Results of Archaeological Works at

Felin Rhyd Hir, Efailnewydd, near Pwllheli



NGR SH 3455 3579

C.R Archaeology
Compiled by Catherine Rees
On Behalf of Mr Adrian Priest

Site Staff

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Excavation was conducted by Catherine Rees
Photographic survey was conducted by Adam Stanford of Aerial-Cam

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1.0 Introduction

Felin Rhyd Hir (NPRN 409208) is a watermill and miller's house with associated outbuildings lying adjacent to the B4415, approximately 0.6 km from the village of Efailnewydd (Figure 1). Currently the mill serves as the site residence and the miller's house is derelict. Planning permission is being sought to restore the miller's house and to return the main dwelling to this structure. Extension of this building is proposed to increase the available space. It is also proposed that the watermill be restored to working order and the building be divided into a holiday let and exhibition centre.

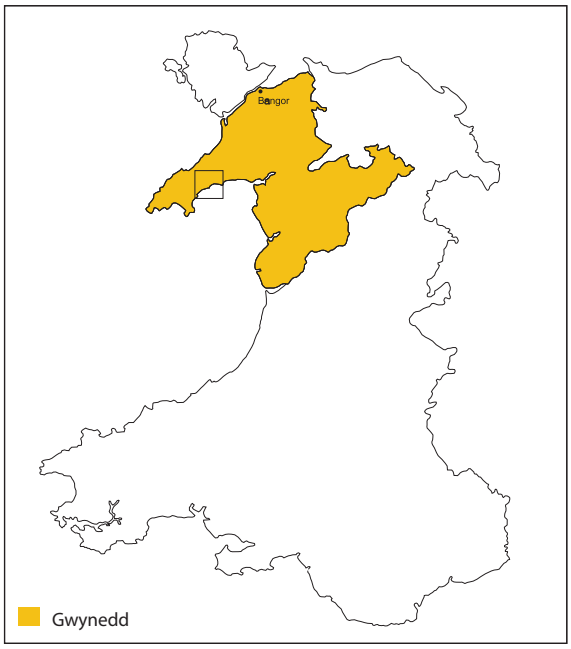
C.R Archaeology was instructed by Mr Priest of Felin Rhyd Hir to conduct pre-determination archaeological works at the above property in compliance with recommendations made by Gwynedd Archaeological Planning Services (Planning Application C11/11/66/40/LL).

A Project Design (Report number CR02-2012) was written following a discussion with Development Control Archaeologist Jenny Emmett of GAPS (March 2nd 2012) as a methodology for a programme of works relating to letter ref: 0228je01/D1643 (February 28th 2012).

Archival research was conducted and visits were made to Bangor University Archives, Caernarfon Record Office and the Gwynedd HER. Relevant papers were photocopied and have been incorporated into the finished report.

An evaluation trench measuring 5m x 7m was excavated to the top of the archaeological horizon within the footprint of the proposed extension to the east of the miller's house. This revealed a fragment of brick surface and the remains of a retaining wall removed in the 1960's. Excavation was undertaken from the 7th - 9th March 2012.

A photographic survey of the site was conducted by Adam Stanford of Aerial-Cam on the 9th March 2012.



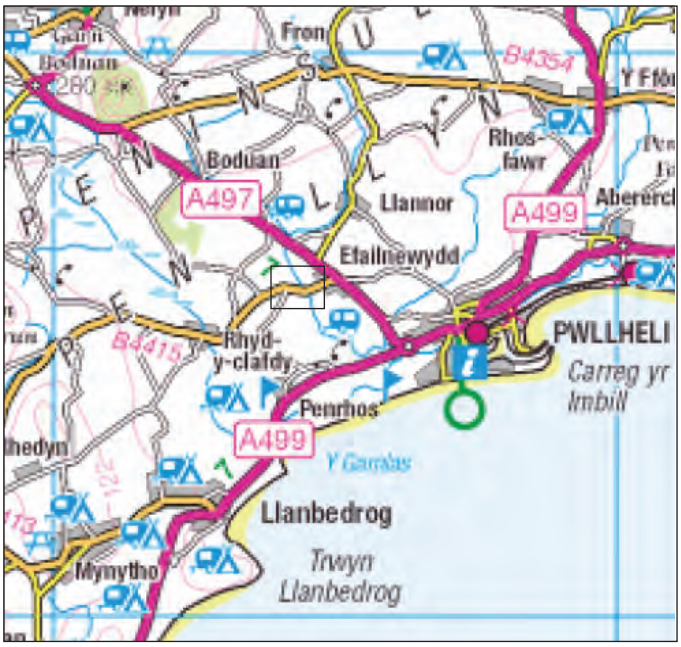




Figure 1. Felin Rhyd Hir Location Map (Source OS Open Data Mapping)

2.0 Project Aims

The programme of archaeological works conducted at Felin Rhyd Hir had three aims. The first aim was to collect, evaluate and interpret the information gathered through the various archaeological assessments, historical research and machinery recordings that have been conducted to date. This information was supplemented with a map progression, photographic illustrations and further archival research to form a coherent narrative history of the site.

Clarity was required in relation to some of the interpretations offered in certain documents. Of particular note were the suggestions that the mill and miller's house belong to two different building phases with the miller's house being the earlier of the two, the possibility that the original mill was situated where the miller's house now stands and the possible existence of an additional building between the dwelling and the mill.

The second aim was to uncover and record any archaeological remains surviving within the footprint of the proposed extension to the miller's house. Little was known as to how much damage modern services had done to this area. A small patch of possible cobbling which may be the remains of a yard surface was observed during a site visit and required evaluation.

The final aim of this archaeological investigation was to create a comprehensive photographic record of the site. This included the mill, miller's house, millpond and ancillary farm buildings.

3.0 Methodology

The archaeological scheme of investigation for Felin Rhyd Hir was three-fold and each element is detailed separately. All project elements were carried out in accordance with IFA *Standard and guidance* documents.

3.1 Supplementary Documentary Research

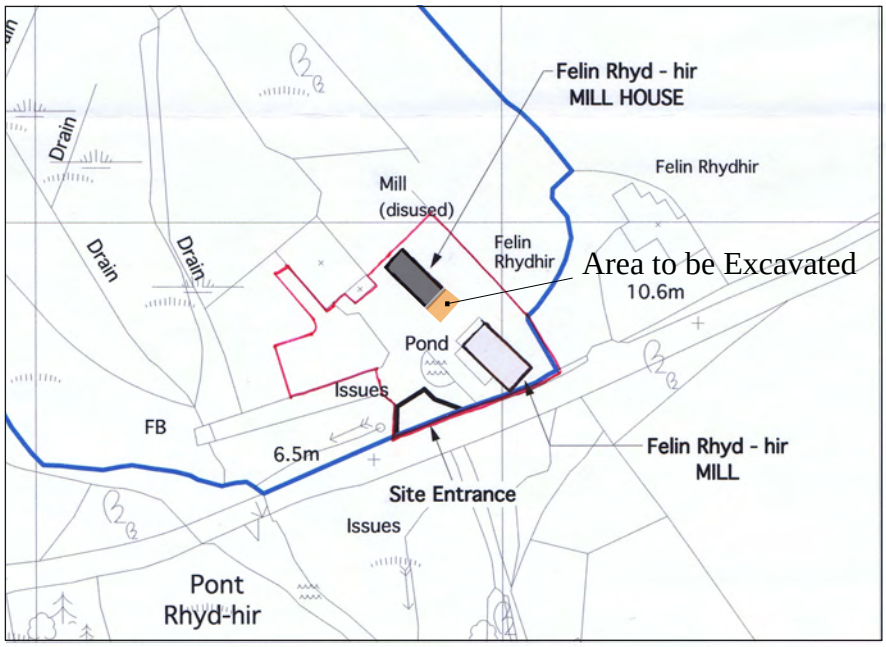
A complete and coherent history of the site was compiled utilising existing material gathered by Mr Priest in support of the Felin Rhyd Hir planning application. The information provided by the Welsh Mills Society was utilised and technical drawings (including the 3-d modelling) are reproduced and placed in context. The Welsh Mills Society were consulted and further details relating to the mill workings were provided by Mr John Crompton. Gaps in the historical record – in particular historic maps and information from the Gwynedd HER had been identified and the required material was sourced from Bangor and Caernarfon Record Offices. This data was examined with particular emphasis on determining the validity of suggestions relating to:

- The possibility that the mill and miller's house belong to two different phases with the miller's house being the earlier structure
- The possibility that the original mill was situated where the miller's house now stands
- The possibility that there was once an additional structure between the dwelling and the mill

3.2 Evaluation Trench

A two storey extension is proposed to the east of the miller's house. Concern had been expressed that there was a structure previously erected in this space and there was considered to be a high potential that archaeological remains related to the milling operations survived in this area. The level of survival of this material was unclear as there were known to be modern services in the area between the mill and the miller's house (Mr Priest pers com). It was therefore felt that a limited archaeological evaluation of this area was necessary.

Due to the limited ground cover over the proposed excavation area, and the likelihood of encountering modern services all excavation was carried out by hand. A trench measuring 5m x 7m was excavated to encompass the entire area within the proposed extension footprint (Figure 2). The trench was excavated to the top of the archaeological horizon.



Plan of Felin Rhyd Hir Site

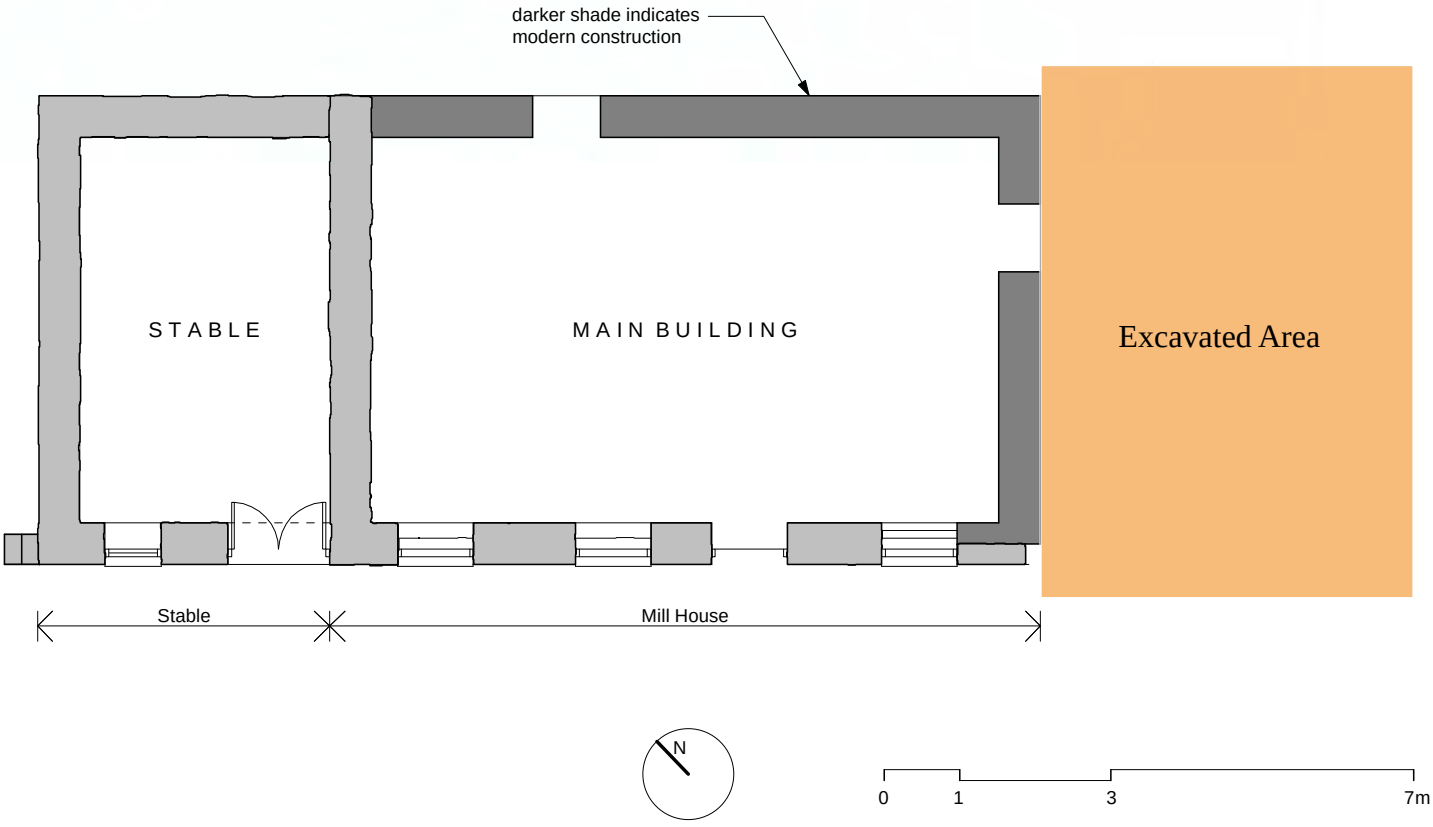


Figure 2. Plan of Site ShowingTrench Location
(Drawings Modified From Originals Produced by Alwyn Jones Architects)

Archaeological features, structures and remains identified during the course of the excavation were trowel cleaned by hand. Investigation of such structures or deposits was sufficient to determine their character, date, significance and quality. The purpose of this evaluation was to ascertain what remains of the archaeological material and to record it.

