



c/o Scientific Generics Limited  
Harston Mill  
Harston  
Cambridge CB2 5GG  
Telephone: +44 (0) 1223 875200  
Facsimile: +44 (0) 1223 875201  
(Organising Secretary's Home Number: 01799 525 948)  
email: [richard.freeman@genericsgroup.com](mailto:richard.freeman@genericsgroup.com)  
CAMBRIDGE SOCIETY FOR THE APPLICATION OF  
RESEARCH

## The Iron Bridge at Coalbrookdale

Bill Blake

English Heritage Metric Survey Team

Monday 20<sup>th</sup> January 2003: 7.30 p.m. - 9.00 p.m.

*The Wolfson Lecture Theatre, Churchill College, Cambridge*

**Chair and VoT:** to be announced

**Bill Blake Writes:** (see also [http://www.theolt.com/billcipa/ironbridge-cipa\\_1.htm](http://www.theolt.com/billcipa/ironbridge-cipa_1.htm))

"Modelling the bridge required a compromise between model integrity and CAD performance. The bridge comprises some 1420 cast parts (excluding fixings and fasteners): to model all the parts and their variants as full size replicas would generate a file size of approximately 500mb, unusable without extensive computer resources. It was decided that there should be a tolerance of up to 35mm surface to edge variation to economise on surface generation for the solids used. Where it can be inferred parts have a path through each other this has been interpolated in the model. Many joints are indistinct as they have been caulked with molten lead to fill voids and the internal spaces of the joint housings can only be estimated. As with simpler CAD models and drawings layering was used to separate the data by location, part name and phase.

The model was built in AutoCAD 2000 using the solid modelling tools: it comprises 1800 components and has been developed using 3dStudioMax."

### **Organising Secretary's notes:**

I came across Bill Blakes' work when I attended an English Heritage Seminar on the Iron Bridge earlier this year; I was enchanted by the power of the CAD material they presented, and discovered that it originated from their Metric Survey Team, where Bill works

The technology enables monuments to be reduced to a CAD file which can then be manipulated. Such technology enables one to 'fly' through long-lost buildings, but it also enables one to work out how the constructions were put together in the first place. In the case of the Ironbridge, the methods were distinctly unorthodox. This is not surprising, since it was the first such example in the world, built by the Iron Baron Abraham Darby as a shop window. A very early example of marketing, in fact! ([http://www.sedgleymanor.com/abraham\\_darby.html](http://www.sedgleymanor.com/abraham_darby.html)).

The CAD file enables one to 'fly around' the 1400 or so pieces of iron from which the bridge was constructed, and work out how they were put together.

21<sup>st</sup> Century state of the art technology meets the same from the 18<sup>th</sup> Century!.

**Richard Freeman**, CSAR Organising Secretary

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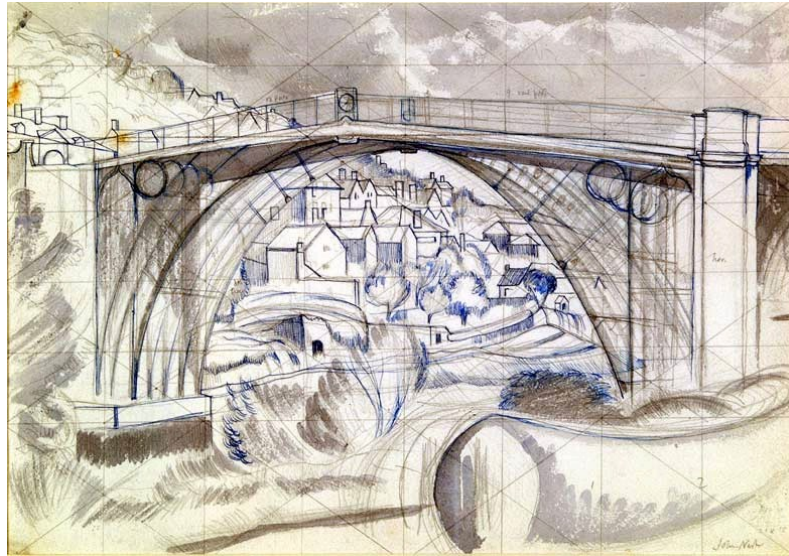
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*Italics denote an affiliation other than the University of Cambridge.*

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### Contemporary Quotes:

“The approach to Coalbrookdale appeared to be a veritable descent to the infernal regions. A dense column of smoke arose from the earth; volumes of steam were ejected from the fire engines; a blacker cloud issued from a tower in which was a forge; and smoke arose from a mountain of burning coals which burst out into turbid flame. In the midst of this gloom I descended towards the Severn, which runs slowly between two high mountains, and after leaving which passed under a bridge, constructed entirely of iron. It appeared as a gate of mystery, and night already falling, added to the impressiveness of the scene, which could only be compared to the regions so powerfully described by Virgil.”

*Italian visitor, 1787, Wolverhampton Chronicle, 1790*

“...the flaming furnaces and smoking limekilns [which] form a spectacle horribly sublime, while the stupendous iron arch, striding over the chasm presents to the mind an idea of that fatal bridge made by sin and death over chaos, from the boundaries of hell to the wall of this now defenseless world.”

*from Charles Hulbert, A History and Description of the Country of Salop, 1837*

