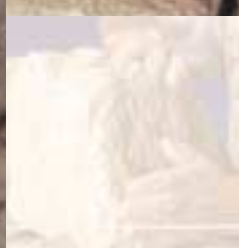


Milling and Millwrighting

Martin Watts



Further information relating to appendices, graphs, statistical data and questionnaires can be found on the website: www.craftsintheenglishcountryside.org.uk

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Milling and Millwrighting

Traditional milling, using machinery driven by water and wind power, may be considered to be comparatively well represented in England, with more than 330 watermills and windmills at present available to the visiting public.¹

The majority of these are in good repair, and a significant number have been restored to working order. These mills, which are analysed and discussed in more detail below, are served by a relatively small number of skilled people, in terms of the millers and technicians who run the machinery, and the millwrights who maintain, repair and rebuild them. The purposes of this chapter are to examine public and professional interest in traditional milling, to analyse the number of mills available to the public and whether this number is declining or increasing, to comment on the conservation and recording of mills, to look at the demand for skilled millers and millwrights and their training and education and, finally, to consider the funding that is available for the conservation and restoration of mills.



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Nutley Windmill, High Weald, East Sussex



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Using mill bill to dress millstone, Hampshire

Public and Professional Interest in Traditional Mills and Milling

The flour milling industry underwent a period of great technological change during the last quarter of the nineteenth century, when a complex system of reducing cereal grains using iron rollers (gradual reduction) superseded the traditional method of breaking open grains by grinding them between two stones which had been developed over nearly ten millennia.²

By the end of the nineteenth century, many traditional millstone mills were unable to compete with the new roller mills. Not only was there considerable natural wastage, as millers died or stopped working, and their knowledge and practical experience of making flour with millstones – rather than simply producing meal or animal feedstuffs – was lost. But in addition, the costs involved in maintaining economically marginal buildings and machinery, which were particularly subject to decay and storm damage, became increasingly burdensome.

In 1887 the National Association of British and Irish Millers (NABIM), which had been founded in 1878, conducted a census which recorded a total of 8,814 flour mills in the United Kingdom, of which a little more than 5% were classified as 'complete roller process mills'.³ In 1907 the first Census of Production received only 1,254 returns from milling establishments, a number that was said to have included even 'the smallest country mill'. While this figure may be slightly on the low side, it still indicates a rapid decline in the number of working mills. It is also considered that, by that time, at least 75% of the flour consumed in Britain was produced by the roller milling process.⁴ Over the same period there was also a significant change in the focus of the milling industry, which was widely dispersed before 1875 but rapidly became concentrated at major inland and coastal ports as roller milling technology began to dominate.

In the last quarter of the nineteenth century and the first decades of the twentieth, there was a certain amount of reaction to the scientifically controlled and refined products of roller milling. In 1880, the short-lived Bread Reform League was formed by the Ladies' Sanitary Association, to promote the nourishing and sustaining wholemeal loaf rather than the popular white loaf.⁵ There was also opposition to the flour produced by roller mills from the medical profession. Dr Thomas Allinson, for example, a Victorian pioneer of medicine and nutrition,



Setting the sails. Stevington windmill, Bedfordshire (1951)

advocated the benefits of stone-ground wholemeal.

In 1892 he bought a stone-grinding mill at Bethnal Green and subsequently started his own bakery.⁶ Wholemeal and baking products bearing Allinson's name are still available today. In 1911, an article in the national press referred to a 'pure bread campaign ... creating a universal call for the old-time dusky loaf' and suggested that 'the old wind- and water-mills, which have had little or nothing to do for years past, are humming with work again in all parts of the country'.⁷ In the same article Sir Oswald Moseley was noted as



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Union Mill, Cranbrook, Kent (1952)

seeking the help of Greensmith's Mill at Burton-on-Trent in his quest for 'old-fashioned flour following on his campaign to teach his neighbours the advantages of the old-time bread', but the general picture is one of a continued decline in the number of traditional working mills in the period leading up to and immediately after the First World War.

The conservation background

Little effort was made during this period to protect redundant watermills and windmills, other than a very few which were restored as antiquarian curiosities or landmarks, such as Bidston Windmill (Merseyside), which was restored as a landmark in 1894.⁸ The number of working mills continued to decline through the 1920s, and in the early summer of 1929 the Society for the Protection of Ancient Buildings (SPAB), which was founded by William Morris in 1877 in direct reaction to the Victorian approach to restoring old buildings, in particular churches, was asked

what it was doing to protect windmills. As a result of an article in the *Daily Mail*, the SPAB office was inundated with information about and pictures of mills, and the pressure was such that, in 1931, a separate Windmill Committee was formed. In 1946, in the aftermath of the Second World War, the role of the Windmill Section was formally extended to include watermills.

The early 1950s saw a change in policy by the Wind & Watermill Section, with approaches being made to national and local authorities to encourage them to protect and preserve mills. The post mill at Saxtead Green (Suffolk) and the tower mill at Berney Arms (Norfolk) were subsequently taken under the wing of the Ancient Monuments Branch of the Ministry of Works. A diminishing number of traditional millwrights was still available to carry out repairs and maintenance, but this was partly compensated for by a growing band of volunteers, who worked on a number of windmills, carrying out weather-proofing and holding repairs and, in certain cases, full restorations to working order. Local authorities and the National Trust also had an increasingly significant role to play in the protection and conservation of mills, although this rarely extended beyond the upkeep of the structure until the 1980s. In 1960, Norfolk County Council set up a fund for windmills and the Norfolk Windmills Trust was formed in 1963, initially taking on 18 windmills and windpumps in a major restoration programme.⁹ Other county and local authorities took on responsibility for individual mills, invariably windmills rather than watermills – for example Chesterton Windmill (Warwickshire), in the late 1960s. The National Trust, which already owned a number of mills and water-power sites attached to a variety of properties, is now responsible for more than 40 watermills and windmills in England, which are maintained in varying condition from consolidated ruins to fully working¹⁰ (see Appendix A for a provisional list).

By the mid-1990s, it was recognised that the terms 'windmill' and 'watermill' were perhaps too narrow, when a growing proportion of the listed building casework (the SPAB is one of the statutory bodies that has to be informed of any application made to change the status of a listed building) was concerned with other types of mill and industrial buildings that may not have used natural power. The title 'Mills Section' was therefore adopted in 1998. The Mills Section is the national amenity society for



Mildred Cookson, Mapledurham Watermill -
the last working mill on the Thames

the study and protection of traditional mills in England, and its total membership in September 2002 numbered 1,085. Although, in common with many similar societies, the average age of members is increasing, total membership of the Mills Section has increased over the last five years and now includes a 'Young Millers' section, currently numbering 59. There are also at present some 14 local, regional and county mill groups in England.

