

# SUFFOLK MILLS GROUP

## Newsletter

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Three enjoyable events have been held since the October newsletter. The one and only opening of Herringfleet windpump during 2001 on October 14th saw the sails turning most of the time, and some occasional pumping, although the number of visitors was disappointing. A fortnight later we celebrated Stanton mill's 250th birthday with a superb cake specially made by Caroline Shackle. On view was the impressive work carried out towards what will surely be, in a few years time, one of the country's finest working post mills. The members' evening in early December was quite well attended, and our thanks go to Chris Armour for all his hard work in preparing his engineering workshop. It certainly proved a most interesting venue, with a variety of past and present work to see and admire.

2002 is S.M.G.'s 25th anniversary year. Can it really be that long since our inaugural meeting at Woodbridge tide mill? How time flies! Yet so much has been achieved and, although there have been losses and disappointments, on the whole the Suffolk mill scene is brighter than it was a quarter of a century ago. We hope to publish a suitable feature, looking forwards as well as backwards, in the next issue. If any member would care to write to me with their own thoughts about the past, present and future of our Suffolk mills, I would be delighted to hear from them. Please do try to make the effort, as I'm fast running out of new material for these pages.

The next newsletter will appear in May. Events until then, starting with our forthcoming public meeting, are set out below.

S.M.G. public meeting, Ipswich	Saturday February 23rd
SPAB Spring mills meeting, London	Saturday March 16th
SLHC Societies Day, Mendlesham	Saturday March 23rd
National Mills Weekend	May 11th-12th
SPAB Mills Section day tour	Saturday May 18th
Stanton post mill work-in (1)	June 1st-9th
Stanton post mill work-in (2)	August 3rd-11th

Mark Barnard

## MILLS AND ME (11) Peter Steggall

### SAXTEAD GREEN MILL - 30th JUNE 1967

Most windmills stand, for obvious reasons, in obvious places, but Saxtead Mill is particularly well sited and stands conspicuously visible to the traveller from whichever way he approaches. Many times we had approached across the broad village green and passed on, but this morning with time to spare we decided to visit the mill. The brick roundhouse and all the

timberwork of the mill were dazzlingly white in the sun. As we walked in through the gate we were surprised at the size and height of the mill. Seen across the green in its comparatively open setting its true size is not apparent, but at close quarters and from within the height and mass are very impressive.

The layman is struck by the ingenuity of the design, both of the building and its parts, and by the skill that must have gone into its construction. The whole mill was thoroughly overhauled between 1957 and 1960, and a great deal of contemporary skill and craftsmanship went into the restoration and repair of the older craftsmen's work.

Perhaps the best way to understand the working of the mill is firstly to study all the details of the outside and inside construction and parts, and afterwards to read the excellent leaflet (with cutaway drawing) written by the leading expert on mills, Rex Wailes, for the Ministry of Public Buildings and Works who are responsible for the mill. I found, from my own inspection before reading the leaflet, that I could understand the working of the fantail, the sails and the millstones, so wonderfully designed and exposed are all the moving parts, both outside and inside. But to read Rex Wailes afterwards is to be truly enlightened on all the details, down to the little alarm bell which rings when the grain hoppers are nearly empty.

Inside the mill, on all the floors of the roundhouse and the buck, all the structure and the working parts are so well designed and so functionally constructed that it is possible to see and to understand - even without special knowledge - just how the mill was built and operated.

The outside is more than purely functional - it is a thing of great beauty in its overall proportions and in its finely executed details. The slightly bowed front, to ensure clearance by the great, sweeping sails; the way the timber cladding of the buck is shaped to fit over the conical roof of the roundhouse; the impressive width and strength of the steps leading up beneath



Saxtead Green Mill and mill house

the fantail and forming part of the fantail structure itself; and at the top of the same steps the weatherboarded hood over the doorway, reflecting in miniature the inverted boat shape of the top of the mill.

Inside, again, the huge post, about 2ft square of solid oak, takes the weight of the buck and rests on cross-beams with their ends on four brick piers, formerly exposed, but now enclosed in the roundhouse. The base of the post and the cross-beams can be seen in the top floor of the roundhouse, and have a primitive strength and simplicity by contrast with the subtleties and complications of the machinery in the top of the buck. In a sense, the whole spirit and detail change from strength and simplicity at the base to a smaller and ingenious scale at the top, culminating in the 'spider' and its legs controlling the vanes on the sails. But make no mistake, the beams and windshaft and the cogs in the very top of the mill, just under the boat-shaped roof, are no light-weights. As in a belfry there is something very awe-inspiring about the mechanism and the great supporting beams so high above the ground in a building which acts as a landmark over many acres of countryside.

From the windows on each floor, one has a fine view of that same countryside, and, just below, of the model windmills, including a very good replica of this one, standing on the lawn of the mill house.

