

#### CHELMSFORD'S INDUSTRIAL MONUMENTS

*The problems of protecting industrial buildings of the twentieth century are many and great. The buildings are often very large, they are very numerous, and they have often been altered substantially as their uses have changed. The legislation for their protection has evolved from policies devised for other kinds of buildings. New ways are having to be found to give recognition and protection to twentieth-century industrial monuments, and progress may be too slow to save many of them. This article puts one view of the problem.*

To many people interested in industrial archaeology Essex conveys the idea of a large agricultural region which the industrial revolution almost passed by. Yet it was the birthplace of another industrial revolution, as important or more so than its predecessor. Its Ironbridge was Chelmsford, in the mid eighteenth century a sleepy little market town. Its revolution was the birth of electronics and electric power engineering.

A group of engineers and scientists have worked over the last twenty-five years or so to see that all that had so dramatically happened is carefully recorded. A plaque was affixed to

Guglielmo Marconi's first factory in Britain, 'The First Radio Factory in the World—1897'. Mercifully, the building was still intact. It had been taken over by Marconi's infant company from a furniture warehouse. This still had a Clayton and Shuttleworth steam engine and line shafting installed by Samuel Courtauld's silk weaving company who were the occupants in 1868. The original builder was John Hall, a silk thrower. His factory was well built out of the local brick and is now the headquarters of the Essex Water Company.

Colonel R.E.B. Crompton established a factory in Chelmsford in 1878 where he pioneered the development of the central electricity generating station with his manufacture of high output dynamos and ancillary distribution equipment. A disastrous fire destroyed these Arc Works in 1895, whereupon Crompton moved to a bigger site in the town and let what remained of his previous premises to Thomas Clarkson who commenced the manufacture of steam omnibuses there in 1904.

About nine years ago, it became apparent that the original Crompton site was 'ripe for development'. The second Crompton works had by now been taken over by Hawker-Siddely and shut down with the usual pattern of redundancies. Crompton had disappeared forever. His remarkable historic collection of

electrical generating and measuring apparatus had gone to the Science Museum. The Chelmsford Society applied to the Department of the Environment to list the surviving bay of Crompton's historic first works. It was refused as 'not of sufficient architectural or historic interest'. However, seven years later a direct appeal to Lord Montagu through the Chelmsford Industrial Museum Society secured the listing. The appeal was a matter of urgency since a planning application had been made to demolish and to erect housing. A plaque has now been affixed by Chelmsford Museum Service and the new houses have been built quite successfully around the building.

Ernst Gustav Hoffmann was brought to Chelmsford from America to exploit his patent method of high precision ball bearing manufacture. His factory was built on its present site in 1899. The existing Coventry cycle makers soon were major customers followed by car makers newly freed from the 'red flag'. A.V. Roe and De Havilland brought their flimsy machines to the works to have their JAP engines fitted with the new bearings, and later along came Diesel. Hoffmann bearings of all sizes gave a terrific impetus to British machinery and vehicle manufacture. The workforce, expanding to several thousands, caused a housing problem in the town. In 1989 Hoffmann's, taken over yet



Marconi's New Street Works, Chelmsford  
Photo: L F Roberts



The remaining portion of Crompton's first works, Anchor Street, Chelmsford

Photo: L F Roberts

again, left Chelmsford. The land, apart from the small part occupied by County Council offices, is 'ripe for development'. One bay is the original 1899 building and English Heritage was applied to for listing about a year ago.

Marconi's great New Street Works was their second in Chelmsford. Built in 1912 it is arguably the first purpose built radio factory in the world, although Telefunken have some reservations about this. Two masts over 400 feet tall towered over the factory, which was strategically sited next to the Great Eastern Railway goods yard. From these works the most powerful spark station in the world maintained contact with ships at sea and land stations. After being commandeered by the Admiralty during World War I the works saw a development which had been incipient towards the end of that conflict. In January Marconi's had perfected a new powerful telephony transmitter. The rest of the story is known around

the world. The Daily Mail got in on the act and sponsored a broadcast from Chelmsford on 15 June 1920. The great soprano Dame Nellie Melba was brought to the works and gave a song recital which was received as far away as Newfoundland and Persia. The Post Office clamped down on further transmissions and issued a complete ban. The loud public



Marconi's first works, Hall Street, opened in 1897

protests which followed were only satisfied when, just over a year later, the foundation of the BBC took place.