Some statistics are available that can be used to indicate the nationwide decline in the number of traditional mills during the twentieth century. In the old county of Lincolnshire, 215 windmills, or substantial remains of them, were listed in 1923, of which 48% were still at work. By 1951, the proportion of working mills had declined to only 3%.¹¹ In 1986, the remains of 130 windmills were recorded, 60% of the 1923 total, of which 6% were working or workable, a figure that had increased to 10% by 2000.¹² A similar pattern can be found elsewhere, for example in Essex, where there were 140 working windmills in 1886, 49 in 1908, 24 in 1917 and only 14 at most working or partly working by about 1932.¹³ In 2000, there were 14 preserved mills open to the public in Essex, of which 9 were windmills.¹⁴ These figures indicate a significant loss of traditional mills over a 50-year period between 1880 and 1930, followed by increasing awareness of their value as historic buildings and machines, and the subsequent protection and restoration of a select number. It is unfortunate that no comparable statistics are available for watermills. A similar pattern may be anticipated, but it is probable that the number of preserved mills will be proportionally lower than for windmills, which

are generally less adaptable to conversion to other uses. While some mills have been deliberately preserved, it is apparent that many have survived due to chance circumstances, such as sympathetic ownership. By far the greater number of mills, both water and wind, have, however, been lost to demolition or conversion.

Traditional milling revival

The wholemeal revival, which was part of a broader interest in healthy food that gathered pace during the 1960s, was also responsible for a number of traditional mills being repaired and restored and opened as small businesses producing stone-ground meals and flours. This revival had older roots, however, an early example being Dean's Mill at Lindfield (Sussex), which was taken on by Mr and Mrs Horsfield in 1935, on the retirement of the previous miller. Although Margaret Horsfield had no earlier experience or connection with milling, her desire to make wholemeal with which to feed her own family led to the establishment of a successful milling venture. In 1955, the business moved to a watermill at Pentrefoelas (Clwyd) and subsequently closed when Mrs Horsfield retired, although Dean's Mill continued in production into the mid-1970s.¹⁵ Watermills, rather than windmills, were usually the first choice for those who set out to establish small milling businesses in the 1960s and '70s, as the predictability of the power source was, and remains, an important consideration. Other ventures from that time included Priston Mill (Somerset) and Little Salkeld Mill (Cumbria), the latter still at work, producing a range of organic meals and flours. Also in the 1970s, a small number of mills that were still working regularly, producing animal feeds, took advantage of the growing demand for wholemeal products and added stone-ground meals and flours to their product ranges, for example Clapton Mill, Crewkerne (Somerset) and the windmill at North Leverton (Nottinghamshire). Some local authority and National Trust mills were taken on by enthusiastic volunteer groups, in order to repair and run them on a regular basis and, where the equipment survived, to produce stone-ground wholemeal, and a number of private and volunteer



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restorations also resulted in working mills. The dividing line between those mills that are run on a commercial basis, providing an income for the owner/miller through flour sales, and those that are capable of milling but do so only on a part-time basis, on special occasions or simply for sale to visitors during the summer season, is sometimes difficult to define precisely. There are also a small number of mills designated as museums, where regular milling demonstrations take place and flour is sold – for example, Worsbrough Mill Museum (South Yorkshire), Mill Green Mill, Hatfield (Hertfordshire) and the Lurgashall watermill re-erected at the Weald & Downland Museum (Sussex).

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George Foster, Miller, North Leverton (1930)

In March 1987 the Traditional Corn Millers' Guild (TCMG) was set up by a group of small, independent millers to promote the use of natural power and traditional stone-ground products. The original conditions of membership were that the mill must work primarily for the support of its miller, the products must be stone ground, and the power source used must be primarily natural – that is, water or wind. It was acknowledged from the start that, for business reasons, some mills would also need to use

auxiliary power. Mills that were run only from time to time by volunteers or were considered primarily as museums did not meet the original criteria for membership, although, because of subsequent changes in the status of a number of mills, the conditions for joining the Guild are now more relaxed. The original membership comprised 16 mills, of which some 25% were established family milling businesses. The Guild now has 21 mill members in England: 15 watermills and 6 windmills; a further 4 watermills in Wales and Scotland are also members¹⁶ (see Appendix B). The total number of TCMG mills has remained relatively constant over a period of about 15 years, although there has been considerable change in the personnel, with only seven of the original founding mills remaining active, and several of the founder millers who had roots in the commercial flour milling industry have subsequently retired.

The Guild mills run, on average, between one and three pairs of millstones, with outputs of between 0.5 tonne to 5 tonnes a week. Many of the mills, particularly those with the lower milling outputs, usually have other business activities, such as a tea-room, bakery, shop, workshops or holiday accommodation, alongside them, to produce additional income. The mainstay of the majority is stone-ground wholemeal, although most of the larger output mills offer a range of products, including unbleached white flour, self-raising flour and mixed products, such as a granary-type flour. Speciality grains are also milled, including spelt and rye, and a number of the mills grind a high proportion of grain that has been grown organically. A small number of mills also supply and deal in other milled products, including animal feeds.

From the late 1980s, there has been an increased interest in organically grown products, which provide a good specialisation for traditional mills. Most are small businesses run by one person, with family support or part-time employees who help pack and deliver products. The main outlets for wholemeal and stone-ground products are individual customers seeking specific quality flours, wholefood shops and restaurants (including some based at or run in association with mills), ethnic communities (chapatti flour is an important mainstay for the businesses of at least two Midland watermills) and bakeries. Modern bakers demand a consistency of product that is sometimes difficult to achieve in a small mill, where flour-testing

facilities are usually limited. Traditional milling with stones must be regarded as a craft, and therefore a craft approach to baking is also necessary – that is, where a baker is prepared to work within broader quality parameters with the flour as supplied by the miller. Advantages of small milling concerns have been identified as the local nature of the product (some small mills buy specifically from local farmers and growers), and the simplicity of the product, where limitations in milling plant and capacity lead to a tendency not to over-refine or introduce additives.

A small number of traditional mills still work on a regular basis to produce animal feedstuffs. The windmill at North Leverton (Nottinghamshire), which was originally built as a subscription mill in 1813, is still maintained and run by a small group of local farmers and shareholders. Maxey Mill (Cambridgeshire) is in continuous employment grinding barley meal for pig feed, with two pairs of millstones driven by a waterwheel. There is perhaps a handful of other watermills in England that are regularly used by farmers grinding for their own use, perhaps once or twice a week, for example at Monkokehampton (Devon) and Iwerne Minster (Dorset).

Other mill functions

As well as corn and flour mills, a number of other water- and wind-powered installations also survive. As with corn mills, the majority of these are restorations that have been carried out over the last 30–40 years. These include timber sawmills, iron forges, water-pumping machinery and other agricultural and industrial uses. Textile mills, drainage mills and electricity generating plants are not considered here. Sawmills are represented by a small number of survivals, including Gunton Park (Norfolk), which has been repaired and is maintained and demonstrated by members of the Norfolk Industrial Archaeology Society, and the estate sawmill at Simonsbath (Somerset), approaching the end of a major restoration project undertaken by the Exmoor National Park Authority to return it to working order for use as an estate timber yard and workshops. Its machinery will be powered by a late nineteenth-century water turbine and an oil engine. One of the main considerations of returning old woodworking machinery and saws to working order is the need for compliance with modern health and safety standards.



Watermill at Hele, Devon (c. 1900)

Only five water-powered iron forges remain in England in anything like a complete state: one in Devon, one in the Midlands and three in Yorkshire. At a number of other sites, the remains of a water-powered metal-working industry can be seen, but at only four sites – Finch Foundry (Devon), Churchill Forge (Worcestershire), Abbeydale, Sheffield and Wortley Top Forge (Yorkshire) – is water power still used, albeit for demonstration purposes only. At present, none of these forges is used for production, although authentic demonstrations, such as hand forging, are made at some.