Down to earth again, one can study the cunning mechanism of rods and cogs of the fantail which operate the wheels around the circular track, thus keeping the mill sails facing into the wind. Around the outer edge of this circular track is a band of copper, not mentioned in Rex Wailes' account. But if you bend down and look under the lowest step you will see a metal shoe like the conductor on an electric tram or train, resting on the copper band. Looking even more closely, you will see that the shoe is connected with the lightning conductor running up (or should one say 'down'?) the sides of the steps and body of the mill.

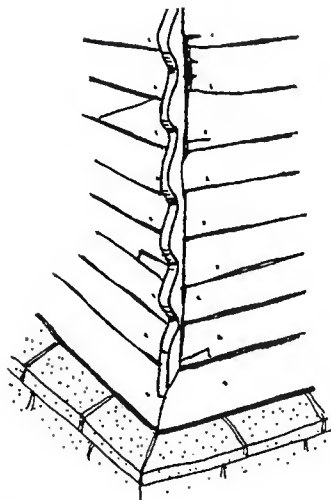
Although the mill has ceased to grind corn, it is in full working order and the sails are sometimes turned. I have seen them spinning round - a startling sight at first glimpse across the fields, but how impressive and even frightening to be inside the mill and to hear and feel the vibration of the great sails and the shafts and wheels under the cap!

## LETTER TO THE EDITOR

Don Porter of 4 Enstone Road, Charlbury OX7 3QR writes:

*I read your S.M.G. journals with great interest though I now get to Suffolk only rarely. But I remember the fun we had at Bardwell (that Fastnet gale!) and Thelnetham.*

*It always seems to me that with the post mills there is a design problem, namely how to make the corners weatherproof. Lots of paint and sticky stuff, but you can't get a really sound joint. I came across a magazine article that had me wondering whether there is a better way. All Saints, Brockhampton was built*



The corner detail at  
All Saints Church,  
Brockhampton

*in 1902 and is famous as an example of a church designed by Lethaby on the principles of the Arts and Crafts Movement. The whole job is fascinating and the restoration threw up a lot of problems and the article describes some of them.*

*The bit I thought might be of interest is where the boards (oak in this case) are fitted up to a member on the frame that is at 45°. Each board can then be fitted accurately with end grain up against a flat face. Does this method appear in mills? It could make the buck more durable. Is this a modification worth trying out? And would the purists allow it? In the church the 45° member is shaped in a typical Art/Craft way but it could be just straight.*

## **BURES MILL THROUGH NINE CENTURIES (2)**

Witgar Hitchcock

### Further Progress in the 19th Century

As the 18th century closed, milling enjoyed thirty years of prosperity, right up to 1815. The price of wheat reached 126/- a Quarter in 1810, a price not seen again till 1946. So the manor had a good war, as the saying goes, and thus it came about that both the mill and the house were enlarged in 1820. The house was extended to its present size, the frontage being increased by 50%, the addition being one third of the whole, but 9ins brickwork was used instead of 14ins. Five windows were in place on the first floor, but those at either end were faked in order to save window tax. This lasted till 1851, but the two windows were not glazed until 1949 on the new end and 1996 on the opposite end.

The extension of the mill was in the form of a four storey building with slate roof facing the garden and at right angles to the 18th century section. The extra 2500 square feet of floorspace must have been intended for goods unloaded from barges which came under the lucam jutting over the leat, since there was no power available for machinery. The building was extremely well constructed with massive main beams of Norwegian pine with local oak corner pieces between the beams and the adjacent posts. The Norwegian timber came up the river by barge.

It is not known who bought the lease auctioned in 1785 but in the 1820's, Ezra Dalton of the Bures family of malsters and farmers had the mill and its eight acres of meadow land. By then, milling was again in unprofitable times, so the rental was reduced to £250 per annum. The four pairs of stones, of which only three would be running at one time, had a capacity for grinding 34 tons per week.

In January 1829, the mill was leased for 14 years to Jeremiah and William Stannard. Robert Stannard followed in 1844 and was joined by William in 1858, by which time they also had Wiston Mill. In the census of 1851, Robert, aged 32, was living in the mill house with his wife and three young children, their governess and two domestic servants. Ten men were employed including two journeymen, who lived in the late Georgian Clicket House, now 1 and 2 Mill Cottages, Nayland Road, that had been bought by William Stannard senior.

By this time, the industrial revolution was having its impact on the milling industry, first of all by the introduction of steam power. Most manors could not see their way to finance and maintain such costly machinery and hence sold off their manorial mills. Bures Mill was no exception and in 1867 it was bought by Mr John Cooper for £1800, who immediately installed a steam engine at the back of the mill. It augmented the power of the waterwheel, allowing additional machinery to be operated concurrently with the existing. However, after only seven years, he sold the premises for £1950 to Cornelius Hitchcock, then only 23 years old. Cornelius had been born at Woodhall, Rattlesden, and was the first in the direct male line, after five generations of yeoman farmers, to foresake farming for milling.

