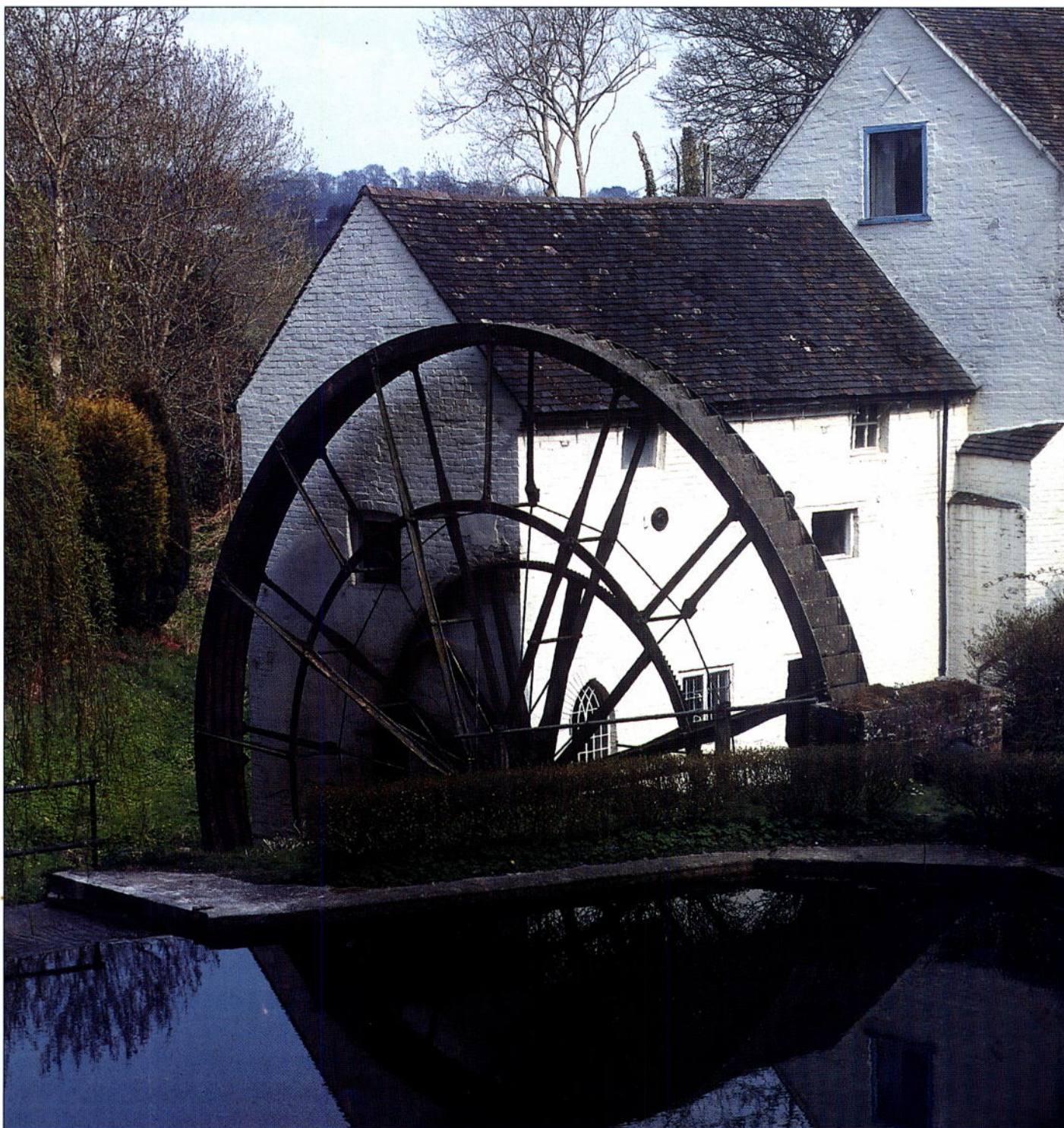


# INDUSTRIAL ARCHAEOLOGY NEWS

**126**  
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2003

THE BULLETIN OF THE ASSOCIATION FOR INDUSTRIAL ARCHAEOLOGY

FREE TO MEMBERS OF AIA



Ironbridge weekend • underground quarry • Hordle coal yard • SS Robin  
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# INDUSTRIAL ARCHAEOLOGY NEWS 126 Autumn 2003

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AIA Office, School of Archaeological Studies,  
University of Leicester, Leicester LE1 7RH  
☎ 0116 252 5337, Fax: 0116 252 5005  
e-mail: AIA@le.ac.uk

## Website:

www.industrial-archaeology.org.uk

## Ironbridge Weekend 2003: Power in corn and textile mills

*The annual AIA Affiliated Societies Weekend, held at the Ironbridge Institute, Coalbrookdale, over 12-13 April was one of the best attended for many years and the theme of 'Power in Corn and Textile Mills' proved a popular one indeed.*

Ray Riley

Beginning the proceedings appropriately with an analysis of waterwheels, Jeff Hawksley outlined the various methods that have been employed to maximise the amount of energy from the water available. Sluices were used to increase the speed of flow of slow running streams, but undershot wheels suffered from the dissipation of energy caused by the collision of water with the blades, known as shock loss; their efficiency was only 30-33%. Wheels using the gravity principle were by contrast 60-65% efficient. Low breastshot wheels were 40% efficient and high breast or pitchback wheels were an improvement on this. Jeff illustrated the importance of bucket shape in efforts to retain water for the longest possible time, and commented on factors controlling wheel speed: flow, head, drag from the stones and the governor.