There are significant remains of water-pumping machinery, both water and wind powered, and a small number of other industrial sites where water power was used, some of which have been restored to working order. An assessment of these sites in relation to corn mills (based on *Mills Open*, 2000 – see Table 1) indicates that they form about 20% of the total number currently available to visitors. While some small domestic water-pumping plants are owned and maintained privately, the larger industrial sites are usually opened and run as site museums by trusts, for example the china clay museum at Wheal Martyn, St Austell (Cornwall) and the mining site and port at Morwellham Quay, Tavistock (Devon), at both of which the use of water power is demonstrated. The role of local trusts and volunteers, such as regional mill groups and industrial archaeology societies, in preserving, restoring and maintaining many of these sites is significant. A broad interest base, with access to a variety of skills and enthusiasms, is perhaps more readily apparent at some of these industrial sites than at traditional corn mills, where there is a more direct need for skilled craftsmen, both to operate and to maintain them.

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Mills at Work and Open to Visitors

The figures used for this section are based on the *Mills Open* publications of the Mills Section, SPAB.¹⁷ Three editions, 1981, 1991 and 2000, have been used and the figures are given in Table 1. In summary, 153 mills were listed in 1981 in England, 227 in 1991 and 337 in 2000. Of these, 77% were corn mills in 1981, and 80% in 2000. The number of operable corn mills was 34 in 1981, increasing to 62 in 1991 and to 95 in 2000.

The proportion of commercial mills, that is those that mill throughout the year and market their products, has remained reasonably constant, at between a quarter and a third of the total of workable mills. This is a relatively small number, due to a number of factors. The suitability of a mill for small-scale commercial production appears to be as dependent on the desire of an owner/miller to fulfil a dream or to create a successful business as on geographical location and water supply, although the distribution of small-scale commercially working mills does suggest that there may be an optimum number of mills that can compete successfully in a given area.



Grinding stone at Weald and Downland Open Air Museum

© Greenhalf Photography

Table 1: Mills open¹⁸

1981	Cornmills	Capable of milling	No. of other uses	
Water	61	24	21	
Wind	57	10	10	
Animal	–	–	3	
Total	118	34	35	Total = 153
1991	Cornmills	Capable of milling	No. of other uses	
Water	93	41	31	
Wind	87	21	12	
Animal	–	–	4	
Total	179	62	47	Total = 227
2000	Cornmills	Capable of milling ¹⁹	No. of other uses	
Water	154	60	45	
Wind	114	35	19	
Animal	–	–	5	
Total	268	95	69	Total = 337

Table 2: Working mills by county

County	Mills open	Capable of milling	Flour for sale	Flour for demo
Bedfordshire	3	1	?	
Berkshire	0	–	–	–
Buckinghamshire	6	1	1	–
Cambridgeshire	18	7	4	3
Cheshire	5	3	1	2
Cleveland	1	1	1	–
Cornwall	3	1	–	1
Cumbria	11	4	2	2
Derbyshire	3	1	1	–
Devon	8	3	1	2
Dorset	10	2	1	1
Durham	1	–	–	–
Essex	14	6	–	6
Gloucestershire	5	–	–	–
Hampshire	11	6	3	3
Herefordshire	0	–	–	–
Hertfordshire	4	2	2	–
Isle of Wight	4	1	1	–
Kent	16	6	2	4
Lancashire	2	–	–	–
Leicestershire	4	1	1	–
Lincolnshire	13	11	5	6
London (Greater)	5	–	–	–
Merseyside	1	–	–	–
Norfolk	12	2	1	1
Northamptonshire	1	–	–	–
Nottinghamshire	4	2	2	–
Oxfordshire	10	3	2	1
Rutland	1	1	1	–
Shropshire	3	1	1	–
Somerset	17	4	3	1
Staffordshire	4	–	–	–
Suffolk	18	4	3	1
Surrey	4	1	1	
Sussex, E	10	3	1	2
Sussex, W	11	4	2	2
Warwickshire	5	2	2	–
West Midlands	3	2	1	1
Wiltshire	3	3	2	1
Worcestershire	3	1	–	1
Yorkshire, E	3	2	2	–
Yorkshire, N	5	1	1	–
Yorkshire, S	2	1	1	–
Totals	268	95	51	44

Source: *Mills Open*, 2000



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As has been said, it is difficult to be precise in the definition of a 'commercial' watermill or windmill. The conditions of membership of the TCMG have already been mentioned and these, together with the information supplied by mill owners and millers to *Mills Open* have been used to compile the figures in Tables 1 and 2. In Table 2 a further distinction is made between mills that grind for sale and those that grind for demonstration. In some instances, mills grind for demonstration rather than sale because of restrictions imposed on their operation by various technical requirements, including those set by environmental health authorities. Some of the mills that grind for sale operate only on a seasonal basis and therefore cannot be considered to be truly commercial. It should also be noted that not all TCMG mills are open to visitors, and not all mills that grind on a regular basis are members of the Guild.

The other uses include textiles, sawmilling, metal working, pumping and drainage and agricultural uses that do not include corn milling. A small number of animal-

powered mills or machines are included in Table 2, which are mostly related to agricultural uses. No differentiation has been made between watermills driven by fresh water and those powered by tidal water. The latter are a small minority (2%), and it is considered that the difference is the source of water, rather than the source of power, and therefore the functions of both types of watermill are fundamentally the same.

The apparent large increase in the number of mills open (220% over 20 years) is due to a number of factors. The most encouraging aspect is that more mills have been restored over this period, but also a number that were already restored or maintained in working order have become accessible to the public, as a result of demand or change of ownership. Not all of the mills listed are open on a regular or full-time basis; some are open by appointment only, while others may be open only a few days each year or on National Mills Weekend, which is organised by the Mills Section, and is usually held over the second weekend of May.



National Inventory and Archives

Part of the original remit of the Windmill Section of the SPAB was to produce a national inventory of windmills and sites. A number of county surveys were undertaken in the late 1920s and those covering Kent, Surrey, Sussex, Essex, London and Middlesex, Hertfordshire and Buckinghamshire appeared in two volumes published in 1930 and 1932.²⁰

A chapter on design and development in the first volume was written by Rex Wailes, the engineer and windmill enthusiast who was technical adviser to the Section from its inception. Wailes wrote many articles and also produced county surveys of windmills, a number of which were published in the Transactions of the Newcomen Society between 1941 and 1965. Several county checklists of watermill remains and sites were also produced by Wailes and by other fieldworkers after the role of the Section was extended in 1946.²¹ The national coverage was, however, inconsistent and of varying quality, and to date no comprehensive county-by-county bibliography has been produced. Some county surveys are still being published, but there is no particular pattern to these and some areas still remain largely uncharted.²² A national checklist of windmills in England has been compiled by the Mills Research Group. Data on 1,143 windmill sites has been collated and put onto computer, and the resulting gazetteer was published in 1998.²³

The Mills Section has held an archive at its headquarters in London since the early 1930s, comprising publications, press cuttings, notes, reports, photographs and casework files. Access to the collection has always been limited, because of a shortage of indexing, manpower and resources. This problem has been partially addressed on several occasions, but the lack of proper archive facilities continues to present difficulties. A recent initiative is the Mills Archive, a charitable educational trust, which was established in 2002 and is currently based in Reading. Although independent, the Mills Archive has a close affiliation with the SPAB, and to date has received funding from a number of sources, including the Heritage Lottery

Fund (HLF) and the Mills Section. Its objectives are to establish and maintain a permanent record repository for historical and contemporary material on traditional mills and milling, concentrating on the United Kingdom. Other collections relevant to the study of mills are held by the Science Museum Library, London, the Templeman Library at the University of Kent, the Museum of English Life at the University of Reading and the National Monuments Record in Swindon. Most local record offices contain some historical materials pertaining to local mills.