Cornelius had served an apprenticeship at Buxhall windmill with Isaac Clover, the husband of his father's first cousin. The deed made out for the apprenticeship in February 1868 forbade Cornelius from haunting taverns or playhouses, committing fornication or contracting matrimony and at playing at cards or dice tables or any other unlawful games. The apprenticeship commenced on October 11th, the old Michaelmas Day, still adhered to in Suffolk. At the end of the four years, Cornelius went as an improver to Sudbury watermill, owned by Isaac Clover, his second cousin. It was he who got Cornelius a lease of Lawford Mill for two years from August 1873. Having proved himself there, Cornelius bought Bures Mill in August 1875 with the aid of a loan from Isaac junior. A year earlier, Cornelius married Esther Fanny Cooper of Drinkstone.

Cornelius must have prospered at Bures during the years of agricultural depression up to 1879, for, in that year, he bought Warmingford Mill. His greatest achievement followed in 1893, when he changed over from stones to roller flour milling at Bures Mill. Instead of producing wholemeal flour on stones, the new Hungarian system of roller flour milling gave the white flour so eagerly demanded by the public. The mill was entirely remodelled with four pairs of break rolls and three pairs of reduction rolls sited on the first floor of the 1820 wing together with purifiers on the floor above and centrifugals on the top floor. In addition, there was a washing plant and conditioner placed at the furthest end of the 16th century mill. The plant was supplied by Davies & Sneade of Liverpool and was installed by Barton & Co. of Sudbury. It had a rated output of four sacks, or half a ton, of flour an hour, indicating a weekly usage of 50 tons of wheat. *The Miller* of August 7th 1893 recorded the trial run made on July 28th. Soon afterwards, the mill was provided with electric light throughout and a few years later, the steam engine was replaced with an 80 hp suction gas engine.



Bures Mill c.1900. The 1820 extension is on the left.

Of the 30 mills on the Stour and its tributaries, only three others, namely Sudbury, Cornard and Dedham, made the switch to roller flour milling. Dedham, the last of these to mill flour, closed down in 1982, but Cornard and Bures continued with the manufacture of animal feed.

#### River Levels

As waterwheels became redundant, all that valiant effort which went into the excavation of the leat from its beginnings in the twelfth century with its subsequent widening and the raising of the banks in the course of the following three centuries, was lost. The Celts had called the river *Swift* and from that the current name is derived. Floodgates and staunches reduced the strongly flowing Stour to a steady stream. At Bures Mill, the maximum height of the headwater with the raised banks of the leat, was 64ft. The Millers' Level, representing the height to which the river could be raised, under normal weather conditions, was 61ft 11ins. A surveyor's mark on the brickwork just upstream of the floodgates, which is now buried, provided the legality. The exact level chosen at each mill represented a compromise between the millers, who wanted maximum fall, and the riparian meadow owners, whose land would be ruined by constant saturation. The chosen level at each mill ensured that these meadows might well be saturated all the winter, but would be sufficiently dry during the summer months to permit grazing. In very dry summers, the level of the water at the head above each mill could well have been beneficially augmented by what drained out of the meadow lands.

These levels had great antiquity and were enforced through the manorial courts, as at Bures in 1500 and 1512. Responsibility

for maintaining the optimum level at each mill was delegated to an experienced employee, who might well receive a bonus of 15% of his wages for so doing. William Aldous, who died in the late 1930's, was the last man at Bures to hold this office. When rainfall caused the water to rise, he first removed the flashes, and then, as necessary, took his hefty six inch spanner to turn the cogwheels of the five gates, raising them by an appropriate amount. As a perk, he could take half the eels netted at the floodgates during dark nights with rising waters in the late summer and early autumn.

The use of the river as a source of power constituted the *Miller's Rights*. These became of no consequence once the waterwheel was removed as at Bures Mill in 1932. So the floodgates were no longer worth repairing in the depressed 1930's. It was therefore no surprise when they fell in during the winter of 1936-7. As there was no obligation on the miller's part to repair them, the newly formed River Stour Catchment Board, set up on the demise of the Stour Navigation Co., took over the responsibility for conserving the proper level of the river upstream of the mill. To this end, the Board placed a concrete wall across the gap where the floodgates had been and a brick wall at the edge of the apron facing the floodgate hole, with infill between. In the following autumn, the Board removed the disused lock and its gates and installed an automatically operating sluice gate made by Ransome & Rapier of Ipswich. The gate was set to maintain a headwater of 59ft 5ins over sea level. The reduction of 2ft 6ins allowed a corresponding fall in the water table of riparian land upstream, permitting cultivation of arable crops. The new level still allowed for the leat to carry a full breadth of water up to the mill, and so proceed to the little arch opening to the tailwater.