Following a site visit by Jenny Emmett of GAPS it was agreed that the archaeological remains uncovered during the evaluation would be preserved by record and did not require reburial or covering with geo-textile such as *Terram* (7th March 2012).

3.2.1 Recording

The record forms at C.R Archaeology are based on the English Heritage system and full written, graphic and photographic records were made in accordance with the English Heritage *Field Recording Manual*.

The written record comprised completed proforma context record sheets.

A trench plan was produced on gridded, archive standard stable polyester film at a scale of 1:20. Due to limited ground covering and the modern origins of the material it was not felt that it was necessary to draw the trench section. All drawings were numbered and listed in a drawing register, and these drawing numbers were cross-referenced to written site records.

A high-resolution 13mp Sony Alpha digital camera was used to create a photographic record of the site. This comprised of photographs of the archaeological structures. Included in each photograph was an appropriate scale, north arrow and a record board detailing the site name, number and context number. All photographic records were indexed and cross-referenced to written site records. Details concerning subject and direction of view were recorded in the site photographic register, indexed by frame number. Images from photography will be stored in a loss-less digital format in this case '*.TIF'.

A 'Harris matrix' diagram was constructed for the evaluation area.

3.3 Photographic Survey

A photographic survey of the Felin Rhyd Hir site was undertaken by professional photographer Adam Stanford of Aerial-Cam. This work consisted of:

- A photographic survey of the interior and exterior of the miller's house, mill and ancillary buildings
- Low level aerial photography of the site and surrounding area.

3.3.1 Equipment

The photographic survey of the exterior and interior of the miller's house, mill and ancillary buildings was undertaken using a 16 mega-pixel Nikon D7000 digital camera with a variety of standard and other lenses. Images were captured in RAW format for later processing into high resolution JPEG and TIF files.

To produce as full a record as possible the camera was mounted on three different apparatus: a vehicle mounted telescopic mast, a hand held telescopic mast and a tripod. The masts were erected to a maximum height of 22m.

All exterior elevations of the buildings within the mill complex were photographed from ground level. Additional photographs were taken detailing important architectural features. This record was supplemented with a series of photographs taken using telescopic masts. These photographs were taken to illustrate the landscape setting of the site and the relationships between the the buildings.

A record of the interior details of the mill house and ancillary buildings was created and a detailed record of the surviving machinery within the mill was compiled.

The methodology employed conforms to the requirements of photographic recording to the equivalent of a level 4 survey, as specified in Understanding Historic Buildings: A Guide to Good Recording Practice (English Heritage 2006 (c).

3.4 Health and Safety

A risk assessment was conducted prior to the commencement of works and site staff were familiarised with its contents. This applied to both the excavation and photographic survey elements of on site work. A first aid kit was located in the site vehicle.

3.5 Monitoring

Fieldwork was subject to monitoring by Gwynedd Archaeological Planning Services and a site visit was conducted on Wednesday 7th March.

3.6 Copyright

C.R Archaeology and all sub-contractors shall retain full copyright of any commissioned reports, tender documents or other project documents, under the Copyright, Designs and Patents Act 1988 with all rights reserved; excepting that it hereby provides a licence to the client and the local authority for the use of the report by the client and the local authority in all matters directly relating to the project as described in the Project.

3.7 Archive Compilation

All records created during the fieldwork will be checked for consistency and accuracy and will form part of the *Primary Site Archive (P1)* (EH 2006). The archive will contain all data collected, including records and other specialist materials. It will be ordered, indexed, adequately documented, internally consistent, secure, quantified, conforming to standards required by the archive repository and signposted appropriately to ensure future use in research, as detailed in the English Heritage *Management of Research Projects in the Historic Environment* (MoRPHE) methodology.

The archive will be assembled in accordance with the guidelines published in, *Standards in the museum care of archaeological collections* (Museums & Galleries Commission 1994), *Guidelines for the preparation of excavation archives for long-term storage* (United Kingdom Institute for Conservation, 1990) and *Archaeological Archives: A guide to best practice in creation, compilation, transfer and curation* (AAF 2007). The paper archive generated will initially be stored at the C.R Archaeology Office, Garth Road, Bangor and will be deposited at Bangor Museum within 6 months. The client Mr. Priest has requested that the artefactual material be returned to Felin Rhyd Hir and will be displayed in the proposed exhibition centre.

All materials contained within the *Primary Site Archive (P1)* that are subsequently identified by the *Assessment Report* (*P2)* as appropriate for analysis will be processed by suitable specialists and the resultant *Research Archive* (*P3)* will be checked and ordered according to *MoRPHE* criteria.

A summary of the excavation results will be published in the Council for British Archaeology (Wales) journal Archaeology in Wales.

4.0 Geographical and Geological Context

4.1 Topography

The site of Felin Rhyd Hir (Grid Reference SH 3455 3579) is located within the Parish of Llannor on the Llŷn Peninsular. The region predominantly comprises low-lying, agricultural land and is characterised by a pattern of dispersed farmsteads situated within irregular field systems defined by clawdd banks. This landscape is transected by rivers and streams and is crossed by important late eighteenth and early nineteenth century turnpike roads (www.heneb.co.uk).

The mill building is situated adjacent to the B4415, a minor road linking the A497 Pwllheli to Nefyn road at Efailnewydd with the B4413 Llanbedrog to Aberdaron road at Nanhoron. The Afon Rhyd Hir river runs along the southern site boundary and the mill water supply once drained into this water course.

4.2 Geology

The superficial geology of the site is described as “glaciofluvial deposits, Devensian – sand and gravel ” and the bedrock is detailed as “Nodglas formation – basaltic tuff and basaltic lava” forming part of the Ogwen Group which extends discontinuously from the coast of Cardigan Bay in the southwest to the Conwy area in the north (www.bgs.ac.uk).

5.0 Felin Rhyd Hir - Historical Background

The site of Felin Rhyd Hir lies within the *Lleyn and Bardsey Island Landscape of Outstanding Historic Significance*. The following is a quotation from the *Register of Landscape of Outstanding Historic Significance in Wales*:

> "*This extensive area, unlike many others in Wales, has few major monuments, few large extents of relict features, and little by way of an unifying historic theme such as, for example, the development of settlement or industrial patterns. Yet, it possesses a great and unparalleled wealth and diversity of, most often, smaller scale archaeological and historic features, which together form a cohesive and integrated whole, demonstrating both the continuity and the territorial unity of Lleyn from possibly prehistoric times onwards. There are archaeological sites ranging from the Mesolithic period to the recent past*".

A search covering the parish of Llannor was conducted at Gwynedd Historic Environment Record (HER) to ascertain as to whether any material specifically related to Felin Rhyd Hir or other local mill sites was held. This was found not to be the case. The search did however identify a number of sites of archaeological interest in the vicinity of the mill and these are listed below. It must be noted that, due to the limited scope of the excavation, this section is intended as a brief overview rather than a detailed synopsis of the locality.

5.1 Sites of Archaeological Interest in the Vicinity of Felin Rhyd Hir

PRN 430 Hut Platform and enclosure

PRN 431 Hut platform

PRN 432 Hut circle

PRN 433 Hut group

PRN 435 Hut group

PRN 2246 Single find spot, stone hammer Crymllyn Bach

PRN 2254 Ffynnon Gwynedd, Holy Well

PRN 2255 Ffynnon Gadfarch, Holy Well

PRN 2261 Platform House

PRN 2262 Ffynnon Cawdraf, Holy Well

PRN 2263 Single find spot, perforated stone near Penbryn Neuadd

PRN 2264 Holy Cross Church, Llannor

PRN 2269 Standing Stone

PRN 2275 Coin Hoard Cnut early 10th Century

5.2 An Introduction to Water Driven Corn Mills on the Llŷn Peninsular

Archaeological evidence has indicated that the use of water to turn wheels was developed in the eastern Mediterranean around the middle of the third century BC. The first documented description of the use of the water wheel to grind grain was provided by Roman engineer Vitruvius around 25 BC. The Romans are thought to have introduced the technology to Britain following their Invasion of AD 43 and a small number of Roman watermill sites have been recorded (Watts 2006: 4).

Following the withdrawal of the Roman Army in AD 410 evidence for the continued use of sophisticated machinery such as watermills is lacking, and it is not until the eighth century that a resurgence in their use can be attested. By the time of the compilation of the Domesday Book in 1086 over six thousand mills were operational in England although the extent of their use in Wales is less clear (Watts 2006: 5-7). There is abundant evidence for the use of water-driven corn mills in Ireland dating from the seventh century AD onwards (Gwyn 2007: 36).

Despite earlier evidence for the use of water mills in England and Ireland, and the agricultural potential of the area, rather surprisingly there is no demonstrable evidence of the use of water to grind corn in North-west Wales before the 13th Century and no explicit reference to the practice in Medieval Welsh Law (Gwyn 2007: 36). Following the conquest of Gwynedd in 1283 Edward I instructed his officials to prepare an exhaustive inventory of the lands now in the ownership of the crown. Within this document was mentioned a corn mill named *Deneio* where the inhabitants of Pwllheli were obliged to grind their corn in return for an annual payment of four crannocks (two quarters) of flour (Pierce 1941: 13). The Bodfel township, lying within the commote of Afloegion, is also listed as having its own mill and when the township was assessed in 1293 it was noted that oat, wheat and some barley was milled there (www.heneb.co.uk).

In the aftermath of the Anglo-Norman conquest watermills were established with great rapidity, initially around military installations but within a generation their use had spread out into the countryside (Gwyn 2007: 36). Every community was to have access to a mill - tenants of bond townships were required to send their grain to the Crown mills, whilst freeholders were able to own or hold shares in a mill. Both types of mill are recorded within the parish of Llannor, and Bodfel Mill which is later to be named Felin Rhyd Hir is recorded as a freehold mill. The locations of many of the medieval mills were in continuous usage well into the nineteenth century although the mills themselves were rebuilt and replaced over a considerable period of time (www.heneb.co.uk).

In his study of the industrialisation of Gwynedd David Gwyn states that the small rural corn mill was the most numerous and important monument type related to food production (Gwyn 2007: 127). Mr John Crompton of the Welsh Mills Society has conducted extensive research into the historical mills of the Llŷn Peninsula and through detailed analysis of the RCAHMW Database and historical map evidence has identified 43 mill sites. This demonstrates how widespread and commonplace the use of watermills was on the Llŷn as all but one of the sites identified was a water rather than a windmill (Crompton 2010).

Technological advances in the nineteenth century, in particular the widespread introduction of iron rollers, led to an increase in the yield and quality of flour and in 1878 Henry Simon established the first successful roller-mill plant manufacturing flour without the use of stones. By 1881 he had built the first fully automated milling plant for F.A Frost and Sons of Chester and from this time onwards roller milling was to slowly replace stone milling (Watts 1983: 8-10).

A distribution map produced by Mr Crompton details the current status of the watermills of the Llŷn Peninsula (Figure 3). The significance of the Felin Rhyd Hir watermill with its intact mechanism and millstones is clearly demonstrated when one views the poor survival rates for other corn mills within the local vicinity. This is further highlighted when one considers that, of the five sites shown as having significant remains, Felin Faesog was heavily restored in the early 1980's and is not original, one of the two wheels at Llechiddior is almost totally decayed and despite its listed status the mill at Aberdaron is in a poor state of repair (Crompton 2010).