Cotehele Mill, Tamar Valley

© Chris Chapman

Traditional Millwrighting

The craft or trade of millwrighting, which covers the construction, maintenance and repair of water- and wind-powered machinery, undoubtedly has its roots in the Roman period, when the first power-driven mills were built.²⁴ It seems apparent from the large number of mills (more than 6,000) recorded in lowland England in the Domesday Book (1086) that specialised craftsmen must have been required to build and maintain them. However, the name 'millwright' as an occupational designation does not appear in England until the fourteenth century.²⁵

The 1851 Census of Great Britain recorded about 10,000 millwrights, ranging from the traditional craftsmen who serviced water- and windmills, to those attached to large engineering concerns.²⁶ This was a time when mechanical and civil engineering were beginning to supplant the more traditional nature of the craft. The role of the millwright was succinctly summed up by William Fairbairn, writing in 1861:

The millwright of former days was to a great extent the sole representative of mechanical art, and was looked upon as the authority in all the applications of wind and water, under whatever conditions they were to be used, as a motive power for the purposes of manufacture. He was the engineer of the district in which he lived, a kind of jack-of-all-trades, who could with equal facility work at the lathe, the anvil or the carpenter's bench ... the millwright of the last century was an itinerant engineer and mechanic of high reputation. He could handle the axe, the hammer, and the plane with equal skill and precision; he could turn, bore, or forge with the ease and despatch of one brought up to these trades, and he could set out and cut in the furrows of a millstone with an accuracy equal or superior to that of the miller himself. ... Generally, he was a fair arithmetician, knew something of geometry, levelling, and mensuration, and in some cases possessed a very competent knowledge of practical mathematics ... he could ... perform a variety of work now done by civil engineers.²⁷

Rex Wailes considered that millwrights were 'usually men of considerable force of character with a capacity for hard work. They had to be tough physically, too.' He also noted that, in the late 1940s, windmills were going out of use at the rate of about one a month and, 'as to the millwrights capable of repairs and renewals to windmills there are not a dozen firms left in the country'.²⁸ After a low period in the 1950s and '60s, when the number of working millwrights continued to decline, there was something of a small revival in the 1970s and '80s. This appears to be due partly to an increased awareness in the heritage value of mills, particularly windmills, and partly to an increase in the availability of funding through grants for listed buildings. A significant number of these new millwrights came from an amateur/enthusiast background. The number of practising professional millwrights has subsequently remained fairly constant.



Contemporary millwrighting

Traditional millwrighting is still carried out by a small number of practitioners who are distributed mainly throughout southern and central England, with one larger company based in Scotland. There is a certain relationship between the geographical locations of the millwrights and the mills that are open to the public, with a dominance in East Anglia and the south-east, particularly as these were traditionally within the main windmilling area of England.²⁹ However, most millwrights are now prepared to work over a wide area, so that geographical distribution is not necessarily a deciding factor for who works where, although there are bound to be some economic considerations.

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Jesse Wightman stone dressing (1947)

The Mills Section has produced a list of approved millwrighting contractors, on which there appear six companies, which employ two or more people, and eight one-man bands (see Appendix C). There is also a small number of other people working as millwrights and restoration engineers who do not appear on this list, but the professional millwrighting community is a small one and generally the practitioners know each other. The one-man band millwrights sometimes collaborate with each other on specific projects and there is an opportunity for the exchange of ideas, information and problems, fostered by an annual millwrights' meeting organised by the Mills Section. There is no formal association or guild of traditional millwrights, although the idea has been put forward from time to time.

Essex County Council is the only authority to employ a full-time millwright. The post was created in 1975 and was

held by Vincent Pargeter from its inception until 2000, when he left to become a self-employed millwright, to be succeeded by Michael Hoyle. The position of county millwright covers a wide range of work on both windmills and watermills, which the council owns or is responsible for, including practical repairs and maintenance, specification and supervision of work by others (both mechanical and constructional), consultancy, management of volunteers, opening the mills to the public and milling.

Of the 14 companies and individual millwrights on the Mills Section's list, only Thompson of Alford (Lincolnshire) can claim a continuity of practice from traditional millwrighting roots, dating from the nineteenth century. The remainder have entered the profession from a variety of backgrounds, some from the building trade, some from a general mechanical or restoration engineering and some from being volunteers and mill enthusiasts. A general qualification for entering the millwrighting profession must be an interest in traditional mills.

The specific skills required of contemporary millwrights include constructional work, particularly the timber framing of post and smock mills and hurst frames (the hurst is the massive timber frame that carries the millstones and often supports and encloses the driving gears); work on gearing and shafting, including making and repairing timber gears and fitting individual wooden cogs (gear teeth) to both timber and iron gears; setting up bearings and drives; repairs and rebuilding waterwheels and windmill sails; and setting up milling machinery, including dressing millstones. Much of the work involves moving and raising heavy weights, sometimes in confined spaces. While some of this labour can be carried out by a miller, custodian or enthusiastic amateur, a millwright should be able to offer a breadth of experience, a knowledge of traditional practice and an ability to undertake heavy or complicated work, such as the installation of a new waterwheel shaft or putting up windmill sails, which may be beyond the practical capabilities of the amateur.





Amos Clarke adzing a weatherbeam. Pakenham, Suffolk (1950)

A professional millwright should also be able to bring management and organisational skills to a project, so that the work can be carried out safely and competently, within an agreed time scale and to a price. In cases where a mill repair or restoration project is financed with grant money, it is usually a requirement that the work be undertaken by an experienced professional.

A number of millwrights also carry out regular maintenance on mills that are working and/or open to the public. This is particularly important when a mill is run by more than one person, such as a group of volunteers; a mill is an engine and therefore needs to be regularly inspected and serviced, to ensure that the machinery is maintained in good, safe working order. A mill that is worked regularly will generally need more maintenance than one that is worked only occasionally, although standing idle for long periods can bring particular problems to machinery, particularly parts made of timber.

A brief questionnaire was circulated to the 14 millwrights and restoration engineering companies on the Mills Section's list, to which there were 11 replies. One of the larger companies and one individual did not respond and one individual declined to complete the questionnaire. The results are summarised as follows, based on the 11 completed questionnaires, one of which provided details of four specific employees. The following analysis is therefore based on information from 14 individuals.