Not content with the lowering of the level in 1938, the succeeding Essex River Authority made a further reduction of 1ft 5ins in 1968. On this occasion, the river upstream of the sluice was dredged to give the required depth to suit the lower level. In so doing, it was noted that the river became changed dramatically at the junction of the leat with the original river. In addition, the original defect in the sluice gate's automatic mechanism was corrected. There were two pipes, one on each side of the channel above the gate, through which water passed causing the mechanism to respond to changes in water level, resulting in corresponding raising or lowering of the gate. As the water level in the channel above the gate fell from the top end of the channel to the gate, so it did not reflect correctly the height of the river. By changing the intake of one of these pipes to a point on the bank upstream of the sluice channel, the mechanism then reacted to the true height of the river for the first time. As a result, the gate rose above the level of the water at the highest floods, which it had never previously done. More water came through at a faster rate than ever before, resulting in considerable erosion of the bank opposite to the outflow. This brought into effect a clause in the 1938 Agreement between the Catchment Board and the mill owners, whereby any such damage should be made good at the Board's expense. Considerable reparations were made and these have stood the test of time.

Typically of the Board, the lowering of the level of the river upstream of the sluice gate was carried out before the river downstream was dredged. At that moment the very high flood of mid September 1968 was extenuated at the top end of the lower level, in particular in respect of the mill property. The mill house was flooded as never before back to 1800, in spite of being on the highest ground. The accumulation of weed in the river all the way to Nayland substantially contributed to the depth of water in and around the house and mill. After that, the River Board filled in the leat from the mill to a position in line with the sluice gate, primarily to avoid the stretch becoming a marsh on the lowering of the level of river beyond that point. The opportunity was taken to build up the level of this infill to a height of 64 feet above sea level, so causing overflow in the highest floods to take place upstream of the sluice as far as the entry of the Cambridge Brook, i.e. across the main part of the wooping, rather than right close to the mill.

With that section of the leat filled in, the Board sunk an 18ins conduit to take water from the open leat near the sluice gate, along the side of the filled in part of the leat and the 1820 wing of the mill to a point between the house and the mill. There it was connected by a pipe at right angles to join it to the channel which flowed through to the by then embedded little arch and so into the conduit erected in 1963 in the infilled tailwater. This enabled the tailwater dividing the garden from the meadow to be retained with running water.

#### Twentieth Century changes at the Mill

Manfred, the second son of Cornelius and Esther, proceeded to work for his father from 1904 and became a director of the Limited Company which took over the business in April 1915, four years after he had obtained second class honours in the London City and Guilds examinations in Milling (flour manufacture). The move to limited liability was a novel procedure for such a small business at that time, but was clearly most advantageous. Unfortunately, the business of flour milling had a chequered time thereafter, on account of the Ministry of Food's complete control of flour milling during the later years of the Great War and after, together with the following slump in agriculture and its products from 1922 onwards. In spite of increasing the output of the mill to five sacks per hour and running extended hours, profits became losses and it was decided to sell the right to make flour to the British and Irish Millers Mutual Association for a period of ten years from 1929 for £2750.

The compensation allowed for the manufacture of Sussex Ground Oats to be established at Bures, following the 1929 demolition by fire of Wormingford Mill, where Sussex Ground Oats had been manufactured since 1902, the first mill north of the Thames to do so. Barron dreadnoughts with vertically placed stones were situated on the roller floor at Bures Mill and the centrifugals left over from flour milling came in for grading the product from the stones. As these dreadnoughts took more power than the roller mills, only two were installed at first, but the number was doubled in 1932 when a 220 hp Robey diesel engine was installed where the waterwheel had been. Nevertheless, within a year, the



Robey and the Sussex Grounds Oats plant was transferred to Fingringhoe Mill to take advantage of waterside transport for grain, in this case, Canadian oats, direct to the mill, following transshipment in the Pool of London.

Bures Mill was then bereft of almost all its machinery. It soon became a producer of compound animal feeds, at first just pig meals and layers mash. In 1936, a small Sizer cuber was installed, enabling dairy cubes to become the main product for the following ten years. In 1948, mains electricity came to the mill and a larger cuber was obtained. There then began the production of an ever lengthening range of compound feeds for all classes of livestock, numbering 64 by 1989. To this end, the mill buildings were enlarged on three occasions, 1957, 1963 and 1980. On the last of these occasions, a second cubing line was installed and by this time the machinery had become considerably advanced and up to date.

However, with the great changes in agriculture culminating in the almost total demise of mixed farming and of the strongly associated trade of the corn merchants that supplied such farms, production fell sharply between 1984 and 1989, with the result that the Company's business was sold to Clark & Butcher of Soham with effect from February 5th 1990. While the buyers kept Fingringhoe Mill going for three years, they only purchased the stock and business of Bures Mill, with the result that the whole of the Bures property had to be sold separately. This sale was completed with the present owners, Drs. Temple, on May 31st 1994. They used the permission already obtained for the demolition of all the buildings attached to the Grade II timber mill. This was carried out in the following two years, leaving just the 18th century and 1820 buildings plus the remaining sliver of the Tudor mill, the only parts not erected by three generations of Hitchcocks in the course of 115 years.