In 1989 there was a rumour throwing doubt on the future of the site due to takeovers involving Plesseys and Siemens. The original site plans and a fully documented history were sent to English Heritage. The reply was, again, 'not of sufficient architectural or historic importance'.

*Frederick Roberts*

*The situation in Chelmsford may be changing for the better. Since this article was written a permanent post has been advertised in the Museums Bulletin (March 1990) for a Chelmsford Industrial Museum Officer, perhaps signalling the determination of the Council to press forward in creating an industrial museum for the town. Plaques were erected by Chelmsford Museum Service at Marconi's New Street Works in 1987 and at the Hoffman Manufacturing Company in 1989.* Editor

## RAISING THE IRON ROOF

The Botfields were one of the leading families of Shropshire ironmasters around the beginning of the eighteenth century. With the break-up of the Darby and Reynolds partnership in the 1790s, the death of William Reynolds and the removal of John Wilkinson from Shropshire, they became pre-eminent in Shropshire iron during the Napoleonic Wars. Unlike their predecessors, they have not generally been associated with innovation in the iron trade and the uses of iron. However a recent discovery illustrates an attempt by one of the family to apply iron to new uses.

Thomas Botfield II was the oldest of the three sons of Thomas Botfield I, who established the family iron business and died in 1801. In 1803 Thomas II bought the manor of Hopton Wafers, on the edge of the Clee Hills in Shropshire. He was at that time overseeing various family enterprises including Clee Hill Colliery and the furnace nearby.

On 26 July 1809 Botfield registered a patent (no. 3246) for 'Iron Roofs for Houses', which came to notice recently during research into the mining and quarrying enterprises around Cleehill. The patent was of immediate interest because in the village of Hopton Wafers there is a house which bears the name 'the Iron House'. Local folk-lore has it that Admiral Robert Woodward, the squire of Hopton Wafers in the late nineteenth century, retired and brought iron from part of a ship he had

commanded and used it to make a roof for the house. The tale seemed so improbable that serious-minded historians had disregarded it.

However, faced with a patent for iron roofs from a local ironmaster, the story of the 'Iron House' seemed worth investigating. In fact, there is still a roof made of iron concealed beneath the conventional tiles. During recent improvements the roof had been re-tiled and the iron roof had been photographed by the occupiers while it was exposed. These photographs show a roof of semi-circular cross section with roughly rounded ends, pierced in the centre for the chimney.

The patent of 1809 describes Botfield's 'invention for An Improved Construction of Iron or Metal Roofs for Houses and Other Buildings'. In particular it details:

*In point of principle, I cause houses or other buildings to be covered with sheets or plates of iron, or any other metal; and I make such roofs or covering by riveting, screwing, or fastening the plates together in any convenient way; and I make the roofs arched, covered or in any other form required that will bear their weight, and I thereby dispense with the use of timber or other bearers (above the wall plates) for their support; and if the walls be level they may do without wall plates.*

The patent drawing shows the methods of joining the plates and the shape of the roof as a semi-circular structure.

Comparing the photographs with the drawings

and description it is immediately clear that three methods of fastening had been used: plates had been riveted together, some had been bolted together using flanges on the outside of the roof, and some using flanges bolted together beneath the roof. There, in plain view, were all the techniques outlined in the patent.

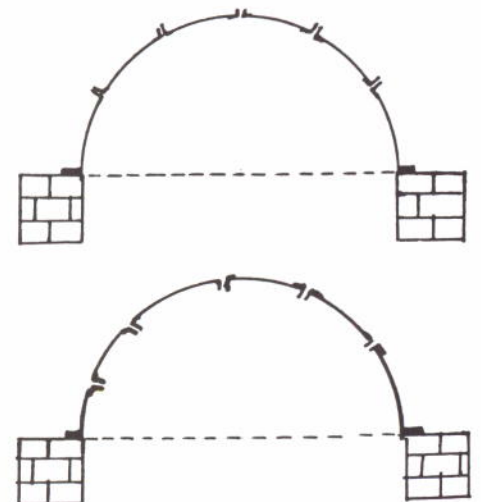
The fact that the roof showed all three methods of fixture leads to the conclusion that this was a prototype in which the techniques had been tried out. The Botfields do not appear to have put the invention to any commercial use, which suggests that the 'Iron House' may be unique. It is very fortunate that the present owners are interested in the history of the roof and determined to preserve it. It could so easily have been removed and scrapped when the re-roofing was in progress.