Of the larger companies that employ from two to ten men directly on millwork, two work full time and the others from 25–50% of the time on mills. Most of the individuals work on millwrighting full time, although one undertakes a higher proportion of restoration engineering and museum work than millwork at present. Several of the one-man concerns replied that they use specialist subcontractors and other selected labour as and when required. The majority work on both watermills and windmills, although two individual millwrights (of the original 14) are known to specialise largely in windmill work. The majority (over 80%) offer millstone dressing as a particular skill.

The practising millwrights come from a variety of backgrounds: 80% are predominantly from craft or engineering roots, 43% have served apprenticeships, usually in engineering, and 43% are largely self-taught. The remainder (two) followed their fathers into the trade. The depth of experience ranges from 6 to 46 years, with an

overall average of about 25 years per man. Most started working on mills in their twenties, and only one return included a teenaged apprentice. Only a small proportion came from completely unrelated backgrounds, the majority having progressed from school, an apprenticeship in engineering or work in building and surveying, into full-time millwrighting. Of the 14 who replied, 3 hold degrees, while more than half hold qualifications in the form of City & Guilds, HNC or HND, generally in a related field, particularly engineering. More than three-quarters – 78% – confirmed that they have or have had a mentor, that is, an experienced millwright with whom they have worked or to whom they could turn for help and advice.

Regarding the business side of millwrighting, 55% felt that some business training would be an advantage. The workload generally appears to be rising, with 64% recording an increase, 27% considering it to be relatively static and only one company noting a drop. Overall, 36% replied that their workload is too large and 36% (perhaps predictably those not fully employed on millwrighting work, who also are not turning work down) that it is too small; the remainder consider their workload to be about right. Trading profits over the last five years were considered to be slightly higher, although one larger company recorded a fall. Generally, it is the larger companies that advertise their services, through specialist trade papers, websites and promotional leaflets. Recommendation by word of mouth was considered of particular importance.

In general terms, the level of business turnover appears to be between about £30,000 a year – the baseline for the self-employed one-man bands – and £2 million for the larger companies, although this latter figure includes work other than on mills. The number of self-employed one-man band millwrights suggests that there are some advantages in being a small, independent company. The current situation regarding the number of working millwrights and the number of mills to be repaired and maintained indicates that there is adequate work for these smaller businesses.

Training and Education

Millers

The majority of contemporary millstone millers are largely self-taught; a small number have gained experience working with other millers, including some who have had the benefit of those who survived from the last generation of working millers from traditional roots.

There is no formal training available for traditional millers, those who wish to run millstones in watermills or windmills. A City and Guilds examination on milling was established in 1882,³⁰ but I know of only one traditional miller who followed this course (in the 1960s) before taking on a windmill. It has been noted that 'stone milling was a multi-skilled trade in which, besides mastery of the milling process, the miller had to understand fickle natural sources of energy and sometimes steam power'.³¹ Roller milling quickly developed beyond the level of practical skill required by a traditional millstone miller to a highly mechanised industry, although the basic principle of trying to make a uniform product from raw materials highly variable in their nature still persisted. Milling science took over from the craft of stone milling and thus contemporary roller milling practice appears so far removed from traditional stone milling that, rightly or wrongly, it is generally considered not to be relevant. However, some training in cereal science, flour and product testing and business methods would undoubtedly be of value to many would-be traditional millers.

James Waterfield, who runs the Maud Foster Mill, a large tower windmill in Boston (Lincolnshire), began his training as a young boy in the 1970s, and worked with a number of traditional windmillers, most of whom are now deceased. He worked at three windmills and one watermill, the latter an already established business, before taking on the derelict Maud Foster Mill, where he now produces the largest output from a windmill in England. Some stone millers have inherited a family milling business, for example, Michael Stoate, at Cann Mills, Shaftesbury (Dorset), who is the descendant of a family that first established a milling business in Somerset in 1832. However, most contemporary water- and windmillers, amateur and professional, are practical people who have learnt their craft simply by restoring and running mills, usually with some contact with others who have followed a similar path.



Millwright Martin Watts restoring Clyston Mill, Devon

Opportunities exist for would-be traditional millers to learn more about the craft by working in established mills. The Midland Wind and Water Mills Group organises milling weekends at Charlecote Mill (Warwickshire), a watermill in full-time use with an output of 2 – 2.5 tonnes a week. All of the processes involved with running a watermill and making stone-ground flour, including millstone dressing, are taught. The Mills Section also runs an annual one-day course for mill owners and custodians, and other regional mill groups have organised working days or weekends during which various aspects of taking on, repairing and running mills are covered. Some millwrights are also experienced in milling and can offer a basic training to volunteers or custodians of mills on the completion of repair or restoration works.



There is one area of concern, however: namely, misinformation about the traditional craft. This must be a symptom of any craft that has virtually died and has then been resurrected by enthusiasts. The lack of closely documented experience from previous generations who ran and maintained traditional mills has meant that a great deal of information has been lost.³² As a result, the pressures on contemporary small millers and millwrights to succeed in business without having ready access to the knowledge of their craft, through apprenticeship, formal training or the guidance of experienced practitioners, has led to a considerable difference between the operating capabilities of a number of mills and also to a wide variation in the quality of their products. As mentioned at the start of this chapter, much of the craft skill of producing flour on millstones was lost in the first half of the twentieth century, when many water- and windmills closed down and many others were reduced to animal feed or provender milling, because of the commercial dominance of the modern milling industry and roller mills. Many of the skills of millstone dressing and flour production have therefore had to be rediscovered, by practice, observation and study of what documentation has survived. It is acknowledged, however, that the role of contemporary stone-grinding mills has changed, in that they are producing different types of meal and flour, from different grain types, than was the case a century or so ago. Wholemeal production in the early twenty-first century is not as demanding as white flour production, using millstones, must have been in the second half of the nineteenth century.

Millwrights

The same considerations generally apply to contemporary millwrighting. Many of those now working professionally on the repair and maintenance of mills have a broad engineering or craft background and there is therefore a high degree of technical competence in much of the work that is carried out. The progression from millwright to engineer in the historic foundation of the craft, from the second half of the eighteenth century, is very much apparent in the surviving machinery of English water- and windmills, with generally a high proportion of ironwork in shafting and gearing. However, the repair and maintenance of traditional mills need to be considered as more than simply putting good engineering into practice. Historic and



Stanley Jupp, Outwood Post Mill, Surrey (1950)

aesthetic considerations are also relevant, when working on buildings and machinery that are an important part of the national heritage. Understanding the theory of machines, gearing profiles, loads and bearings is only part of the requirement for contemporary millwrights; a broader practical appreciation of the working capabilities of a machine made essentially of timber and metal, and getting the best out of a variable power source, can only really be discovered through experience of working such machinery. In this respect the craft tradition – the feeling for the machine and understanding its abilities and limitations through everyday use – is far more important than trying to make it operate within theoretical parameters. The working speed and capacity of millstones is a good case in point; many books written about watermills and windmills state that the 'correct' running speed for 4-foot diameter stones is 120 rpm. This theoretical figure appears in late nineteenth-century millwrighting and engineering tables³³ and is apparently based on calculations of millstones driven by a constant and regular prime mover, such as a steam or internal combustion engine. The variations in speed and power that can occur when driving millstones by a waterwheel and, more particularly, windmill sails, cannot be so precisely defined. It has always been part of the traditional miller and millwright's skill to obtain the best performance from his mill by his own understanding and experience of its capabilities in differing weather and working conditions. Such skills cannot be taught in a classroom.