Bures Mill and Mill House today. The abutment of the Tudor mill can be clearly seen. (Sketch by Penny Berry)

## WEBSITE REVIEW Steven King

This is the first instalment of an occasional series documenting windmill and watermill sites on the Internet. I will be reviewing two mills at a time, so as not to exhaust all the sites at once.

Fulbourn Windmill <http://www.fulbourn.windmill.btinternet.co.uk>

Well set-out pages with a lot of information on the mill's history, notable dates in the mill's life, and millers who worked her. There is a gallery of photographs of the mill through the ages, from her working days to her dereliction. There is a comprehensive account of the restoration work that has been done so far, and a list of dates when there are work-ins on the mill. One notable feature on the site is the on-line newsletter. There is also a guest book for visitors to sign.

Marks: 9/10

Green's Mill, Nottingham <http://www.innotts.co.uk/greensmill>

A compact home page, with a nice picture of the mill. A selection of links is displayed down the left side of the navigation bar. There is also a section on George Green himself, which is interesting. The mill's history is in-depth, from accounts of construction through to dereliction to the restoration. A lot of information is in the pages, but I feel the lack of illustrations to help people who have had little contact with mills may baulk them a little. This is a small, but in my mind vital flaw in a pretty decent site. Despite this, I think it is a good site, but not one for people who are not familiar with mills.

Marks: 7/10

## NEWS

### ROGER SKINNER 1938-2002

I am sorry to have to report that Roger Skinner died on 22nd January, after a long illness.

Roger will be greatly missed. He first became actively involved with windmills in the early 1980's, during the S.M.G. work-ins at Thelnetham. Initially this was through his daughter Michelle's great interest in mills, but he soon became a mill enthusiast in his own right, regularly appearing at the Thelnetham work-ins.

Following the completion of Thelnetham, Roger took an active part in the project to restore Wicken windmill. He was to be found at Wicken during main and weekend work-ins up to early 2001, when his illness began inexorably to take hold. Even so he was still able to find the strength to come to the mill sometimes, and the last occasion he could come to site was during the afternoon of October 7th. The mill had ground its first flour by wind in many years that morning. It was duly started up again, and we were greatly pleased that he could see flour being produced in a fair breeze with the sail shutters half open.

Roger was an architectural draughtsman, and could always be called on to produce site plans and building elevations, however busy he was. He also did metalwork classes, and a succession of engineering components were made for the mills. For example, the striking onion at Wicken was made by Roger.

Apart from everything else Roger was a very encouraging person. Millwrighting is an immensely satisfying but very demanding activity, and when difficulties seem profound a few words of encouragement and support are a great thing. I will not forget the help and support that Roger gave us.

Roger and Dawn lived for 37 years at Tongham in Surrey, just below the Hogs Back. Our sympathy goes to Dawn, to Michelle and to Michelle's husband Frank. (Dave Pearce)

*Dawn has asked that any donations in memory of Roger be made to the Wicken Windmill funds. (Please make out cheques to 'Wicken Windmill'; contacts: Dave Pearce, 14 Church Lane, Long Clawson, Leicestershire LE14 4ND, or Michelle Roper)*