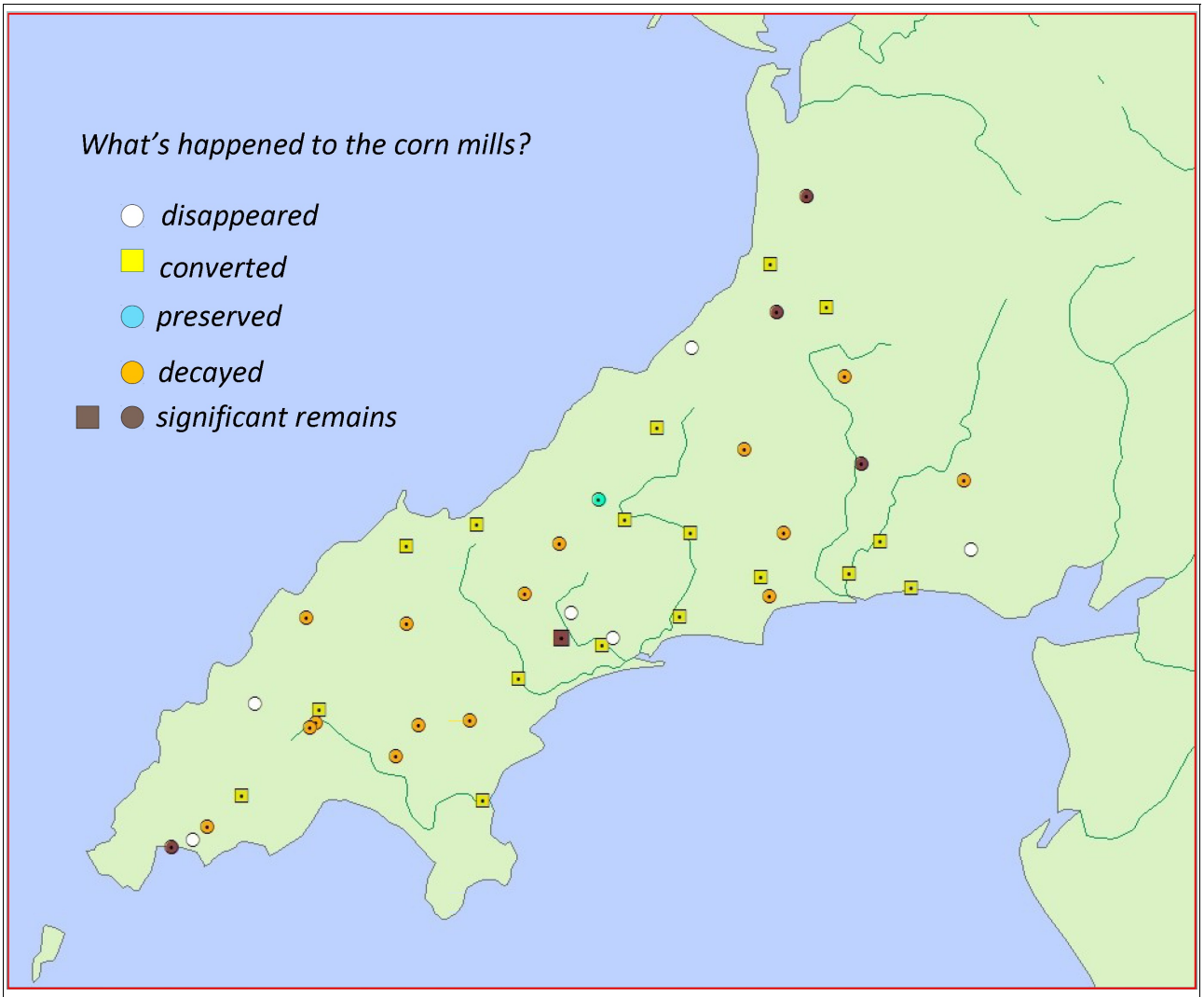


Figure 3. Distribution Map Showing the Location of Corn Mills on the Llŷn Peninsula Detailing the Current Status of Each Structure (Source: Crompton 2010 © Welsh Mills Society)

5.3 Felin Rhyd Hir Historical Background

The early history of Felin Rhyd Hir is little understood and somewhat fragmentary. Archive research conducted by Mr D. Whiteside Thomas of Caernarfon Record Office identified the original name of the mill as Melin Bodvel/Bodfel and as the name suggests the site was once part of the Bodfel Estate. A medieval mill named Bodfel[1] was listed and it is not unusual for a mill to be continuously located on one site, albeit in a heavily rebuilt and remodelled state so it is likely that this site has early origins (www.heneb.co.uk).

1 There are numerous permutations of the Bodfel name including Bodvel, Bodvell, Bodvill and Bodville. For ease of reading the spelling Bodfel will be used in all instances other than when quoting directly from a historical source

Much of the Bodfel Estate including the corn mill was sold by its Welsh owners in 1671 but unfortunately the documents relating to the properties owned by the original estate have been scattered and lost, making any detailed search of the early history of the mill impossible. It is interesting to note that a carved date-stone, presumably belonging to the Bodfel phase of the mill, was reused above the shaft of the waterwheel. The stone bears the inscription 1667 and is shown below (Figures 4). The stone itself is discussed in greater detail in a subsequent section.



Figure 4. 1667 Date Stone Located Above the Mill Wheelshaft

In his recent work John Williams examines the history of the Bodfel family and of particular interest to the above stone are the events surrounding the Civil War and its aftermath. During this period the family were divided by the conflict with the head of the family, John Bodfel, serving as a royalist colonel, whilst his estranged daughter Sarah was married to Lord Robert Robartes of Truro - the son of a parliamentarian soldier. Lord Robartes, who had retired from public affairs during the interregnum, had welcomed the eventual restoration of Charles II and was appointed Lord Privy Seal in 1661. John Bodfel and his daughter were reconciled during this period and the father wrote a will bequeathing his estate to Sarah's son Charles Bodville Robartes (Williams 2007: 52).

In 1663 a kinsman and former neighbour of John Bodfel, Thomas Wynne, persuaded the now infirm colonel to create a second will disinheriting his grandson and naming himself as the sole heir. A costly legal battle ensued during which Sarah, through her husband Robert, eventually secured an Act of Parliament to set aside the second will. This was finally secured at the end of 1666 in the

form of "*An Act for settling the Estate of John Bodvell Esquire deceased*" and the act received the Royal Assent in January 1667 (Williams 2007: 52). The year 1667 is therefore of great significance in the history of the Bodfel Estate and it would seem to be rather a coincidence that it is this date which is carved on the reused stone.

The victory for the family was short lived as the costs incurred fighting their case was to cause financial ruin and result in the sale of the estate. In 1669 John Cressett, the solicitor employed to challenge Thomas Wynne, brought a case against Robert Robartes for non-payment of debts. A bond of £5000 had been made against several large loans and as the money had not been repaid Cressett was forced to resort to the Court of Chancery for redress. The court found in his favour and a schedule was drawn up of lands whose total value would cover the debt and interest occurred (Williams 2007: 53).

The purchase deed for the transfer of ownership has not survived but other references have dated the transaction to May 30th 1671. In 1675 a reading was made in the House of Lords of "*An Act for vesting the Capital Messuage, or Mansion House, of Bodvile, and the Demesnes thereof, and drivers other Lands and Tenements and Hereitaments, in the County of Carnarvon and the Island of Anglesey, in Robert Stapilton Esquire and his Heirs, in Trust for John Cressett Gentleman and his Heirs forever*". This purchase was thought to be speculative as Bodfel was tenanted at this time. In 1684 the land, including the mill, was sold on to Samuel Hanson, a sugar planter from Barbados and a client of Cressett (Williams 2007: 53).

Caernarfon Records Office holds a rent roll for the year 1684 and this document names Mr. Robert Griffith as miller at Bodfel Mill. Griffith appears in two further years, in 1685 and later in 1687. By 1689 there has been a change of occupant and the miller is named as Thomas Edwards (Nanhoron Estate Records XD/101).

The next appearance of the Bodfel Estate mill in the historical record is in 1724. The grand-daughter of Samuel Hanson, Silence Hanson, inherited the Caernarfonshire element of the Hanson lands and on the marriage of her daughter, Elizabeth Folkes, these lands are mentioned in the settlement. The original document is held at the National Library of Wales Aberystwyth (Schedule of the Broom Hall MSS) and is records "*Settlement before the marriage of the said Sir Thomas Hamner and Elizabeth Folkes of a capital messuage with the demesne lands thereunto belonging called Bodvell house and demesne in Trefodvell in the parishes of Llannor and Bodvean and a*

water corn mill called Melin-Fodvell otherwise Melin Rylidrhir in Llannor aforesaid, all in co. Caernarvon".

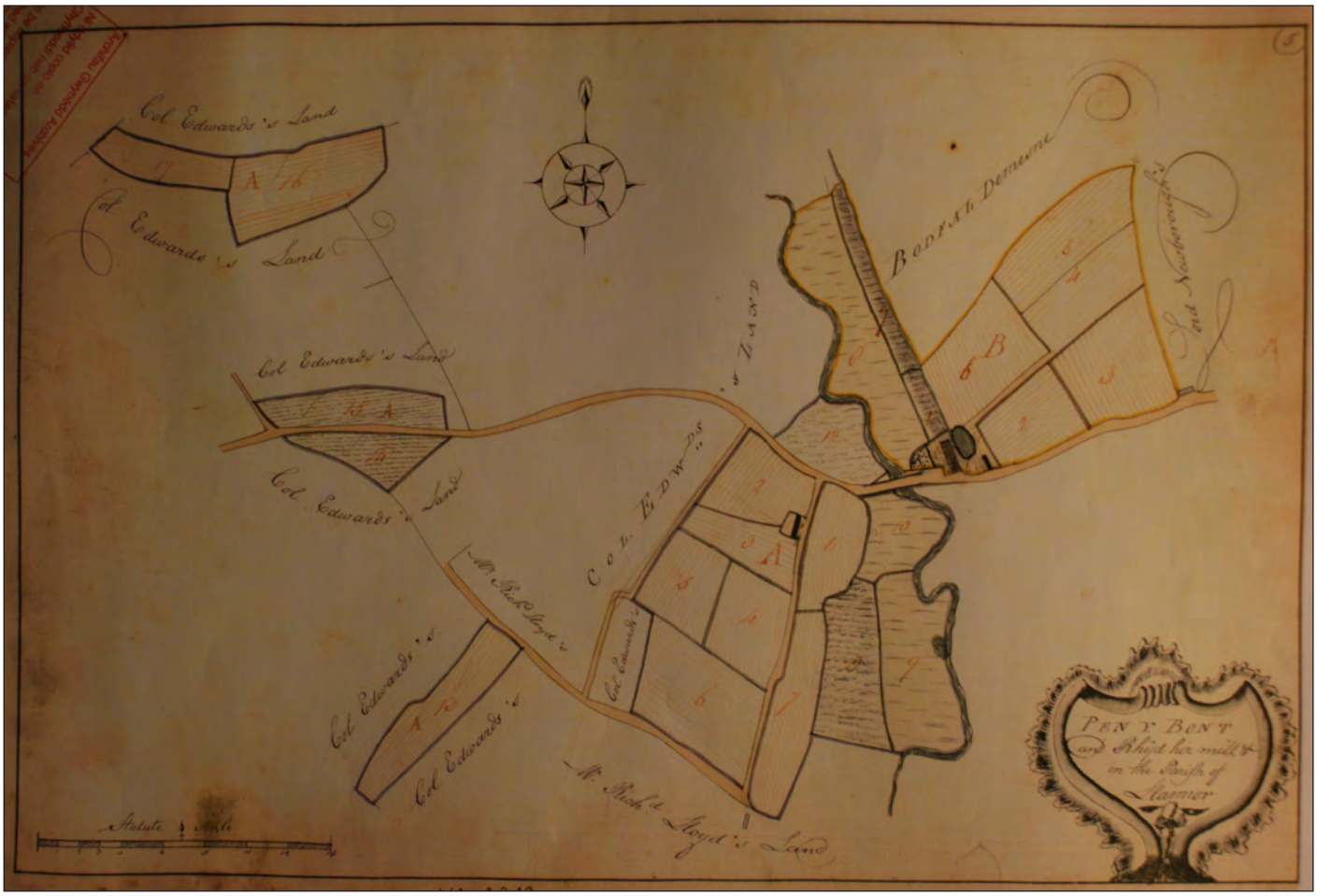
Despite the different spelling this is the first mention of the Bodfel mill also being known as Melin Rhyd Hir, presumably named after the Afon Rhyd Hir river located to the south of the mill and into which the mill water drains.