Conservative and technically accurate repair has been advocated by the SPAB since 1877 and by the Mills Section since the 1930s. The Section's *Philosophy of Repair* (see Appendix 3D) lays down basic guidelines for the repair and protection of traditional watermills and windmills and two more specific conservation guides have been produced.³⁴ These guidelines are tempered with practicality to allow mills that are to be put back to, or to continue in, work to comply with environmental health and health and safety regulations, which have become more stringent. It is an important part of the contemporary millwright's role to keep machinery in safe working order, for the operative, the visitor and for the survival of the mill itself. When working on mill machinery, there is often a requirement for a greater amount of renewal than might normally be anticipated when repairing an old building, because of the need to rebuild waterwheels and windmill sails in order that they can perform work, and to allow for the regular replacement of parts that wear as a result of use, such as bearings, gear cogs and millstones.

The formal training of would-be millwrights is only really practical at present for the larger companies and there is a general feeling that apprenticeships do not work for a number of reasons. In recent years some young

people have started training to become millwrights, but have invariably not lasted the course, or have moved on to other areas of the construction industry where there appear to be better financial rewards and working conditions. Although millwrighting work should command a higher level of remuneration than, for example, building construction, because it is highly specialised, much of the work is site-based and can be arduous, with the need to work away from base for certain periods, sometimes in awkward and physically restricted conditions, often out of doors in all weathers. The majority of professional millwrights indicated that they have enough work and that turnover is steady or increasing, and some are turning down jobs, or selecting specific projects. This all indicates that there must be an opportunity for more trained or skilled practitioners, although it is not clear how they may be found. In response to this question, several of the millwrights who completed the questionnaire responded that they considered present provision for training millwrights to be generally inadequate. One suggestion made was that master classes in millwrighting could be taught as part of already established building conservation programmes and courses. This needs to be directed at a number of levels, but particularly to 'hands-on' training, rather than at undergraduate or graduate level. The self-employed one-man-band millwright is usually too busy carrying out the work himself to have time to spend teaching and would usually be better served by someone working alongside him who already has a basic understanding and some experience of millwrighting, or at least carpentry or practical engineering. Some financial support is therefore necessary at all levels to enable practising millwrights to take on trainees.

Over the last 30 years or so, the amateur millwright has had a significant role to play in the repair and running of watermills and, in particular, windmills. In the 1960s a small but significant number of projects were undertaken by amateurs and mill enthusiasts, which resulted in the protection, repair and, in some cases, working restoration of several mills, for example the post



Stelling Minnis Mill, Kent Downs AONB

© Mike McCoran



Milling and Millwrighting



mill at Wrawby (Lincolnshire). More recently the tower mill at Thelnetham (Suffolk) and the smock mill at Wicken (Cambridgeshire) have been acquired by groups of enthusiasts who, by taking shares, have sponsored the purchase and subsequent restoration of both mills to full working order. This was achieved through voluntary working parties and small capital input spread over a number of years and has been extremely successful. The work has also been thoroughly researched, planned and carried out to a high standard, avoiding many of the contractual pressures imposed on the professionals. Such an approach can only work, however, where there is a well-established local or regional group, and a core of dedicated and knowledgeable enthusiasts.

There is also an important role for consultants with particular experience, through knowledge of mills or working practice as amateurs, to supervise millwrighting projects. A number of millwrighting contractors undertake consultancy work and produce schedules, specifications and drawings for others to tender against and carry out the work. High-quality work has also been carried out on mills by skilled craftsmen from other trades, such as general engineers, carpenters and shipwrights, sometimes overseen by a specialist or consultant with a particular knowledge of mills. In practice, many millwrights work alongside other specialists and craftsmen, including architects, builders and engineers, as well as informed amateurs, on mill repair and restoration projects.

The involvement of a professional millwright, or a millwrighting consultant with practical experience of working on mills and machinery, is likely to become increasingly important as more funding is made available by English Heritage and the Heritage Lottery Fund; it is considered that such specialists are essential for mills to be properly repaired and maintained in the future. In particular, the specification and supervision of repair works need to be undertaken by those with both a detailed knowledge of and practical experience in the design, construction and working of mills and their machinery. It is vital that features and variations of design due to region or period, or to the work of a particular millwright, are acknowledged and understood before repairs commence so as to ensure that mills are properly repaired and conserved. It is therefore essential that some initiative is taken in the field of training while there are still a number of experienced millwrights who can pass on their knowledge.

Funding

No concerted effort has been made by any group or body to obtain funding for the training of millers and millwrights. The Norfolk Windmills Trust obtained some European funding for six countries to offer a small number of trainees to gain practical millwrighting experience in a project that took place in 1997. In England, the efforts were concentrated on some works carried out at Billingford Mill, a tower mill near Diss (Norfolk).³⁵ The amount of training that took place and the success of this project are not known.

© Greenhalf Photography



Watermill at Weald and Downland Open Air Museum, West Sussex

The amount of specialist millwrighting work currently being undertaken appears to be in excess of the number of professional millwrights. This is due in part to increased funding being made available by the Heritage Lottery Fund (HLF). A large scheme involving work on eight windmills in Kent (for Kent County Council) is nearing completion, and a project of similar scale is getting under way in Norfolk. Elsewhere, individual mills have benefited from HLF funding in association with other local and national grants. An ongoing concern is the lack of available funding for the repair and maintenance of mills that are owned and run privately, rather than by trusts or local authorities. Some grant aid is available from English Heritage for mills listed Grade I or II*, but these are a

small proportion of the whole. The Mills Section has a Mill Repair Fund, which makes small grants available to mills for such items as emergency weatherproofing and paint, usually in circumstances where no other funding would be forthcoming.

More sponsorship from local and national government and the HLF is considered to be essential if mills are to survive and continue to function as intended. Millwrighting is becoming increasingly expensive, particularly as good-quality materials are becoming more difficult to source, for windmill sails, for example, and also certain one-off components, such as large iron castings, are relatively costly to produce. There is currently a move by English Heritage to compile lists of accredited contractors to carry out works funded by them. With only a small number of millwrights available in the first place, this could result in even higher repair and restoration costs, although not necessarily higher standards.

In reply to questions concerning the provision for mill repair in the future and what concerned them most about the future of traditional millwrighting, the majority of respondents highlighted better funding for repair projects and the need for sponsorship or organised funding for training millwrights. It is also considered that the general profile of traditional mills, milling and millwrighting needs to be raised, to increase public awareness of this significant part of our national heritage. On balance, the millwrights appear to be relatively optimistic about the current and future provision for the repair and maintenance of water- and wind-powered machinery, but this may be a slightly shortsighted view. The number of experienced millwrights will



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undoubtedly decline over the next 15 – 20 years and, unless some training initiative is taken in the near future, a great deal of knowledge and experience will be lost. While the best way to pass on the knowledge base that exists at present would be through site training and practical work, at the very least a repair and conservation manual, drawing on as much of the experience as possible of current millwrights, professional and amateur, should be compiled.