The house upon which the iron roof was placed is a two up and two down cottage, built of local stone, and is typical of those built in the area in the late eighteenth century (Grid reference SO 637 766). While it is just possible that the Admiral built the roof to the Botfield specification, it would seem unlikely that he would have used three different means of fastening within the one structure. The hidden importance of the building has been reported to the Shropshire Sites and Monuments Record (it is listed as SA 17434).

*Peter Hewitt*



2 Battleship or patent roof? The 'iron house' on Clee Hill



The Botfield patent: the roofs in section, showing alternative fixing methods. Re-drawn by Peter Hewitt

## OBITUARY

### Professor D.G. Tucker, 1914-90

Gordon Tucker died in March at his home in Bromsgrove, aged 75. He was well-known throughout the community of industrial archaeologists and technological historians as one of the most prolific and capable practitioners in either discipline.

Gordon's career was not in industrial archaeology. He was born in 1914 and educated at George Monoux Grammar School, Walthamstow, before joining the Post Office at the age of 17. He gained his first degree and also a PhD and a DSc without ever attending a university full-time. He made important contributions to telephony, inventing the synchrodine radio receiver and developing the FDM carrier systems still used today. In 1950 he moved to the Underwater Detection Establishment in Dorset, where he was engaged in the development of sonar for hunting mines and invented a new kind of within-pulse scanning sonar.

It was in 1955 that Gordon Tucker moved to the University of Birmingham, where he became Professor and Chair of the Department of Electrical Engineering for nearly twenty years. There he established the first university laboratory in sonar, building a research team with an international reputation, and making important research contributions of his own to the use of sonar in the fishing industry.

After his retirement from the Department of Electrical Engineering in 1973 he was able to spend more time on his life-long interests in industrial archaeology and the history of technology, and also his work for the Methodist Church. The dedication with which he threw himself into this work was characteristic of his

energy throughout his life. He published short articles, substantial papers and books with a regularity which surpassed almost any other practitioner in the discipline, past or present. Amongst the multitude were books with his wife Mary Tucker on Pembrokeshire slate quarries and on mills in Radnorshire, and many, many articles: on wind and water mills nationally and in the midlands; on the metallurgical industries of south Wales and the Wye Valley, on the production of millstones, on the history of electrical generation, especially by water power, and on early tramroads. These articles appeared in the journals of organisations with which he was involved, including the Midland Mills Group, the Historical Metallurgy Society, the Railway and Canal Historical Society, the Newcomen Society and the AIA.

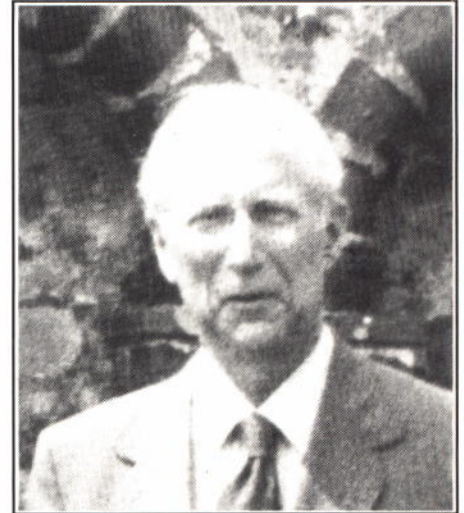
His professionalism was firmly acknowledged by his appointment to a Senior Fellowship in the History of Technology at the University of Birmingham's Department of Economic and Social History, where he supervised research students and contributed from its start to the new postgraduate course in industrial archaeology at the Ironbridge Institute. His high standards were also acknowledged by his appointment in 1979 to the Royal Commission on Ancient Monuments in Wales as the Commissioner responsible for industrial sites and buildings. Yet it was typical of his humility and caution never to think of himself as an 'expert', which he felt to be a sure route to failure in one's quest for the truth.

Although very few could ever emulate Gordon Tucker, his attitudes and standards rubbed off on many younger industrial archaeologists, in whom he always took a great deal of interest.