Water turbines, for which an efficiency of 70-80% is claimed, may have been especially important in coal-short countries like France with abundant water supplies, but they were nevertheless much used in Britain after the 1880s, and in the 1920s for the generation of electric power. Alan Crocker has made a special study of turbines, and from catalogues has found that there was an almost bewildering array on

the market, produced by such makers as Armfield, Gilkes, Green & Carter, Howes & Ewell and Macadam Bros. in Belfast. He discussed the principles of the various types of turbine, and noted that between 1869 and 1950 there were 117 in operation in Surrey, of which 30 were in mills and another 30 in waterworks. Alan suggested that similar comprehensive studies might be undertaken for other counties.

Switching from general principles to restoration practicalities, and from water to wind power, John Boucher began by arguing that the best method of conserving windmills is to keep them in operation, the minimisation of maintenance costs being a vital consideration. While retaining the original fabric as far as possible, rotten wood has to be replaced, steel is frequently a replacement for iron, and present day health and safety requirements such as fire escapes have to be built in, as does electricity for evening visits. The use of modern equipment unavailable to the original builders, such as power tools and cherry pickers, facilitate the lifting of sails and indeed caps, at the same time allowing a new cap to be fabricated on the ground. Inevitably money is an ever-present issue.

In the final talk on Saturday morning, Mike Williams outlined the features of the steam power system in textile mills: engine house, engine, boiler house, chimney and power transmission, whether by shaft or rope drive. Having done that he reported on an investigation into steam power in south west England, where some 92 sites were discovered. In contrast to Manchester, where demolition is the usual fate, in



Ironbridge Weekend delegates inspecting the large waterwheel at Daniel's Mill

Photo: Peter Stanier

### COVER PICTURE

*Daniel's Mill is a particularly attractive industrial site near Bridgnorth in Shropshire. It was visited on the occasion of the AIA Ironbridge Weekend on 12 April 2003 (see this page for report)*

Photo: Peter Stanier

the South West re-use is common. Furthermore, many sites showed evidence of steam power having been added to the original water power structures.

After lunch a visit was made to Daniel's (corn) Mill in Bridgnorth, where flour is ground by courtesy of a 38-ft diameter waterwheel. Half the group was conducted round the mill by a guide whose idiosyncratic delivery was pitched at Women's Institute level, despite the many trenchant questions put to him. For some, the highlight was a Severn Valley train puffing along the viaduct behind the mill; the organisers had to admit that this was an unscheduled add-on. Subsequently the derelict Benthall (corn) Mill adjacent to the Iron Bridge itself in Ironbridge was inspected. Jonathan Briggs produced some historic photographs which gave rise to lively discussion about what was now to be seen. Further tests of the imagination were made at the after-dinner quiz, where bizarrely enough the right answer to many of the questions was not 'yes' or 'no', but 'nonsense'. Chris Irwin was the winner.

The Sunday morning session was kicked off by Alan Stoyel, who has undertaken a thorough survey of textile mills in south west England. Reliance was placed on water power for much longer than in Yorkshire, for example, and indeed a water-powered mill was actually built as late as 1890, while water-powered machine shops were by no means rare. Yet few turbines were installed. A small number of fulling mills has survived – the *louvres* on one suggesting that cloth had been dried within the mill. Not only were mixed use mills present, but also some mills had provision for hand processing, scotching the notion that hand looms belong exclusively to the domestic phase of the industry.

It may not have been a common event, but certainly from time to time post mills were shifted from one site to another in the eighteenth and early nineteenth centuries. Peter James described the trials and tribulations of moving Lowfield Heath post mill, near Gatwick airport, some three miles to another site much more recently, in 1987. As John Boucher had earlier demonstrated, modern technology facilitated dismantling, transfer and rebuilding, and similarly as much as possible of the old fabric was retained. Purists may object, but without such strategy a working mill would be an impossibility, while in any case repairs are constantly carried out during the life of any building.