The responsibility for raising the profile of mills and increasing public awareness must lie with the Mills Section, SPAB, English Heritage and the National Trust, as the main conservation bodies. It is important that better funding is secured, from the HLF, English Heritage and local

authorities, for example, which allows not only for repair and restoration projects, but also for ongoing maintenance, which is essential to watermills and windmills. Funding is also necessary to support those few mills that continue to work privately, the repair and maintenance of which are no less costly than a static, preserved mill. If a truly representative sample of these important historic buildings is to be kept and maintained, including some in working order, then it is essential that funding for repairs and maintenance is matched with funding for training millers to work water- and wind-powered machinery and also for sponsoring the next generation of practical millwrights who can repair and maintain them.



Notes

- 1 The number of mills is largely based on the publication *Mills Open*, produced by the Mills Section, SPAB, in a number of editions, the most recent being the sixth edition of 2000 (see Table 1).
- 2 There are many publications that detail various aspects of traditional milling and fewer that deal with the change to the modern industry. For a brief summary, see Martin Watts, *Corn Milling* (Princes Risborough, 1998), and for a recent study of the modern industry, Glyn Jones, *The Millers: A Story of Technological Endeavour and Industrial Success* (Lancaster, 2001).
- 3 See Jennifer Tann and R. Glyn Jones, 'Technology and Transformation: The Diffusion of the Roller Mill in the British Flour Milling Industry, 1870–1907', *Technology and Culture*, 37.1 (1996): 36–69. I am indebted to Professor Collins for directing me to this article.
- 4 *Ibid.*, 65–6.
- 5 *Ibid.*, 62.
- 6 Allinson, publicity booklet, nd, supplied by Queen's Mills, Castleford, Yorkshire, 1981.
- 7 An article on old mills by Percy W.D. Izzard, *Daily Mail*, 21 February 1911.
- 8 For a brief summary of the mill preservation movement, see Martin Watts, *Water and Wind Power* (Princes Risborough, 2000), pp. 119–21.
- 9 Summarised in Martin Scott, *The Restoration of Windmills and Windpumps in Norfolk* (Norfolk Windmills Trust, 1977).
- 10 A general summary of National Trust mills can be found in David Thackray, 'The Industrial Archaeology of Agriculture: Rural Life Collections and the National Trust', *Industrial Archaeology Review*, 18.1 (autumn 1995): 117–31.
- 11 The annual report of the Wind and Watermill Section for 1951 stated that 'for reasons not always appreciated, the working windmill is doomed', and it was estimated that only about 10% of windmills that were active in 1924 were still at work.
- 12 From Watts, *Water and Wind Power*, p. 119.
- 13 Donald Smith, *English Windmills*, vol. 2 (London, 1932), p. 35.
- 14 *Mills Open*.
- 15 Derek Stidder and Colin Smith, *Watermills of Sussex*, vol. 2 (2001), pp. 102–3; notes by Margaret Horsfield, Molicon '79, conference folder (Bromsgrove, 1979).
- 16 I am indebted to Jonathan Cook, secretary of the TCMG, for this information.
- 17 *Windmills and Watermills Open to View*, compiled by Jenny West (London, 1981); *Mills Open* (London, 1991); *Mills Open*, 6th edn. (London, 2000).
- 18 *Windmills and Watermills Open to View; Mills Open* (1991); *Mills Open* (2000); information supplied by the Traditional Corn Millers Guild.
- 19 See Table 2 for a county analysis of mills capable of milling in 2000.
- 20 M. I. Batten, *English Windmills*, vol. 1 (London, 1930); Smith, *English Windmills*, vol. 2.
- 21 For example, J. Harold Norris, 'The Water-powered Corn Mills of Cheshire', *Transactions of the Lancashire and Cheshire Antiquarian Society*, 75–6 (1965–6): 33–71; J. K. Major, *Mills of the Isle of Wight* (London, 1970).
- 22 The most recent were Stidder and Smith, *Watermills of Sussex*, vol. 1, East (1997), vol. 2, West (2001).
- 23 A. A. Bryan/Mills Research Group, *Windmill Gazetteer for England* (Manningtree, 1998).
- 24 For a recent overview of the development of water-, wind- and animal-powered corn mills in Britain, see Martin Watts, *The Archaeology of Mills and Milling* (Stroud, 2002).
- 25 John Harvey, *Medieval Craftsmen* (London, 1975), p. 26, refers to William de Colborn, a millwright who was enrolled at York in 1387. The use of the name becomes more frequent during the fifteenth century.
- 26 A. E. Musson, *The Growth of British Industry* (London, 1978), p. 118.
- 27 William Fairbairn, *Treatise on Mills and Millwork*, Part 1 (London, 1861), pp. v – vi.
- 28 Rex Wailes, *Windmills in England* (London, 1948), pp. 29, 6.
- 29 This is clearly shown on the map in *ibid.*, p. 44, which indicates that the principal windmill area was to the east of an imaginary line drawn between the Solent and the Tyne.
- 30 Tann and Jones, 'Technology and Transformation', p.68 (note 3).
- 31 *Ibid.*, p.58.
- 32 There is no classic overview of the millwright's craft written from a practical point of view as there is, for example, on wheelwrighting, with George Sturt's *The Wheelwright's Shop* (1923). There are useful chapters on 'Work on Watermills' and 'Windmill Repairs' in Walter Rose, *The Village Carpenter* (1937), and also 'The Miller and Millwright', in George Ewart Evans, *The Farm and the Village* (1969).
- 33 For example, James Donaldson, *The Roller Mill and Silo Manual* (Liverpool, 1901), pp. 99–101.
- 34 *Some Principles and Practice in Watermill Repair and Windmill Repair*, SPAB Mills Section (London, 1994).
- 35 Mills Section, *Newsletter*, 70 (January 1997), p. 7.

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Appendix A

Table A1: Provisional list of National Trust mills

County	Mill	Mill type*	State
Buckinghamshire	Pitstone	X/corn	static
Cambridgeshire	Lode Mill, Anglesey Abbey	O/corn	working
	Houghton Mill	O/corn	working
	Wicken Fen	X/pump	working
Cheshire	Dunham Massey	O/saw	static
	Nether Alderley	O/corn	working
	Quarry Bank, Styal	O/textile	working
Cornwall	Cotehele	O/corn	working
	Danescombe, Cotehele	O/saw	remains only
	Poltesco, Ruan Minor	O/corn	under repair
Cumbria	Acorn Bank, Temple Sowerby	O/corn	static
Derbyshire	Stainsby	O/corn	working
Devon	Manor Mill, Branscombe	O/corn	working
	Clyston Mill, Broadclyst	O/corn	working
	Finch Foundry, Sticklepath	O/forge	working
	Fingle Mill, Moretonhampstead	O/corn	ruins only
	Wembury	O/corn	tea-room
Dorset	Boar Mill, Corfe Castle	O/corn	working
	West Mill, Corfe Castle	O/corn	site only
	White Mill, Shapwick	O/corn	static
Essex	Bourn Mill, Colchester	O/corn	working
Hampshire	The Vyne, Sherborne St John	O/pump	static
	City Mill, Winchester	O/corn	working
Isle of Wight	Bembridge	X/corn	static
Norfolk	Blakeney	X/corn	static
	Burnham Overy	O/corn	static
	Burnham Overy	X/corn	house
	Horsey	X/pump	static
Northumberland	Cragside	O/electricity	demo.
Oxfordshire	Buscott Park	O/pump	static
	Coleshill	O/corn	static
Shropshire	Attingham Park	O/pump	static
Somerset	Dunster	O/corn	working
	High Ham	X/corn	static
	Horner	O/corn	turning
	Piles Mill, Selworthy	O/corn	static
Staffordshire	Shugborough	O/corn	working
Suffolk	Flatford	O/corn	field centre
Surrey	Shalford	O/corn	static
Sussex	Park Mill, Bateman's	O/corn	working
Wiltshire	Stourhead	O/pump	static
Yorkshire	Bransdale	O/corn	static
	Fountains Abbey Mill	O/corn	static
	Gibson's, Calderdale	O/textile	