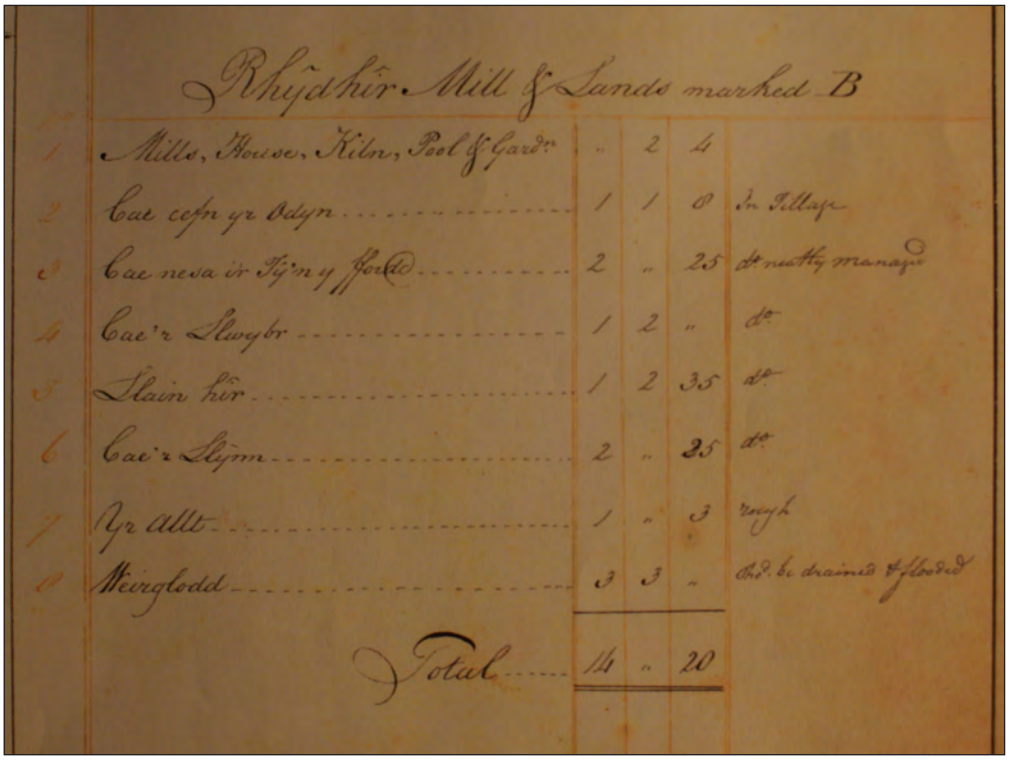
The marriage between Elizabeth and Thomas Hamner was not a success and it was rumoured that Elizabeth was involved in an affair with a man called Thomas Harvey. Elizabeth and Thomas Hamner eventually separated and Elizabeth retained a portion of her estates including the mill. On her death the land was bequeathed to Thomas Harvey and remained in the possession of the Harvey family until 1832 (Gwyn 2010: 1).

A map commissioned by the Harvey family in 1802 (Figure 5) shows a single large building covering the footprint of the present mill and miller's house. This map is however heavily stylised and the possibility that this is divided into two buildings at this early stage must not be discounted. When one examines the accompanying references paper (Figure 6) this hypothesis appears to gain support as the Rhyd Hir Mill plot is detailed as Mills, House, Kiln, Pool & Gardens.

A further document which supports a late eighteenth century date for the buildings is an undated document (Caernarforn Record Office: Vaynol 4215). The paper is believed to belong to the late eighteenth century and in the section relating to "*Rhyd Hir and Mill"* it states *"We have not put any value on the mill and house, as we understood the miller agreed to pay interest for the money Mr. Harvey laid out*". Once more the mill and house are described as separate buildings and it is possible that the outlay of money to which the document refers was the cost of rebuilding the mill and house in its present form.

In his analysis of the Felin Rhyd Hir complex David Gwyn concludes that "*on purely archaeological evidence (building style, building materials, ironwork, etc.), the two main structures appear to be industrial features of early to mid-19th century date, and to represent a substantial estate investment of this period*" but concedes that it is difficult to reconcile this evidence with the 1802 Harvey Map which shows the mill building on the same footprint as the current buildings. He remarks that although this date would be early the possibility cannot be discounted (Gwyn 2010: 3).





Rhŷd hîr Mill & Lands marked B

1	Mills, Houses, Kiln, Pool & Gard^{n}	..	2	4	
2	Cae cefn yr Odyn	1	1	0	in Tillage
3	Cae nesa ir Ty'n y Ffordd	2	..	25	do neatly manag^{d}
4	Cae'r Llwybr	1	2	..	do
5	Llain hîr	1	2	35	do
6	Cae'r Llŷn	2	..	25	do
7	Yr allt	1	..	3	rough
8	Weirglodd	3	3	..	Bad to be drained & flooded
	Total	14	..	20	

Figure 5. (Above) 1802 Map of Pen Y Bont and Rhyd Hir Mill in the Parish of Llannor. Commissioned by the Harvey Family (Source Caernarfon Record Office Vaynol Collection)

Figure 6. (Left) Particulars Relating to the Harvey Map. It is Clear That Even At This Early Date the Mill Has a Separate Millers House and Kiln Structure And it is Likely That a Stylised Version of the Current Mill is Depicted

An examination of events taking place on the Llŷn Peninsular around the turn of the nineteenth century has shown that it was a time of great change. Pont Rhyd Hir, the bridge spanning the Afon Rhyd Hir to the south of the mill, was rebuilt in 1780 and it was during this period that great improvements in the road systems were being made (www.coflein.gov.uk).

Prior to 1750 land travel within the Llŷn was difficult and there were few roads capable of supporting journeys, particularly using wheeled vehicles, over any great distance. Many routes were drovers roads along which cattle reared on the Llŷn were driven to market in England and Efailnewydd, near Felin Rhyd Hir, was a collecting point along this route. Roadside smithies where the animals would be shod to protect their feet for their long journeys were in operation here (www.heneb.co.uk). The 1780 investment in the Pont Rhyd Hir bridge demonstrates that the usage of the drovers road running alongside the mill (now the B4415) was high enough to warrant the monies spent. An improvement in the crossing place would also suggest an improvement in the road itself, making access to the Rhyd Hir mill easier and potentially increasing the trade.

The Industrial Revolution was gathering momentum and the increasing populations in the growing centres of industry were placing high demand on foodstuffs. From 1750 price increases allowed affluent landowners and farmers to invest surplus capital in agricultural improvements (Evans 2011: 1) which could increase production levels. At a time of high prices for flour, the remodelling of the mill to increase productivity would have been a shrewd investment for the land owner.

There is evidence for considerable investment in the mills and milling of Caernarfonshire in the period around 1800. Although the Felin Rhyd Hir mill was not at this point part of the Vaynol Estate, examination of the Vaynol records demonstrates that enterprising landowners in neighbouring areas were speculating heavily in new equipment during this relatively early period. In his comprehensive synopsis of a survey of the Vaynol lands conducted around 1800 R. Roberts identified a number of references to corn mills, including mentions of newly installed milling machinery, millstones, drying kilns, millponds and eisingrug or winnowing banks (Roberts 1973: 18). Having considered all available evidence it would seem highly probable that the mill and miller's house currently standing at Felin Rhyd Hir were built during the late eighteenth century.

Research undertaken by Mr. D.W Thomas of Caernarfon Record office revealed that the Bodfel Estate was sold by William Harvey in 1832, and ownership passed to Thomas Assheton Smith of Vaynol, Bangor. In 1833 the Vaynol Estate papers record a rent of £71 being paid for the mill.

On the 1841 Tithe Map for Felin Rhyd Hir (Figure 7) we see the first definitive cartographic evidence for the separate mill and miller's house building in the form we see today. This information can be supplemented with information from the UK Census (1841) which tells us that the mill was inhabited by William Francis (age 70) whose occupation was listed as miller and his daughters Margaret (40) and Jane (35) who were presumably spinsters. Also resident at the property were Elizabeth (45) and Ellen (15) Williams, whose occupation or relation to the family is not listed, and three male servants, John Roberts (15), William Roberts (15) and Robert Williams (12). The census extract is included as Figure 8.

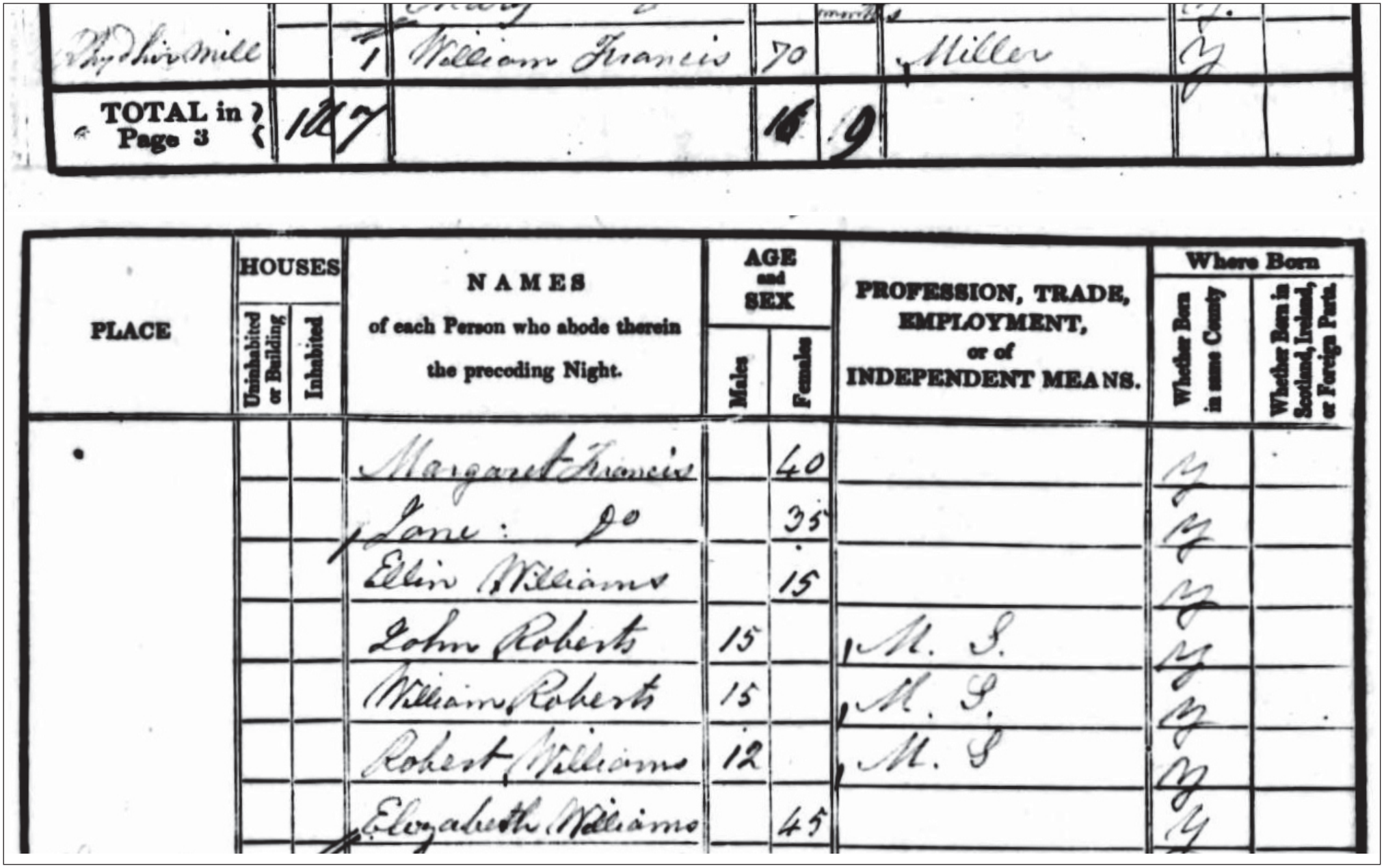
The family are still resident at Felin Rhyd Hir in 1851 as is recorded once more in the census return. A little more detail is contained within this form and we are able to see that Ellen Williams is the granddaughter of William Francis and her occupation is dressmaker. This could imply that the Elizabeth Williams listed in the 1841 census could have been her mother, and a daughter of William Francis. She is not listed in 1851 and may be deceased by this point. Both Margaret and Jane Francis are still living in the mill and their respective occupations are listed as housekeeper and working in the house. Jane has now married Thomas Williams (46) who is listed as “son in law” and John Elias (15) is listed as a servant, whilst the nephew of William Francis, an Owen Roberts (62) is listed as a miller (Figure 9).

The census return for 1861 was not found and by 1871 the Jones family Thomas (79), Mary (71) and their children Harry (28) and Mary (25) are working the mill and 16 acres of land surrounding the mill. In contrast to earlier years there are no servants listed as living in the mill (Figure 10). By 1881 the Jones family had left Rhyd Hir and the mill was being run by Richard Williams (40) who is listed as a farmer and miller employing 3 men and one boy. Also resident are his wife Elizabeth (34) and mother Jane Davies (72) a widow. One male servant Richard Jones (15) is listed as the mill porter (Figure 11).

The first edition Ordnance Survey Map for the Llŷn Peninsular was produced in 1887 (Figure 12). Felin Rhyd Hir can be seen to have undergone a number of alterations since the 1841 Tithe Map. Additional outbuildings have been added that survive to this day, although the exact date of their erection can not be determined. The barn and outside kitchen have been built and the stable has been added to the north-west of the miller's house. An additional structure has been added to the south-east of the miller's house which does not survive. The linear extensions to the miller's house were necessary as the house and mill were built into a bank allowing no space to extend to the rear.