Many benefited enormously from his almost frighteningly incisive mind. His lasting contribution to the discipline will be as much in terms of the standards that he created for others as of the particular publications he left to posterity. His warmth and vigour will be greatly missed.

The AIA was represented at a memorial celebration for Gordon Tucker at Bromsgrove Methodist Centre on 14 March at which over 200 of his family, friends and colleagues were present. All surely agreed with the perception of the minister that Gordon was very distinguished, profoundly humble, and a fine example of the 'universal man'.

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## INDUSTRIAL HERITAGE AND THE OTHER GORGE

The town of New Mills is situated in an area of spectacular beauty astride the confluence of the rivers Goyt and Sett where they are incised into deep sandstone gorges. It lies on the north-western fringe of the Peak District, about eight miles east of Stockport. Mills and the ruined foundations of mills lie in the bottom of the gorges, attracted to the site at the end of the eighteenth century by the water power potential. Evidence of a varied transport history is provided by turnpike roads, the Peak Forest Canal, two nineteenth-century road bridges over the gorges, and several railways making use of the valley routes. In addition, there were once over thirty small coal mines scattered over the surrounding hillsides working the 'Yard' seam.

In recent years, the New Mills Town Council and Derbyshire County Council have carried out environmental and access improvements to the dramatic gorge known as the Torrs, above which the town perches. This area is now promoted as 'The Torrs: Riverside Park—the park under the town'. The establishment of the Heritage and Information Centre is part of a wider strategy to develop the local potential for tourism and to assemble for the townspeople's benefit the story of their historical setting.

The Centre is conveniently located near Central Railway Station, adjacent to the bus station, and by the side of the path leading down into the Torrs. This path links with the Sett Valley Trail along the old railway to Hayfield, and the Goyt Valley Way, a long-distance route linking the Manchester conurbation with the Goyt valley and the Peak District National Park.

The Centre is housed in a converted stone building of great character and contains a shop selling teas and publications, several permanent displays, a temporary exhibitions room, an environmental studies room (financed by Derbyshire Education Committee), and a viewing platform over the gorge below. The Centre is staffed by a part-time administrator, voluntary assistants, a full-time advisory teacher, and a part-time clerical assistant. In addition, there is a voluntary archivist who accesses carefully historical items donated to the Centre.

The capital cost was approximately £80,000 and was met by grants from New Mills Town Council, Derbyshire County Council, the English Tourist Board, the Countryside Commission, English Heritage, and various local groups and individuals. The running costs are met by New Mills Town Council.

One of the main functions of the Centre is to tell 'The New Mills Story'. This was prepared by a group from the New Mills Local History Society and the displays made by the County Museum Service. One room is devoted to the natural features of the district and the formation of the Torrs, the district at Domesday and the Royal Forest of the Peak, the activities of the rural community, the fascinating story of the 'New Mill' which gave its name to the town, and the growth of communications and coal mining. For young visitors, there is also a reconstructed coal mine tunnel to crawl through.

A second room describes the growth of the cotton mills in the town. In this room is a magnificent model of the town in 1884—the year the Union Road high level bridge over the Torrs was built—with accompanying commentary. A third room describes the once important

engraving and printing industries and the later growth of New Mills as a community. John Potts of New Mills was an engraver of copper rollers for printing designs on textiles and he is known for adapting the 'die and mill' method so that it could be used for the production of engraved metal rollers. A roller from this period, the 1820s, forms part of the display. A fourth room is reserved for temporary exhibitions and is popular for community events. The Centre was opened unofficially in July 1988, and officially by Brian Redhead nine months later. The Centre provides New Mills people with a place to learn about the growth of the town, and one of the most encouraging aspects has been the enthusiasm of local people to donate historic items and photographs which have been lying for years in drawers and lofts. Many of these are incorporated into the displays. Individuals or groups wishing to make use of the Centre or to donate items are asked to contact the Administrator, New Mills Heritage and Information Centre, Rock Mill Lane, New Mills, via Stockport, SK12 3ES ☎ 0663 46904. School parties wishing to use the teaching room should contact the Advisory Teacher by letter or by telephone, mornings only. The Centre is open Tuesdays to Fridays from 11am to 4pm and at weekends from 10.30am to 4.30pm. Admission is free.

Derek Brumhead.