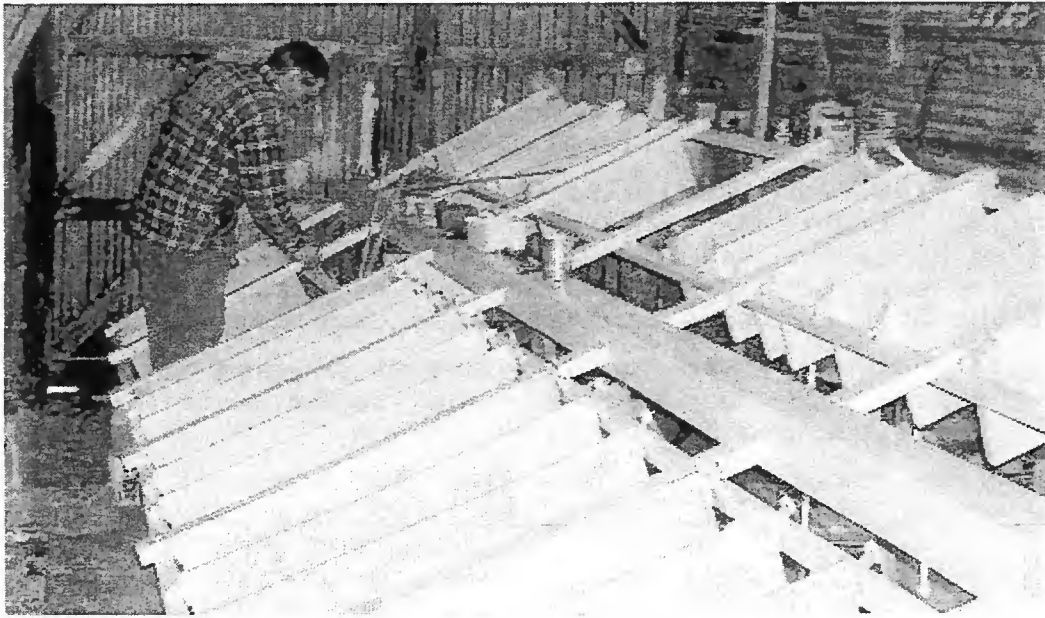
#### STANTON WINDMILL NEWS

About two dozen members and friends turned out for the 250th birthday party on October 28th. A good spread had been provided, topped by the magnificent cake made by Caroline Shackle, and it was a shame to cut into this, but we did! The weather was very fine and sunny, but with no wind, so the new sails could only be admired in their static state. We did push them round a few times, though.

Work to the windmill continues meanwhile. The roof was finished by the addition of rope guides to the ridge, and the



Stanton mill's 250th birthday cake



paint has been completed. The scaffolding has now been removed and the holes in the boards covered by little hatches, so the mill once again has a clean profile. The two sail frames have now been completed and one is in the workshop having the shutters and boards fitted (see photo above). About 50 new shutters have been made, and worn cranks or pivots have been renewed on the remainder. The items that have taken the most effort have been the repair of one of the clamps, and of the stock. The clamp, of oak, was in quite bad condition when the paint was removed, with several patches of rot and even some woodworm. It had a lot of sapwood in it and this only goes to prove the wisdom of avoiding sapwood in an exposed situation such as mill sails. Sufficient good wood survived to allow patching, using modern adhesives, and by the end of this process there were no fewer than 11 patches on it. Once painted however this all disappears and both clamps are now ready to go back.

The stock took more than a month to repair. This also had some rot and woodworm. The rot was cut out and patches glued in using a specially formulated resin repair system (actually aimed at window repairs), with dry preservative plugs inserted at intervals to ward off further decay. The worst decay was in the poll end, needless to say, but was mostly confined to one of the planks glued on the side. I should explain that the stock, made in 1987 by the previous restorers, is made from a secondhand piece of pitchpine from a demolished warehouse, brought up to full cross section by gluing two planks along each side. Unfortunately these were not long enough, so about halfway out there was a sudden reduction in cross section, at the point where the stress was quite high. To partly overcome this defect we have glued on further pieces to soften the reduction in section and provide a further two feet or so of stiffening to the stock. Another defect in the construction was that the stock was 'S'-shaped in one plane, and one end drooped in the other plane. I have done what I can to straighten it up, and have taken surplus material off each face to slim it down. The many minor defects

and shakes in the timber have been filled with the 'Window Care' resin, and as I write this I have just applied the first coat of paint, so I'm pleased that this job is nearing an end. The amount of work in saving the stock and clamp is huge, nearly as much as to make new ones, but of course the cost of a new stock, in particular, would be very high. The resin is very impressive. A Dutch product, it is an epoxy resin modified with flexible filler, so that when set, it retains some flexibility, and can be worked just like wood, with planes, chisels and saws. The one big drawback is its cost, plus there are some in the conservation field that won't tolerate any resin at all. I think it is very well suited to windmill repair however, as it will allow original timbers that may have broken or decayed to be retained and brought back to full structural strength.

Work-in dates are now decided; the main ones will be June 1st-9th and August 3rd-11th. In addition I will be working on the mill the week before Easter, from Sunday March 24th, probably until the following Easter Monday (April 1st). If things go well we may put the sails up towards the end of the week. The main jobs planned for June are to complete the 'Phase One' works, namely the brickwork, stone tun and spout. It would be good to have the mill grinding for the Queen's Jubilee!

Plans are already advanced for the first part of 'Phase Two', which will be the repair and reboarding of the left side of the buck, although as this requires Scheduled Monument Consent I will be at the mercy of English Heritage once again. If possible I want to start on this work in August. (Peter Dolman)

#### WICKEN WINDMILL GRINDS AGAIN

Wicken windmill is now in working order: the first pair of millstones was commissioned on October 7th 2001. It is the only preserved English smock windmill capable of producing flour by wind north of the Thames. (To my mind the working smocks south of the Thames are: Cranbrook, Sarre, Shipley and Draper's Mill, Margate.) The first grind of flour was fine but gritty: we'd done a lot of stone dressing to say the least. The remaining restoration work is principally the completion of repairs to the internal machinery.

The mill sails are wide, at 9ft, and the twist of each sail changes uniformly from 15° at the tip to 26° at the heel to optimise their power. This sail twist was measured on an old whip stored at Thelnetham, and was used in the restoration there. Chris Wilson concluded that the same twist was used at Over mill, and old photographs, not least of Wicken itself, suggested that similar angles were common in this part of East Anglia. The full complement of 208 shutters was completed in 2001. The only remaining sail components to be fitted are the wind boards near the hub. These are made, and will be fitted after the winter storms. The sails have recently been balanced by fitting a specially cast 20lb lead weight to Sail IV.