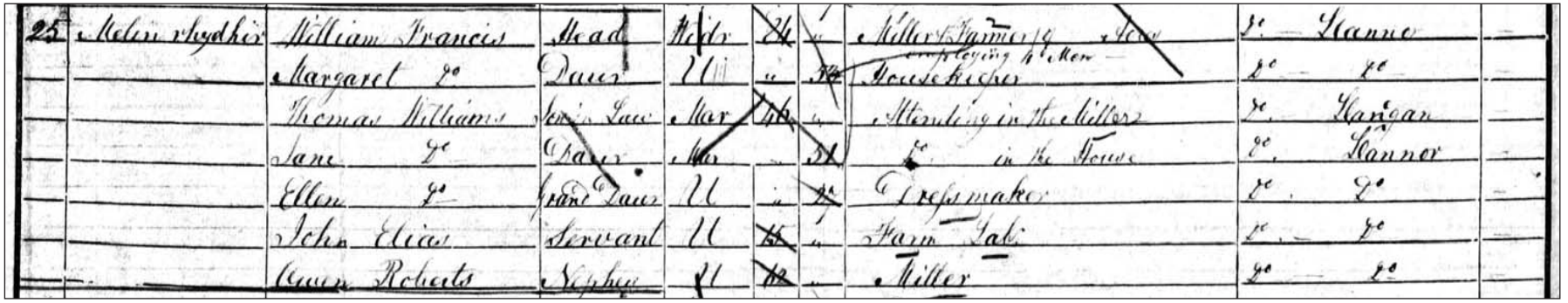


Figure 7. 1841 Tithe Map Extract. Note the Mill Pond and Lenght of Mill Race. Due to the Poor Quality of the Image the Mill and Millers House Have Been Defined in Black.



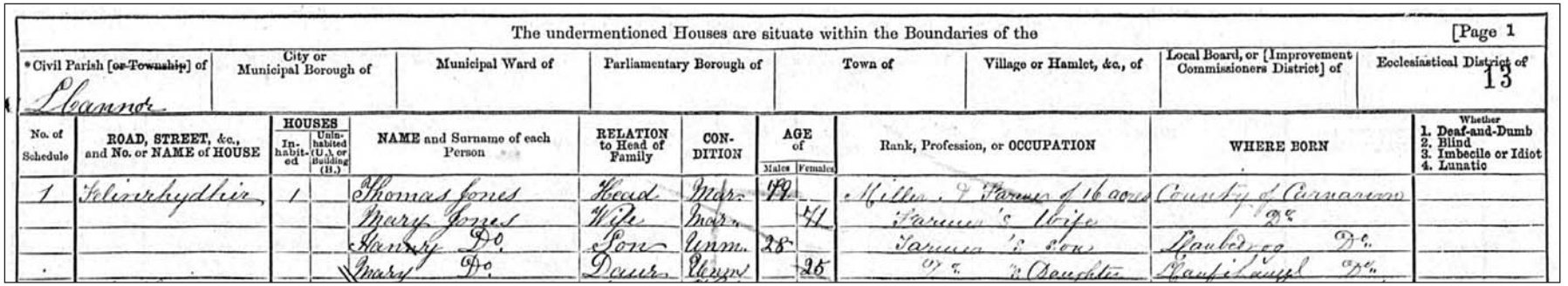
PLACE	HOUSES Uninhabited or Building	HOUSES Inhabited	NAMES of each Person who abode therein the preceding Night.	AGE and SEX Males	AGE and SEX Females	PROFESSION, TRADE, EMPLOYMENT, or of INDEPENDENT MEANS.	Where Born: Whether Born in same County	Where Born: Whether Born in Scotland, Ireland, or Foreign Parts
Rhydhirmill		1	William Francis	70		Miller	Y	
TOTAL in Page 3	1	7		16	9		Y	
			Margaret Francis		40		Y	
			Jane: Do		35		Y	
			Elin Williams		15		Y	
			John Roberts	15		M. S.	Y	
			William Roberts	15		M. S.	Y	
			Robert Williams	12		M. S	Y	
			Elizabeth Williams		45		Y	

Figure 8. 1841 UK Census Extract for Felin Rhyd Hir, Llannor Parish



25	Melin rhydhir	William Francis	Head	Widr	24		Miller & Farmer of 4 Acres employing 4 Men	Do. Llanno	
		Margaret Do	Daur	U	"	34	Housekeeper	Do. Do	
		Thomas Williams	Son in Law	Mar	46	"	Attending in the Millers	Do. Llangan	
		Jane Do	Daur	Mar	"	51	Do. in the House	Do. Llannor	
		Ellen Do	Grand Daur	U	"	2	Dressmaker	Do. Do	
		John Elias	Servant	U	15	"	Farm Lab.	Do. Do	
		Owen Roberts	Nephew	U	12	"	Miller	Do. Do	

Figure 9. 1851 UK Census Extract for Felin Rhyd Hir, Llannor Parish

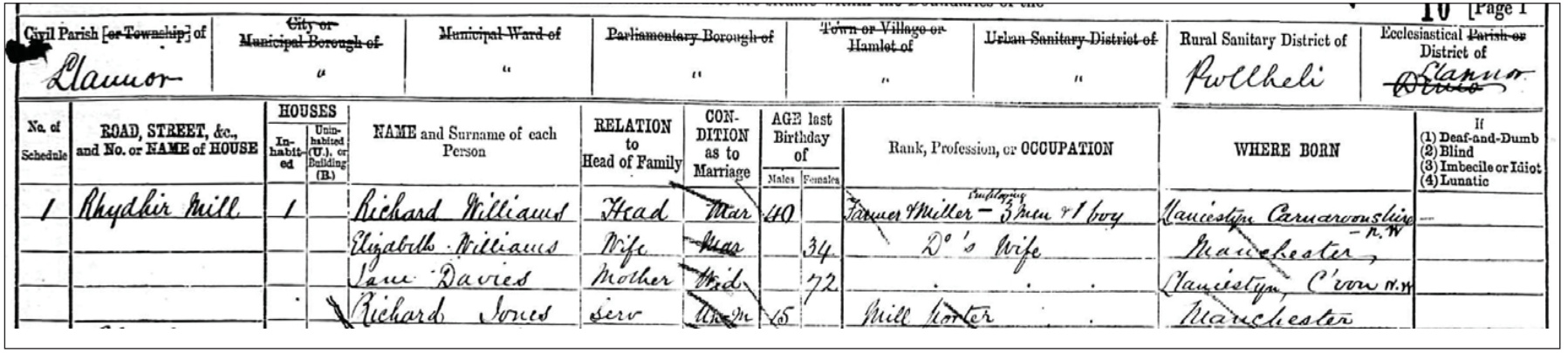


The undermentioned Houses are situate within the Boundaries of the [Page 1

Civil Parish [~~or Township~~] of	City or Municipal Borough of	Municipal Ward of	Parliamentary Borough of	Town of	Village or Hamlet, &c., of	Local Board, or [Improvement Commissioners District] of	Ecclesiastical District of
Llannor							13

No. of Schedule	ROAD, STREET, &c., and No. or NAME of HOUSE	HOUSES Inhabited	HOUSES Uninhabited (U.), or Building (B.)	NAME and Surname of each Person	RELATION to Head of Family	CONDITION	AGE of Males	AGE of Females	Rank, Profession, or OCCUPATION	WHERE BORN	Whether 1. Deaf-and-Dumb 2. Blind 3. Imbecile or Idiot 4. Lunatic
1	Felinrhydhir	1		Thomas Jones	Head	Mar.	79		Miller & Farmer of 16 acres	County of Carnarvon	
				Mary Jones	Wife	Mar.		71	Farmer's Wife	Do.	
				Hanry Do.	Son	Unm.	28		Farmer's Son	Llanbedrog Do.	
				Mary Do.	Daur	Unm.		25	Do. Daughter	Llanfihangel Do.	

Figure 10. 1871 UK Census Extract for Felin Rhyd Hir, Llannor Parish



10 [Page 1

Civil Parish [~~or Township~~] of	~~City or Municipal Borough of~~	~~Municipal Ward of~~	~~Parliamentary Borough of~~	~~Town or Village or Hamlet of~~	~~Urban Sanitary District of~~	Rural Sanitary District of	Ecclesiastical ~~Parish or~~ District of
Llannor	"	"	"	"	"	Pwllheli	Llannor

No. of Schedule	ROAD, STREET, &c., and No. or NAME of HOUSE	HOUSES Inhabited	HOUSES Uninhabited (U.), or Building (B.)	NAME and Surname of each Person	RELATION to Head of Family	CONDITION as to Marriage	AGE last Birthday of Males	AGE last Birthday of Females	Rank, Profession, or OCCUPATION	WHERE BORN	If (1) Deaf-and-Dumb (2) Blind (3) Imbecile or Idiot (4) Lunatic
1	Rhydhir Mill	1		Richard Williams	Head	Mar	40		Farmer & Miller employing 3 men & 1 boy	Llaniestyn Carnarvonshire N.W.	
				Elizabeth Williams	Wife	Mar		34	Do's Wife	Manchester	
				Jane Davies	Mother	Wid		72		Llaniestyn, C'von N.W.	
				Richard Jones	Serv	Unm	15		Mill Porter	Manchester	

Figure 11. 1881 UK Census Extract for Felin Rhyd Hir, Llannor Parish

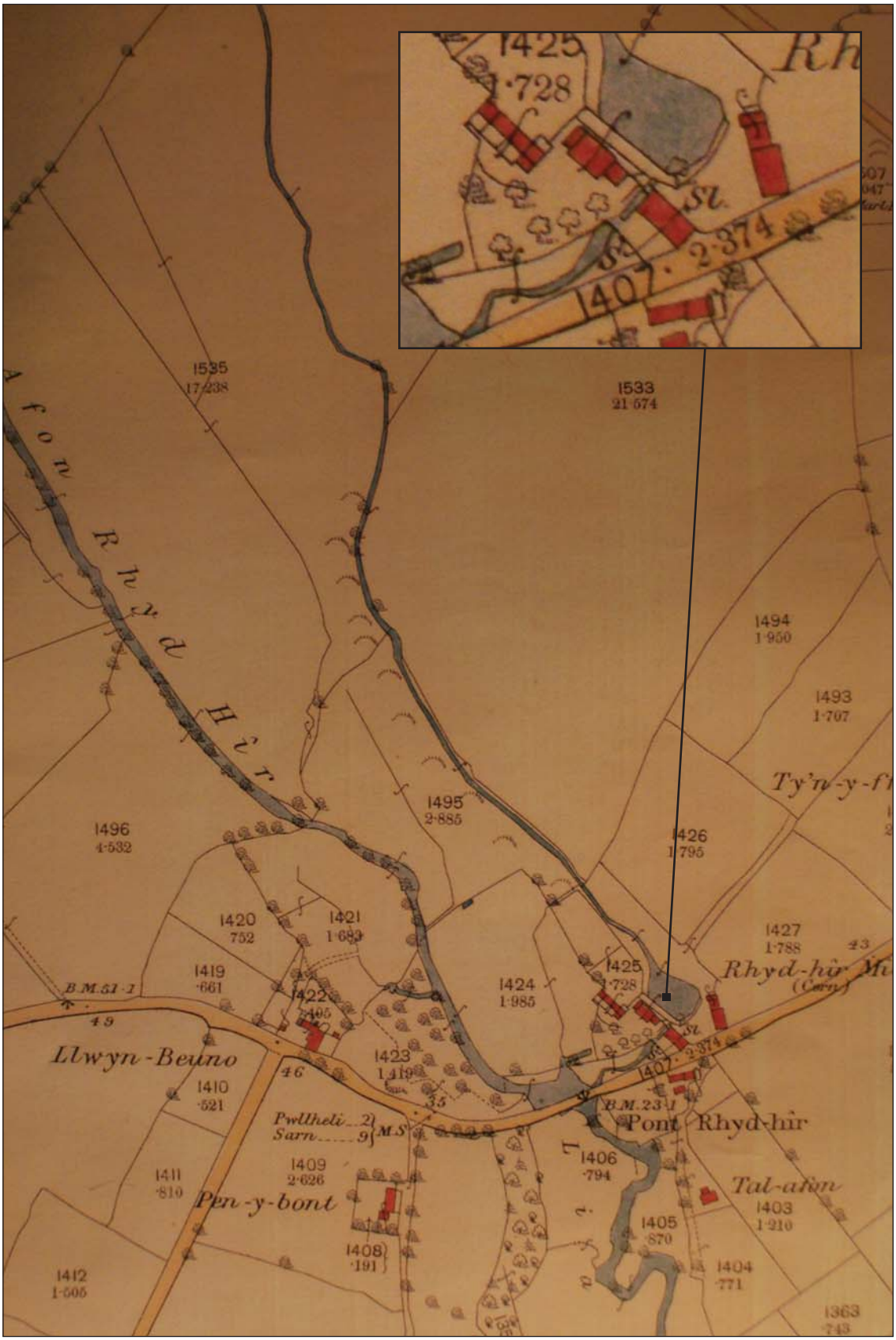


Figure 12. First Edition Ordnance Survey Map Extract 1887 Showing South-East Extension of Millers House

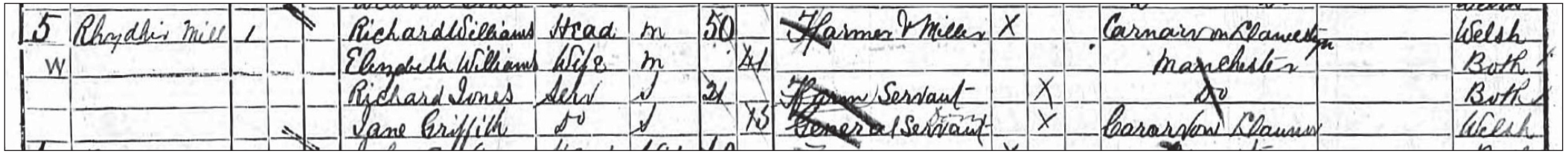
The 1891 census (Figure 13) lists Richard and Elizabeth Williams as continuing to occupy the property. Two servants are listed – Richard Jones (21) a "farm servant" and Jane Griffith (15) a general servant. It is quite possible that, despite a discrepancy between the ages, Richard was also the servant listed as a mill porter in the previous census, given that they are both listed as being born in Manchester.