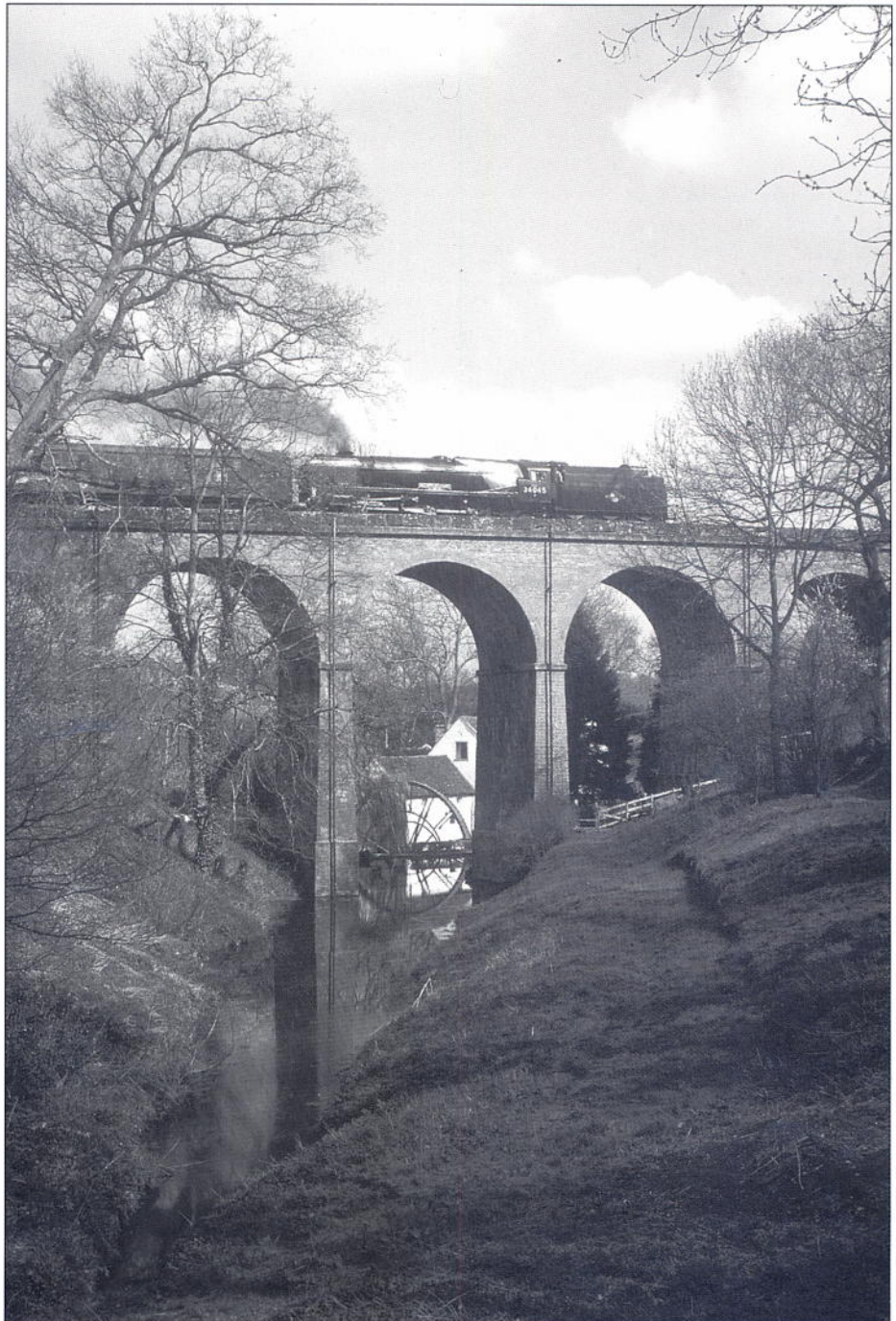
In the final presentation Jeremy Milnn described in considerable detail the evolution of power provision at Quarry Bank Mill, at Styal in Cheshire. His research made abundantly clear that as the mill grew in size and as new technology made its appearance, so there was constant modification to power supply. Since the mill was built in 1784, it is hardly surprising that the tracing of change has been very much a piece of detective work. Thus waterwheels were added in 1801 and 1807, an iron suspension wheel was in place by 1820, in 1824 a Boulton & Watt steam engine was installed, a relatively small horizontal engine came to power the mechanics' shop, and towards the

end of the century a large turbine was put in, working until 1959. One wonders about the hours involved in research were the exercise undertaken for other large mills in the country.

Rounding off the weekend, there were three members' contributions. Tony Bonson reported on Park (corn) Mill at Congleton, Cheshire, a Grade II\* listed building, where not only the conversion plans of 1833 signed by William Fairbairn have survived, but also much of the machinery featuring in the drawings. The mill is thus an important testimony to the work of this celebrated engineer. Tony Yoward treated the audience to an account of his early involvement in IA, and then described the corn mill archive which he, together with SPAB, have created. Some 20 substantial donations, including those

from Ken Major and Alan Stoyel, have been received, and it is planned to proceed on a county basis. Furthermore, some 30,000 millers and millwrights are included in the archive. It is anticipated that the archive will be on-line in August 2003. Derek Brumhead spoke about the development of power at the 1788 Torr Vale (textile) Mill at New Mills near Manchester. It is Grade II listed, but lacks machinery; its future is doubtful. Derek led a visit to this mill at the Manchester AIA conference in 2000, and for those present the slides shown had additional relevance.

The conference attracted 51 people, suggesting the popularity of themes focussing on particular industries. However, corn and textile mills may be a hard act to follow.



*A steam train of the Severn Valley Railway passes over the viaduct that overshadows Daniels Mill*

*Photo: Peter Stanier*