Major repair works to the wallower and the eastern pair of stones were completed during 2001. Final restoration of the sack hoist is under way.

The wallower at Wicken is one of the largest fitted in a British mill, at 5ft 2ins diameter (over the lower rim). It is entirely of timber, apart from fixings. Large wallowers were an idiosyncratic feature of Cambridgeshire millwrighting practice: they were probably a carry-over from the design of large Fenland pumping windmills, none of which now survive in the U.K.

The original wallower had partly been lost through rot, following the progressive failure of the cap roof from the 1950's onwards. The components of the original wheel have been saved, and a new wheel built following the original scheme. This is a true bevel gear, whose construction in timber is particularly demanding. The 63 beech cogs are mortised into the elm rim, each mortise tapering in both the vertical and horizontal planes. Each cog has a retaining pin, a fail-safe feature in case the cog should work loose during operation. The cogs were shaped in situ. The cog centres were pitched out in the traditional way, by stepping a pair of large dividers around the pitch circle and adjusting repeatedly until such time that after stepping 63 cog pitches round the wheel the dividers returned to the starting point. Of course being a bevel gear, the cogs taper from top to bottom, requiring different involute templates for the shapes of the two ends of the cog.

After a tremendous number of hours of painstaking work the wallower and brakewheels were complete and meshed together. From the first the operation of the two wheels under wind power has been very smooth: small adjustments have been made to the meshing of the wheels to achieve best running conditions.



Wicken Windmill, Summer 2001

The wooden stone furniture of the western stones has been renewed according to the original pattern, the original being in poor condition and inadequate for use in contact with foodstuffs. The stones had been run hard and long without dressing, making it necessary to dress them flat and deepen or re-cut the furrows, some of which had been completely worn away.

The structural repairs to the windmill are now essentially complete, and the main external and internal machinery is operational. The team has a number of works in hand, essentially aimed at completing the repair of the internal machinery. This will allow the visitor to

experience the atmosphere of a working flour mill if visited around 1900.

A system of layshafts and pulleys to take the drive from the great spurwheel down to auxillary machinery such as the flour dresser was characteristic of smock and tower mills in Cambridgeshire. At Wickem it is clear how the auxillary drive was set up. The gear ring which drove it is still present on the underside of the spurwheel and remains of bearings, cut-outs in the brickwork of the tower base and marks on floor joists all clarify the arrangement, which is thought to have been scrapped in the late 1930's or 1940's.

A large wooden pulley, based on the large sack hoist drive pulley at Thelnetham mill, has been built for the auxillary drive. Hangers for the auxillary drive have been made and fitted, and plumber block bearings obtained and set in place. A composite wooden layshaft with steel gudgeons is under construction.

The original wind driven flour dresser was also scrapped many years ago. A new one has been designed, according to the traditional pattern, and taking account of the limited height available on the ground floor. The dresser is now under construction. The timber frame is being jointed together, the steel mesh for the main sieving screens has been bought, and the wheels to carry the sieves have been cast.

The 4ft 6ins runner of the eastern millstones was in a poor state: old attempts to balance the stone, presumably by the miller, had led to the plaster of Paris upper section of the stone being cracked radially. Other damage, probably by frost, had caused the plaster to crack away from the burrs. Further, the 6ins high iron retaining band around the rim had failed through rust. The cracked plaster of Paris has been removed from this millstone. The underlying burr stone assembly has been found to be sound, and the stone will be rebuilt on this foundation.

Apart from the new work described above, there is painting and tarring, and work on the outbuildings, significant parts of which survive from milling days. Our main work-ins this year are: **May 4th-12th** and **August 17th-26th**. The volunteer help we have received over the years is greatly valued. If you would like to help this year contact Dave Pearce (01664 822751) or e-mail [Dave@pearce52.freeseerve.co.uk](mailto:Dave@pearce52.freeseerve.co.uk) (D.P.)

#### A MOST GENEROUS BEQUEST

Last summer we were most pleasantly surprised to be contacted by the executors of John Allen, a retired gardener of Bury St Edmunds, who had died at the age of 98 in July 2000. He had come to know of us during the mid 1980's when we were in the closing stages of the Thelnetham restoration and were just starting on the works at Stanton. In his will he left us a 12th part of his estate, a quite sizeable amount. The committee has decided to put this into our savings account for the time being and will use it as working capital for the production of two books. In this way the money will be put to work and should eventually return for further use. We have also taken the opportunity to replace some of our ageing power tools. (P.D.)

## BARDWELL WINDMILL RESTORATION PROGRESS

Work on the rebuilding of the cap of Bardwell mill, which was halted for much of last year owing to the illness of millwright Richard Seago, recommenced in the autumn at the Oxfordshire workshops of IJP Building Conservation Ltd.