In the 1901 census (Figure 14) Richard and Elizabeth as still resident at Rhyd Hir, although Elizabeth is listed as Ann E Williams. The place of birth and age are consistent with previous entries and it is almost certainly the same person. Richard Jones is also still resident at the mill and in this instance is listed as the nephew. The occupation of Richard Williams is listed as farmer, whilst Richard Jones is now the miller.

The Second Edition Ordnance Survey map dated 1901 (Figure 15) shows a possible further improvement to the Rhyd Hir mill complex. There appears to have been a further small structure added in the gap between the miller's house and the mill. It is positioned to the south-east of the previous extension, once more maintaining the linear arrangement of buildings due to the existence of the bank retaining the mill pond.

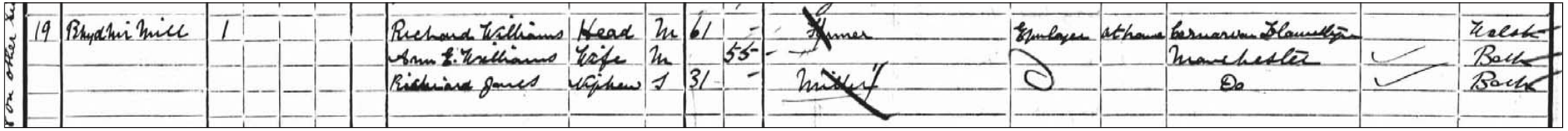
Felin Rhyd Hir was sold at auction on the 23rd October 1907 at Pwllhelli Town Hall and the auctioneer's catalogue is retained at Caernarfon Record Office. The section detailing Felin Rhyd Hir is included as Figure 16. This document shows that Mr Richard Williams is still the tenant at the mill. This document also provides useful information about the buildings around the mill and of particular interest is the mention in the notes section that the zinc churning shed, the hen house, the wooden and zinc hay shed, the water power (for churning) and the belting in the mill all belong to the tenant and were not to be included in the sale.

This is of particular relevance when we compare the 1901 OS map with the third edition OS map printed in 1917 (Figure 17). This map shows that the buildings erected between the miller's house and the mill have now been removed. It is possible that these structures were the zinc churning shed referred to in the 1907 auction catalogue. This is supported by the statement that water power was used for churning, and it would therefore seem likely that such an activity would be based near the waterwheel. Their removal would coincide with the change of tenant at the property as the 1911 census (Figure 18) shows a new family is now in residence.



5	Rhydhir Mill	1		Richard Williams	Head	m	50		Farmer & Miller	X			Carnarvon Llanwnda		Welsh
W				Elizabeth Williams	Wife	m		41					Manchester		Both
				Richard Jones	Servt	s	21		Farm Servant		X		Do		Both
				Jane Griffith	Do	s		75	General Servant		X		Carnarvon Llanwnda		Welsh

Figure 13. 1891 UK Census Extract for Felin Rhyd Hir, Llannor Parish



19	Rhydhir Mill	1			Richard Williams	Head	M	61	-	Farmer	Employer	at home	Carnarvon Llanwnda		Welsh
					Ann E. Williams	Wife	M		55 -				Manchester	✓	Both
					Richard Jones	Nephew	S	31	-	Miller			Do	✓	Both

Figure 14. 1901 UK Census Extract for Felin Rhyd Hir, Llannor Parish



Figure 15. Second Edition Ordnance Survey Map Extract 1901 Showing Further South-East Extension to Millers House. As an Interesting Note this Map Clearly Shows a Black Block Corresponding With the Position of the Brick Surface Uncovered During Excavation

Lot 36.

Rhyd Hir Mill

(CORN).

In the occupation of Mr. Richard Williams, as yearly tenant.

1631 1633a	Rhyd Hir Mill, House, Outbuildings, Yard, Pen-top, Mill Pond, Garden, Lane, etc.	1	3	14
1632	Werglodd Dan Ty	1	3	38
1543	Werglodd Bellaf and part of the Mill Race	2	3	22
1544	Cae Tu Cefn y Llyn	1	3	7
1545	Llain Hir	1	3	32
1546	Cae Bach	1	2	33
1547	Cae Tyn y Ffordd	2	2	5
1626	Cae'r Odyn	1	3	6
				16 1 37

THE HOUSE is small, and contains:—A Parlour, Kitchen, Back Kitchen and Four Small Bedrooms, also an Outside Kitchen with a Boiler therein.

THE OUTBUILDINGS comprise:—A Cowhouse with four ties, a Calves' place, Barn, Two-stalled Stable, Four Pigstyes, Kiln (with Loft above), and the Mill which adjoins.

The Water Power is an excellent one at all times, and a good business in the grist trade is carried on, and no doubt other undertakings which need a strong power could with advantage be established here.

:— NOTES. —:

(a). The Waterwheel, Machinery, and two pairs of Stones are included in the Sale, but the zinc Churning Shed, the Hen House, the wooden and zinc Hay Shed, the Water Power (for Churning), and the Belting in the Mill which belong to the tenant are not included in the Sale.

(b) This Lot is sold with the benefit of the Right of the Mill Race being secured for the use of the Mill, together with the right of access to same and to the Weir and Sluice at all reasonable times for the purpose of inspecting and repairing same in Lots 31, 33, 34 and 35, and the Purchaser shall be deemed to be cognizant of such rights.

(c) The purchaser of this Lot must covenant to keep in thorough repair at all times at his own expense the said Weir, Sluice, and Mill Race, and he buys subject to his being responsible for any damage which may be caused by the neglect of himself or his servants to the owners and occupiers of Lots 31, 33, 34 and 35, and must enter into covenants to that effect with the Purchasers of Lots 31, 33, 34 and 35 respectively as to keeping in repair and making good damage.

Carried forward ... 743 3 19

Figure 16. Felin Rhyd Hir 1907 Auction Particulars. See Notes Section for Details Relating to Temporary Buildings Owned by the Tenant Mr. Williams and Water Power for Churning



Figure 17. Third Edition Ordnance Survey Map Extract 1917 Showing Removal of South-East Extensions to Miller's House

The 1911 census lists the mill occupants as Griffith Thomas Evans (41), his wife Winifred (38) and their infant son Hywel Eifion (1). Two servants Griffith Hughes, a horseman and farm labourer, and Elizabeth Thomas, a domestic servant, are also in residence.

Twentieth century records for the mill are more difficult to access as documents such as the census are sealed for 100 years. The following section is therefore pieced together from local memories, biographies and family members.

An undated picture of the mill and miller's house (Figure 19) in the possession of the current owner may date from or depict the mill in operation around 1920 – 30. Felin Rhyd Hir was thought to have stopped being used as a corn mill around the 1920's but during a recent open day at the mill an elderly local resident remembered the mill as operational until 1954 (Adrian Priest pers com). This would seem a very late date but the use of watermills, particularly those involved in the production of animal feed, did continue in certain instances until after the Second World War (Watts 1983).

The windows in the miller's house were raised and the glass and frames replaced around the 1930's when the ground floor of the building was converted to stabling. The ground floor fireplaces in the building were blocked up. The first floor and loft space continued to be used as accommodation. The first floor was laid out as a parlour containing a table and chairs whilst the loft space contained beds. This arrangement was remembered by the current owner as having been maintained until his father took ownership of the property.

The mill had a famous Welsh resident during the later 1950's and was home to singer Margaret Hughes (Roberts) also known as Leila Megane (1891-1960). Mrs Hughes died suddenly at her home in the mill house in 1960 (National Library of Wales).

Around 1960 the bank at the rear of the mill and miller's house was removed down to ground level, presumably in an attempt to introduce more light into the buildings and to help against the damp (Mr Priest pers com). This event was however unfortunate as it had a destabilising effect on the buildings since they were built directly onto the ground without any footings.

In 1970 the Felin Rhyd Hir site was bought by Mr Kenneth Priest, the father of the current site owner. Mr Priest set about restoring the mill for habitation and made a number of changes in the 1970's and 80's including adding skylights and a porch to the building. Mr Priest was incredibly

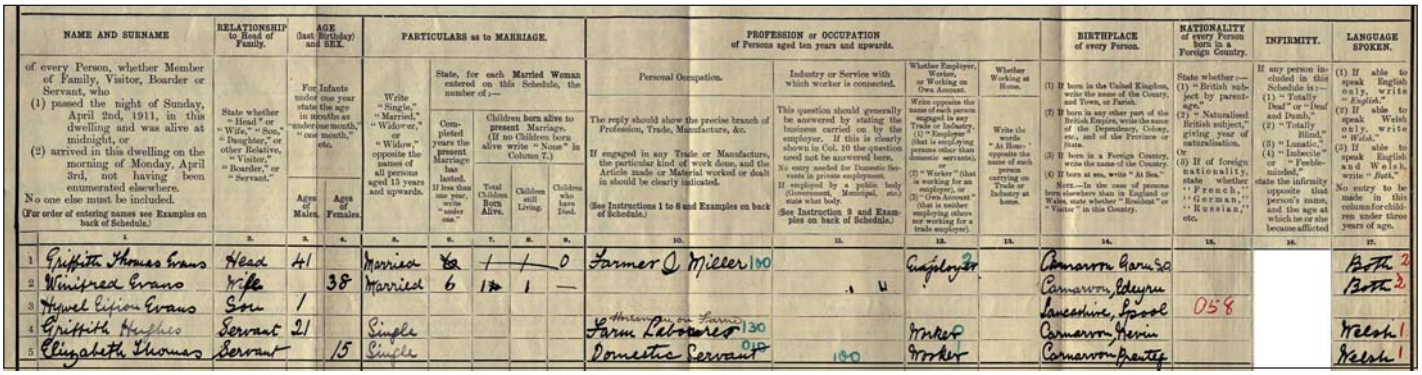
aware of the importance of the mill machinery and, unlike in so many conversions, this was left intact. The working were essentially hidden behind a dividing wall created by the boarding of the hurst frame in the lounge area. The wooden trough and spouts for collecting the flour have also survived. The upstairs of the mill is built around the fittings and the wooden divisions could be removed with relative ease to restore the former appearance of the mill.

The kiln area of the house was converted into a kitchen downstairs and a bathroom and bedroom upstairs. Little of the original kiln structure has survived apart from the ceiling vent which has been restored.

On July the 19th 1984 the Llŷn Peninsula was the epicentre of an earthquake measuring 5.4 on the Richter Scale (www.earthquakes.bgs.ac.uk). The miller's house was badly damaged by this event as it had been destabilised by the removal of the bank to the rear of the building. Figures 20-27 show the miller's house and surrounding area in the years following the earthquake and document its slow deterioration.

The house existed as a two/three storey structure until 2010 when the building had become so unsafe that Mr Priest was forced to take down the loft and first floor level of the house. All stone was retained, as were the roof slates, and it is intended that the original materials will be used in the restoration.

