as a glass-blower making replica Roman vessels, and David Hill his business partner, engraver and glass-blowing assistant. I was introduced to the project at a late stage as a substitute Roman glass expert, and enjoyed the whole experience greatly.

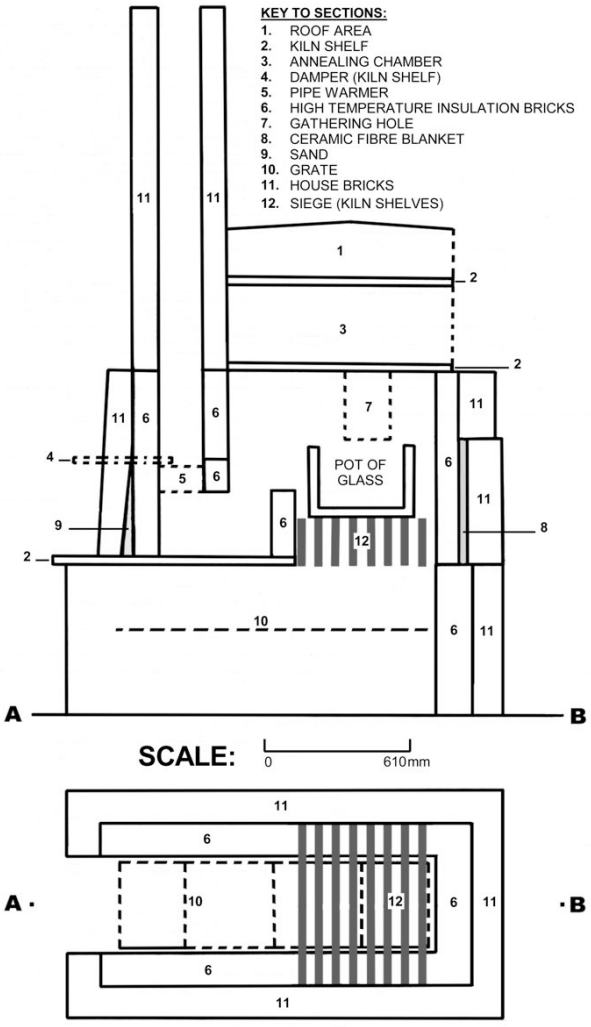
The strict time-scale imposed by the 'Live' weekend was artificial but proved to be informative. It meant that the finished vessel(s) did not have time to anneal properly, and have subsequently cracked, but it showed that such workshops could be up and running in a very short time, produce vessels to satisfy a local market, and be gone again in a matter of days leaving nothing for posterity but a patch of burning and a few dribbles and fragments of glass. In this case the furnace was built between 8am and 9pm on the Friday, and fired at 6am on the Saturday. At midday the temperature had reached l000°C and the glass was put in; temperatures above 1100°C were maintained until late Sunday morning, when Mark started his glass-blowing. Stoking stopped at 2.30pm, the temperature dropped rapidly, and on Monday morning demolition commenced, finally leaving little evidence of our activities.

The Furnace

The finished furnace was described by the programme presenter as a 'brick steam-engine', and actually this wasn't a bad parallel. The design and construction were all Beryl's, drew heavily on her experiences as a potter, and worked well. This section and plan (right) were drawn by Mark Taylor, and are largely self-explanatory. Problems and future improvements can be briefly summarised thus:-

- The pot for the glass, built in to the furnace, cracked, resulting in very slow dripping of glass into the fire. This may have been caused by a weakness within the fabric of the vessel.
- The 'chimney'/flue may not have been necessary and the omission of this from the structure would make the furnace look much more like the few Roman and medieval illustrations to have survived. More gathering/glory holes, which could be opened and shut, instead of a chimney should produce the same effect and ensure good combustion and high temperatures.
- A sunken firebox would achieve greater insulation and would lower the height of the gathering hole - (this again would leave remains more closely akin to those excavated from the Roman period).

The grate, supplied by Beryl, was made of mild steel, and just as the filming finished, it melted and collapsed, It had been necessary because cut slab wood was being used. If coppiced wood was used, i.e. with a rounded rather than rectangular cross-section, the grate would be unnecessary - air would be able to circulate between the rounded trunks and branches.



Fuel and Stoking

The whole experiment used one and a half truck-loads of wood off-cuts as fuel. The furnace had to be stoked constantly, and a relay team was organised to get through Saturday night (serenaded at first by the entertainers on the Ouse riverboats moored nearby). When the time came to blow the glass, Mark found that he communicated closely and increasingly skilfully with the stokers (or 'teasers') to correct drops or rises in temperature, so that the glass was in just the right state of fluidity. This close working relationship came as a surprise to someone used to working with a gas-fired furnace.

Annealing

The annealing chamber did not reach the required heat, and should have been bigger, with a removable door (the front was left open). The temperature could be judged by suspending a thin glass rod between two points and watching for sagging to occur. The gradual lowering of the temperature necessary for successful annealing is tricky to achieve, but could perhaps be done by moving the vessel nearer to the door. It would then have to be removed whilst hot (c.550°C) and cooled slowly over about 12 hours in a pit of hot ash or sawdust. A hot ash pit was used here, but sufficient time was not allowed for the annealing to be completed.

There were, of course, several 'Time Team jugs' produced by Mark - he practised several times before the cameras arrived, and the first finished article was perhaps the greatest moment of triumph. Apart from the fun of the filming, and despite the wide brief a1lowed by this rather eccentric-looking experimental furnace, it is worth recording that all the improvements felt necessary if this should be done again would bring the structure closer to the early illustrations and archaeological evidence. As we moved towards these conclusions, the York weekend allowed us to imagine ourselves taking some of the same tentative first steps as the earliest glass-workers.

Dr. Denise Allen (2000) “Glassblowing with the Time Team Live in York” in Glass News 7/8, June 2000, pp. 2 - 3.