Notes: O = watermill; X = windmill

Source: *The National Trust Handbook, 2002 – 3*

Appendix B

Table A2: Mill members of the Traditional Corn Millers' Guild (TCMG)

Mill	Type
Alderholt, Dorset	water
Alford, Lincolnshire	wind
Boston, Lincolnshire*	wind
Cann, Shaftesbury, Dorset*	water
Charlecote, Warwickshire*	water
Claybrooke, Leicestershire	water
Dunster, Somerset	water
Heatherslaw, Northumbeland	water
Kirton Lindsey, Lincolnshire	wind
Letheringsett, Norfolk	water
Little Salkeld, Cumbria*	water
Lurgashall, Sussex (Weald & Downland Museum)	water
Mapledurham, Oxfordshire*	water
Mill Green, Hatfield, Hertfordshire	water
Offley, Staffordshire	water
Otterton, Devon*	water
Redbournbury, Hertfordshire	water
Sarre, Kent	wind
Swaffham, Cambridgeshire	wind
Wellesbourne, Warwickshire	water
Whissendine, Rutland	wind

Note: *denotes a mill run by a founder member of the Guild

Source: Jonathan Cook, *TCMG Secretary; as at October 2002*

Appendix C

List of millwrights (from the list compiled by the Mills Section, SPAB, May 2002):

The British Engineerium Trust Ltd., Hove, Sussex

Ian M. Clarke, Winchester, Hampshire

Malcolm Cooper, Melksham, Wiltshire

Dorothea Restorations Ltd., Stockport, Cheshire, and Bristol, also incorporating Ernest Hole, Engineers, of Burgess Hill, Sussex.

J. C. H. Fairbanks, Stone, Staffordshire

Heritage Engineering Ltd., Glasgow

IJP Building Conservation Ltd., Henley on Thames, Oxfordshire

Janes Ltd., Cranborne, Dorset

Neil Medcalf, Alford, Lincolnshire

Vincent Pargeter, Ingatestone, Essex

Richard Seago, South Walsham, Norfolk

R. Thompson & Son, Alford, Lincolnshire

Anthony Unwin, Helston, Cornwall

Martin Watts, Cullompton, Devon

Appendix D

A philosophy of repair of windmills and watermills

Windmills and watermills are an irreplaceable part of our national heritage. They form a vital part of the traditional landscape and have an important place in the history of industry, engineering and technology, in the development of motive power and the processing of raw materials. In their structure and machinery they represent an enduring quality of craftsmanship. Mills have a unique place in the tangible record of the past, and their proper protection, repair and continued working are the sincere objectives of the Mills Section.

The majority of mills have already been lost, due to disuse and decay. Many have more recently been destroyed, either by the removal of machinery or by poorly considered conversion to other uses. Ideally, mills typical of their region or which, through their structure and machinery, illustrate features of historical or technical development, must be the prime candidates for protection and repair. Due mainly to limitations of ownership or finance, however, such a choice is not always available, so other considerations must apply. The aim of the Mills Section is therefore to fight for the conservation and repair of any mill which still retains its machinery.

In all repair work it is essential that a mill is not regarded merely as a building but as a machine. While the building often forms an integral part of the machine, it is the mill in its entirety – building and machinery – which is of importance. The true repair of any machine must be to working order, and the Section will pursue this ideal wherever feasible. Many degrees of repair are possible, however, and all are valid if they are undertaken with the primary aim of preserving mills as machines.

Mills worthy of protection, but which, through limitations of ownership or finance, cannot be repaired fully at the present time, must not be abandoned. Holding repairs can be undertaken,

often at modest cost, to conserve that which survives, by weatherproofing and preventing structural failure. Such repairs are vital if more mills are to survive intact. If carried out well, this work can lay the foundation for fuller repairs to be undertaken in the future, when conditions may change and proper support for the continued existence of a mill may be assured.

The aim of repair should be to retain and maintain as much as possible of the existing structure and machinery in order to preserve the historical and technical integrity of each mill. As a general rule, a mill should be repaired to the same appearance as when it last worked, a rule that applies as much to the interior as to the exterior. Ancillary machinery, engines and buildings, such as the miller's dwelling, kilns, granaries, cart sheds and other related outbuildings, even if comparatively modern, are all part of the history and development of milling and, where options allow, should be retained and repaired in a like manner, alongside the mills they served

Particular care should be taken to document each mill and site before the commencement and during the progress of the repair works. Original features that relate to the working of a mill should be kept in their correct context, irrespective of whether the mill is to function or not. Where replacement of any part is deemed necessary, such replacement should be carried out using appropriate and comparable materials and new parts should be faithful copies of the originals. Should no original part survive as a pattern, the design of new parts should be based on all available evidence, to be in keeping with local tradition and practice. Old parts removed and replaced are often worth preserving separately, as they may be of historical or technical interest.

Where mills are to work, it is vital to ensure that the machinery is set up to run as smoothly, efficiently and safely as possible. Effective maintenance must follow repairs and a working mill will require regular checks and running adjustments, preferably by a miller, millwright or capable custodian.

The removal of any item of machinery from a mill and the moving of a mill to a new site will normally be opposed by the Section, except where all attempts at on-site protection have failed and the building or machinery is threatened with certain destruction.

In order to function, windmills and watermills depend upon a close relationship with the natural sources of energy from which they derive their power. Ideally, therefore, the space around a windmill should be maintained as clear as possible of buildings and trees, to allow a free flow of wind. Similarly, an uninterrupted water supply is vital to work a waterwheel or water turbine. The maintenance of all watercourses, dams, weirs and ponds, with the provision of access for their repair and management, is therefore of particular concern to the Section.

Windmills and watermills are primarily machines, and proposals to convert them to other uses will always be critically examined by the Section. The SPAB was founded in 1877 by William Morris as a direct result of the contemporary spoiling of history, craftsmanship and true function that he witnessed being carried out as 'restoration'. The Mills Section bases its philosophy on more than 70 years' experience in the protection and repair of mills in many parts of the country, and aims to encourage the sincere and proper repair of mills, to ensure that truly representative examples will survive for future generations to study and enjoy. All such work will raise problems that can only be answered by those with adequate knowledge and experience. Such advice should be sought and considered carefully before any action concerning the future of any mill is taken.

The Mills Section Committee 1983 (revised 2000)

The above statement sets out the broad philosophy of the Section; more detailed and specific guidance on the historical technical and practical aspects of mill protection and repair is available from:

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