Since inheriting the site Mr Adrian Priest and family have been working to restore the miller's house and mill to their former glory and to date work has already begun on restoring the waterwheel. It is hoped that planning permission will be granted and that the mill will once more become operational. It will form an exhibition centre whilst the old kiln area will be utilised as a holiday let to generate an income for the maintenance of the mill. The family residence will be returned to its original place in the miller's house.



	NAME AND SURNAME of every Person, whether Member of Family, Visitor, Boarder or Servant, who (1) passed the night of Sunday, April 2nd, 1911, in this dwelling and was alive at midnight, or (2) arrived in this dwelling on the morning of Monday, April 3rd, not having been enumerated elsewhere. No one else must be included. (For order of entering names see Examples on back of Schedule.)	RELATIONSHIP to Head of Family. State whether "Head" or "Wife," "Son," "Daughter," or other Relative, "Visitor," "Boarder," or "Servant."	AGE (last Birthday) and SEX. For Infants under one year state the age in months as "under one month," "one month," etc. Ages of Males.	Ages of Females.	PARTICULARS as to MARRIAGE. Write "Single," "Married," "Widower," or "Widow," opposite the names of all persons aged 15 years and upwards.	State, for each Married Woman entered on this Schedule, the number of:— Completed years the present Marriage has lasted. If less than one year, write "under one."	Children born alive to present Marriage. (If no Children born alive write "None" in Column 7.) Total Children Born Alive.	Children still Living.	Children who have Died.	PROFESSION or OCCUPATION of Persons aged ten years and upwards. Personal Occupation. The reply should show the precise branch of Profession, Trade, Manufacture, &c. If engaged in any Trade or Manufacture, the particular kind of work done, and the Article made or Material worked or dealt in should be clearly indicated. (See Instructions 1 to 8 and Examples on back of Schedule.)	Industry or Service with which worker is connected. This question should generally be answered by stating the business carried on by the employer. If this is clearly shown in Col. 10 the question need not be answered here. No entry needed for Domestic Servants in private employment. If employed by a public body (Government, Municipal, etc.) state what body. (See Instruction 9 and Examples on back of Schedule.)	Whether Employer, Worker, or Working on Own Account. Write opposite the name of each person engaged in any Trade or Industry. (1) "Employer" (that is employing persons other than domestic servants), or (2) "Worker" (that is working for an employer), or (3) "Own Account" (that is neither employing others nor working for a trade employer).	Whether Working at Home. Write the words "At Home" opposite the name of each person carrying on Trade or Industry at home.	BIRTHPLACE of every Person. (1) If born in the United Kingdom, write the name of the County, and Town, or Parish. (2) If born in any other part of the British Empire, write the name of the Dependency, Colony, etc., and of the Province or State. (3) If born in a Foreign Country, write the name of the Country. (4) If born at sea, write "At Sea." NOTE.—In the case of persons born elsewhere than in England or Wales, state whether "Resident" or "Visitor" in this Country.	NATIONALITY of every Person born in a Foreign Country. State whether:— (1) "British subject by parentage," (2) "Naturalised British subject," giving year of naturalisation. Or (3) If of foreign nationality, state whether "French," "German," "Russian," etc.	INFIRMITY. If any person included in this Schedule is:— (1) "Totally Deaf" or "Deaf and Dumb," (2) "Totally Blind," (3) "Lunatic," (4) "Imbecile" or "Feeble-minded," state the infirmity opposite that person's name, and the age at which he or she became afflicted	LANGUAGE SPOKEN. (1) If able to speak English only, write "English." (2) If able to speak Welsh only, write "Welsh." (3) If able to speak English and Welsh, write "Both." No entry to be made in this column for children under three years of age.
1	Griffith Thomas Evans	Head	41		Married	~~6~~	1	1	0	Farmer & Miller 100		Employer 2		Carnarvon Garn S.C.			Both 2
2	Winifred Evans	Wife		38	Married	6	1	1	—					Carnarvon, Edeyrn			Both 2
3	Hywel Elfion Evans	Son	1											Lancashire, Spool	058		
4	Griffith Hughes	Servant	21		Single					Farm Labourer 130		Worker		Carnarvon, Hevin			Welsh 1
5	Elizabeth Thomas	Servant		15	Single					Domestic Servant 010	100	Worker		Carnarvon, Prentep			Welsh 1

Figure 18. 1911 UK Census Extract for Felin Rhyd Hir, Llannor Parish

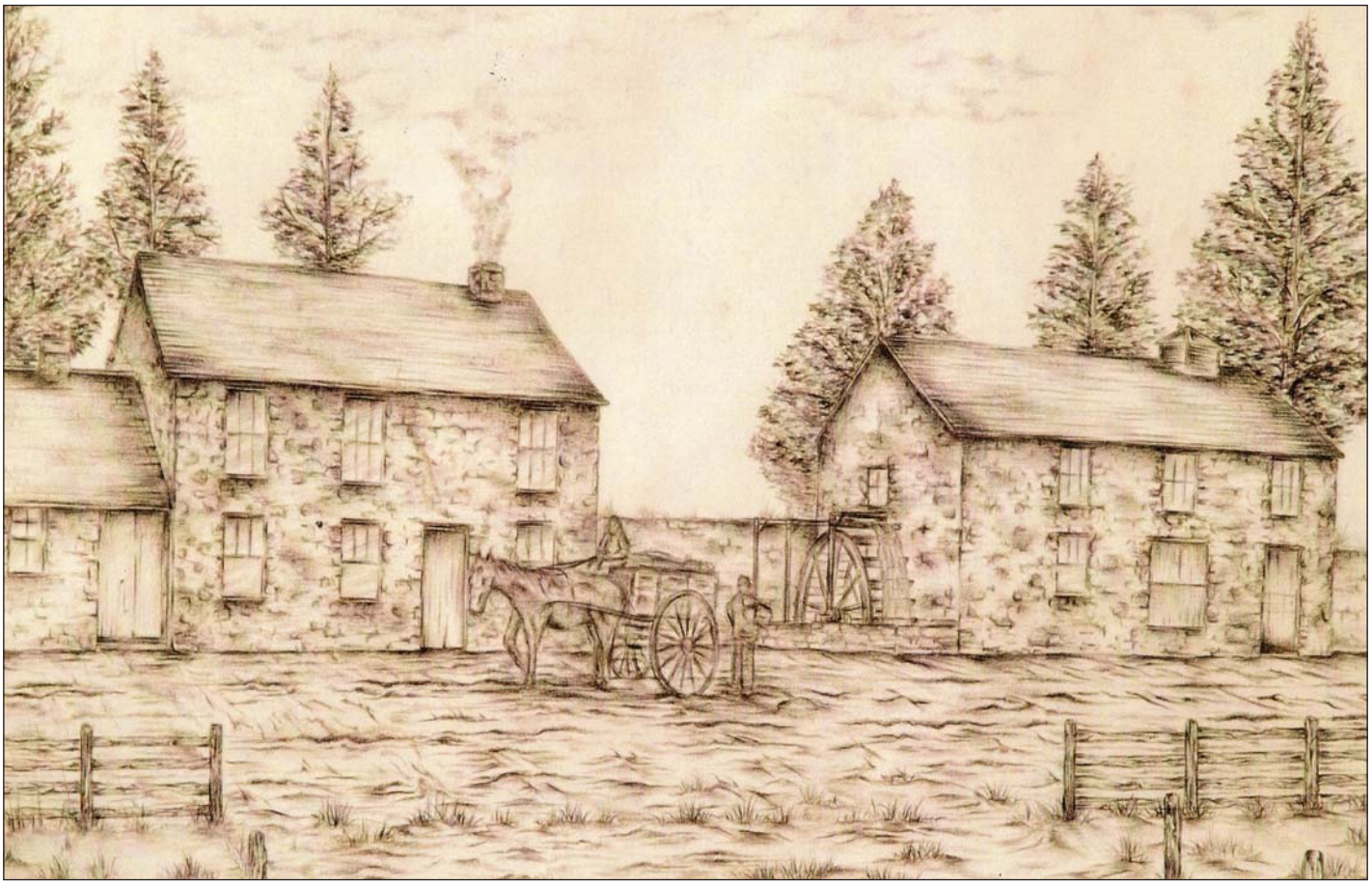
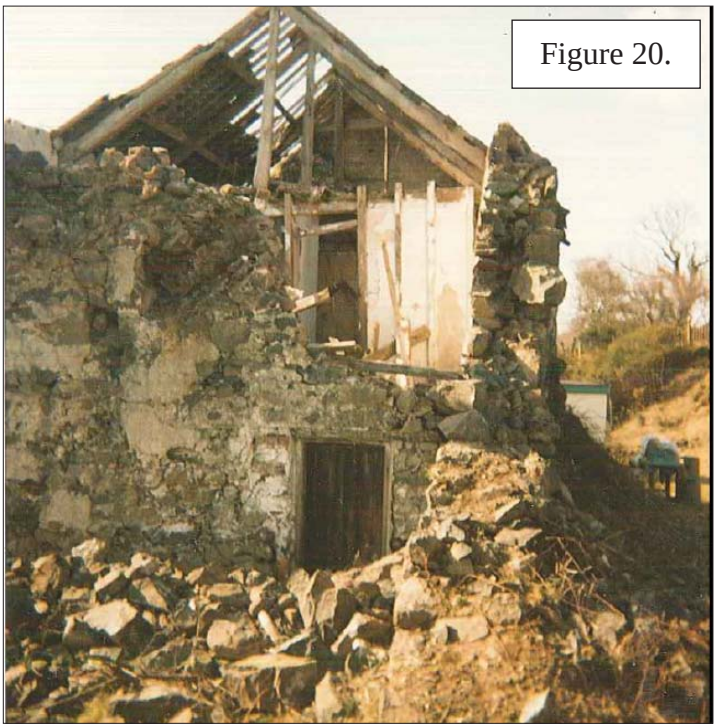
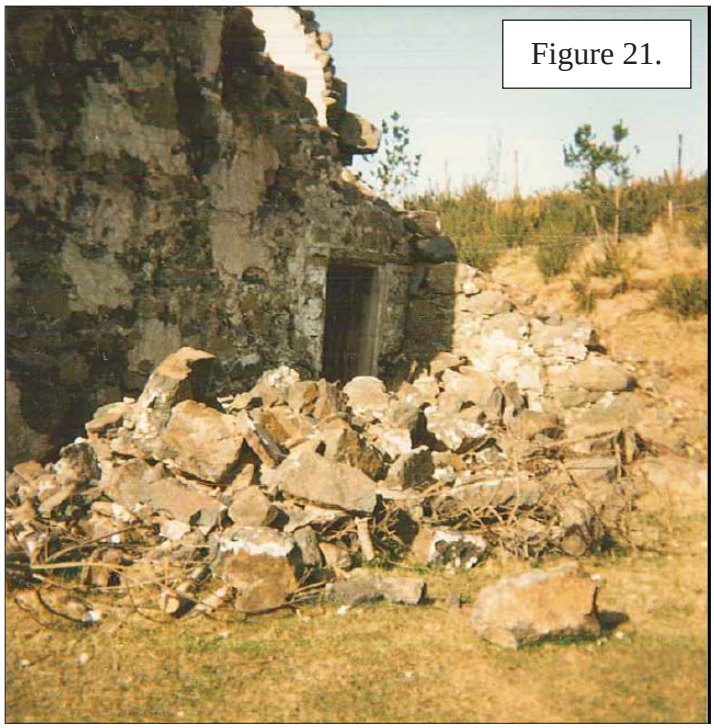
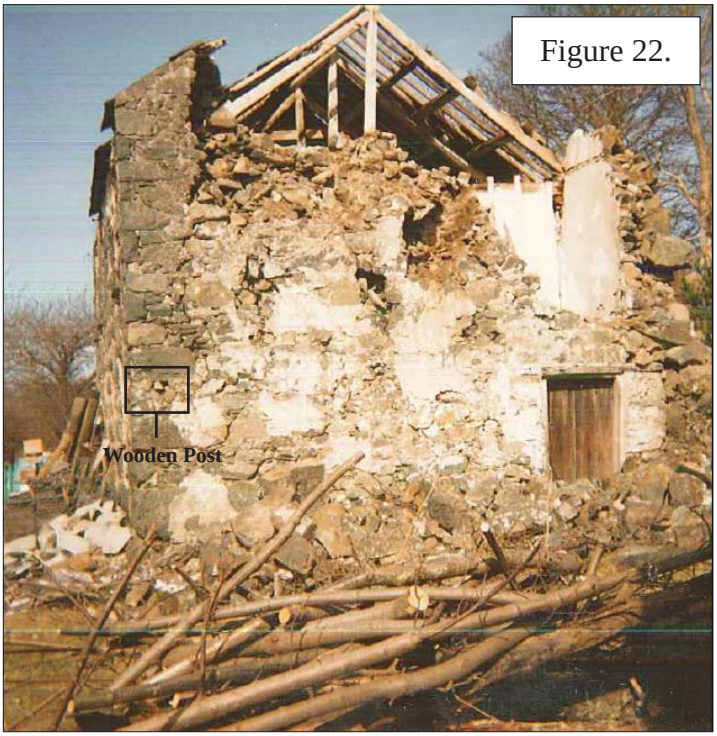


Figure 19. Undated Pencil Sketch of Old Mill House and Mill Whist Still in Use. There are no Structures Shown Between the two Buildings Indicative of an Early Twentieth Century Date. The Picture is Thought to Post-Date this but an Exact Date is Unclear. Of Particular Interest in this Picture is the Retaining Wall.