As reported in Newsletter 77, both sheers have had to be renewed (in oak) as the 1980's pine sheers had suffered deterioration at their rear ends. The timbers supporting the fantail had been similarly affected. Progress by IJP to date has included erection of a new fantail cradle, completion of the fantail blades and installation of the windshaft, brakewheel and cap roof. An interesting feature of the assembly is the double cap circle which provides solid anchorage for the petticoat. The beehive-shaped cap roof is 16-sided and clad in horizontal weatherboards, with aluminium soakers protecting the joints. It remains sound although new lower ends for some of the spars will be required. A new Swedish oil-based paint system is being used on this project and initial results are encouraging.

IJP aims to achieve as authentic and comprehensive a restoration as is possible. In this regard, the scope of the project has widened and work is now under way to repair the upper part of the tower, where certain structural weaknesses have compounded in the years since the first restoration was completed. The damaged cast iron curb track gave sufficient cause for concern for it to be entirely re-cast.

The project is being managed by Kieron Bolster who has prepared detailed plans of the work in consultation with S.M.G. A website devoted to the project has been set up which will contain regular progress reports. A 1700-word report gives details of the mill's history, structure, machinery and recent repair work, drawing heavily on material previously published in this newsletter. Certain details caught my attention in particular. The fine inverted date '1823' on the discarded sprattle beam is mentioned, as are the items of machinery which were removed c.1977 for use in the restoration of Great Bircham tower mill in Norfolk, where they remain. These included the flour dresser or 'bolter' (one of the last to remain in a Suffolk windmill), the tenting gear with its centrifugal governors, a pair of millstones, their drive gearing and both of the octagonal stone tuns. It would be encouraging to think that the missing parts could be returned to Bardwell or exact replicas made. Whether this will be achievable is as yet unknown, however. The Bardwell web page can be accessed via [www.oldhousestore.co.uk](http://www.oldhousestore.co.uk) which itself is worth browsing for details of the company's wide-ranging work on building conservation. (Luke Bonwick)

## WORLD'S LARGEST WIND TURBINE FOR LOWESTOFT?

In October a planning application was made for a 3.2MW variable speed wind turbine on industrial land at Ness Point in Lowestoft. The tower would be 100m high, with a three-bladed rotor 104m in diameter. At almost twice the rated capacity of the turbine at Swaffham, it would be easily the largest in the U.K.. Worldwide, only current projects in Spain and Germany are of comparable size. The applicant, SLP Engineering, will use the experience of





on. The dust floor has been entirely reconstructed, re-using some oak joists, together with much of the floor below. All new structural floor timbers are of larch.

Advice is being sought on straightening the tower, built in 1860 on the foundations of a smock mill. It has moved further in recent years and the lean is now pronounced. Cracks in the brickwork are being monitored to see if this subsidence is continuing. Until this major problem has been addressed, the new curb will sit on blocks and will not be finally levelled. (M.B.)

#### PAKENHAM WATERMILL NEWS

Restoration work to the stone floor, which was never properly completed when the mill was first restored in the late 1970's, has now been finished. A new hatch in the floor allows a view down to the waterwheel. A second pair of stones has been set up to work, with a bedstone in the position of the third pair. The work was carried out by Thompsons of Alford. There is also progress on the Mill House visitor centre project, with an application being made to the Heritage Lottery Fund. (M.B.)

## **EVENTS**

#### S.M.G. PUBLIC MEETING: 'THE CONTRIBUTION OF THE WINDMILL TO THE INDUSTRIAL REVOLUTION'; SATURDAY FEBRUARY 23rd at 7.30pm, at IPSWICH TOWN HALL

This year we are privileged to welcome as speaker Roy Gregory, who gave the 2001 Rex Wailes memorial lecture on this subject last November. A Yorkshireman, Roy became interested in windmills in the 1970's through his management of Skidby mill. His *East Yorkshire Windmills* was published in 1985, and in 1992 he completed a M.Phil. on the work of millwrights Norman & Smithson, who made a significant contribution to the industrialisation of Hull. The talk will cover uses of wind power other than corn milling and drainage. Roy is an excellent speaker, and he deserves a full house. *Please come along to make sure he gets one!* As usual a poster is enclosed if you live locally.

#### SUFFOLK LOCAL HISTORY COUNCIL SOCIETIES DAY: SATURDAY MARCH 23rd at MENDLESHAM VILLAGE HALL

S.M.G. will have a stand at this event, and Chris Hullcoop will give a short talk on our work. Such gatherings can provide useful contacts, especially in the field of mill history.

#### NATIONAL MILLS WEEKEND: MAY 11th-12th

Last year's National Mills Weekend was badly affected by the Foot & Mouth epidemic. We will try to publicise those mills specially open over the weekend, including Herringfleet on the Sunday. Let us know if your local mill is participating!

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