Figures 20 - 22. Series of Photographs Taken Around The Late 1980's Showing the Now Missing South-Eastern Gable Wall.

Of Particular Note are the Retaining Wall Which Only Survived to a Single Course in the Excavated Area, the Doorway and the Existence of a Third Floor Loft Space Which Local Residents Believe To Have Been Used as a Sleeping Area For Workers Operating on a Shift Pattern (Adrian Priest pers com).

Careful Examination of Figure 22 Shows the Remains of a Wooden Post Protruding From the Gable Wall at the Height of the Door Frame. This May be the Remains of a Temporary Structure Built Against the House (Photographs Supplied by Mr. A Priest)



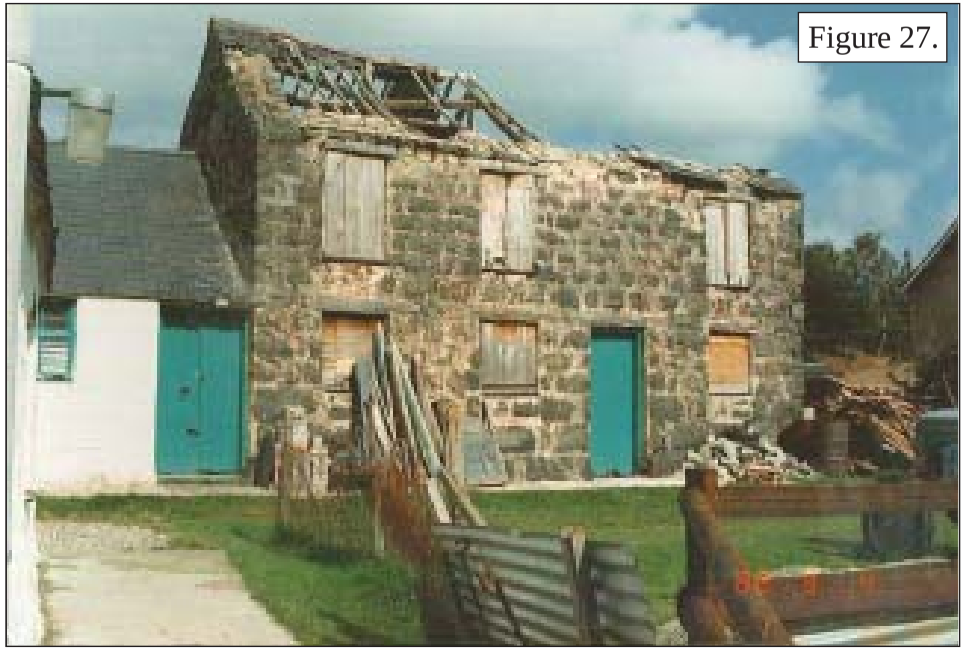
Figure 23. Photograph Taken c.1970 Showing the Miller's House. The Chimney is Suriving at This Point. It is of Interest That in the Photgraphic Survey Bricked-up Fireplaces Can be Seen at the Opposite End of the House.





Figures 24 & 25. Photographs Taken of the Miller's House & Mill in the Late 1980's Following the 1984 Earthquake





Figures 26 & 27. Photographs Taken of the Miller's House & Mill in the Late 1980's Following the 1984 Earthquake. Note The Large Crack in the Masonary

6.0 Excavation Results

Unless otherwise stated all photographs from this section onwards were taken by Adam Stanford of Aerial-Cam.

Excavation of a 5m x 7m trench against the gable end of the miller's house uncovered two archaeological features, one thought to belong to the late nineteenth or early twentieth century phase of the site and one which is likely to be earlier – possibly late eighteenth century. Figure 28 details the trench location and position of archaeological features within the trench. Figures 29-32 are post excavation photographs of the trench showing the features detailed below.

The eastern corner of the trench could not be excavated due to the presence of a concrete raft (08). A modern trench approximately 0.5m wide x 0.15m deep (feature number [06] fill number (07) has been dug against the gable wall of the miller's house and has truncated underlying features.

The remainder of the trench area was covered with a deposit of dumped/collapsed material (01) up to 0.25m in depth. It contained loose bricks and stone within a sandy clay matrix. The material was very mixed and in addition to material that was clearly modern, including soft drinks cans and crisp packets, contained a surprisingly large assembledge of ceramic, glass and iron artefacts dating from the 1850's – 1950's. This material is discussed in section 7.1.

Below layer (01) was another layer of rubble (09) which was present in the west of the trench. This rubble was very similar to (01) but it was separated from the main deposit by layer (03) – a dark layer of very compact mixed rubble possibly put down and compacted as hard standing. Layer (09) did not contain any artefactual material.

Below (01) directly opposite the doorway was a poorly laid predominantly brick surface (02) measuring approximately 2.70m x 2.20m and a single brick thick. The bricks were poorly fired and appear to have been reused from elsewhere as most were broken prior to being laid. The surface was also composed of a single stone slab which has been broken – presumably insitu. The surviving area of the surface is not thought to be the original extent as the feature is truncated to the south-west. The surface does appear to survive to its full north-eastern extent as the bricks appear to be laid to a height of three courses for a width equivalent to the length of one full brick (c.0.20m). It must be noted, however, that this added height occurs only against wall (05) and does not run the length of the surface.

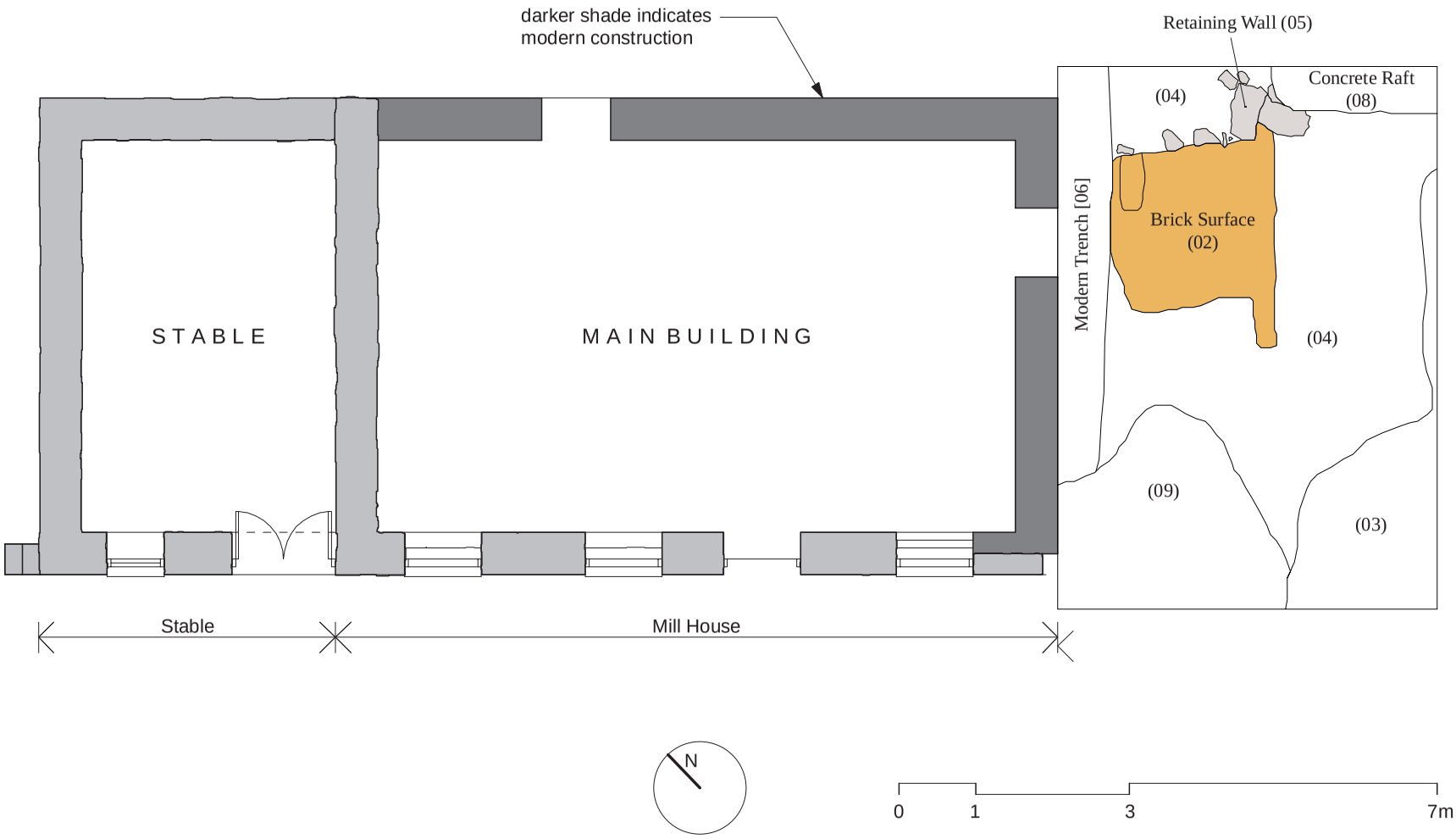


Figure 28. Plan of Site ShowingTrench Location and Plan of Archaeological Features
(Drawings Modified From Originals Produced by Alwyn Jones Architects)





Figure 29. (Left) Post-excavation Photograph of Trench Demonstrating Alignment of Doorway, Brick Surface (02) and the Waterwheel

Figure 30. (Above) Post-excavation Aerial Photograph of Trench



Figure 31. Brick Surface (02) and Retaining Wall (05). Photograph Taken by C. Rees



Figure 32. Brick Surface (02) and Retaining Wall (05). Photograph Taken by C. Rees

The brick surface butts against a row of rough stones (05) laid approximately south-east north-west. This row is almost certainly the remains of the retaining wall which once held back the bank behind the mill and miller's house. The wall was contemporary with the two buildings and was built directly on the ground surface without any footings. The wall once ran between the buildings and the line is preserved in the stump of wall behind the waterwheel. Most of this retaining wall was removed c.1960 when the rear bank was dug out, although photographs taken in the 1980's clearly show that a portion was retained near the south-eastern gable wall of the miller's house. The reason for this is uncertain but it may have been used to create an enclosed area around the side door.

All features lie on-top of a deposit of orange sand-gravel which is probably natural.

A full lists of archaeological contexts is included as Appendix A.

6.1 Discussion

The excavation carried out at Felin Rhyd Hir produced results which inform our interpretation of the miller's house and the area lying immediately to the south-east. No evidence was found to support the suggestion that the previous mill once stood where the miller's house is now situated. If an earlier mill were to have been sited in this area it is probable that a cut for the wheelpit would have been identified. Considerable effort would have been required to relocate the wheelpit and water supply and it is unlikely that this would have been expended to move such a small distance. In his synopsis of mill buildings Watts notes that “many mill buildings occupy old sites, often rebuilt on or close to the footprint of an earlier structure, in order to make use of established water supply systems” (Watts 2006: 29).

It was postulated by the Welsh Mills Society that an earlier mill was built where the miller's house now stands which utilised the same wheelpit and pond. No evidence was found which supported this hypothesis either, although structural evidence could have been completely removed by the erection of the current building. On balance it would seem more likely that the previous watermill at Felin Rhyd Hir was not located beneath the miller's house but rather it was situated in the location occupied by the current mill building.

Excavation results did support the hypothesis that there were additional buildings between the miller's house and the mill. It is thought that brick surface (02) may have formed part of a a larger base for a wooden or zinc structure which was roofed. Buildings are shown between the mill and

miller's house on the First and Second edition OS Maps and the feature may be the remains of the churning shed mentioned in the 1907 auction particulars for the mill site. The poor quality of this surface is in direct contrast to the carefully laid cobble floor in the stable at the opposite end of the miller's house and was clearly not laid with as much effort or care. This is indicative of a period of decline in the building's history, inferring a later date. When one examines the positioning of the feature it is clearly in line with the waterwheel and power could have been taken from this source as is once more mentioned in the auction particulars.

Within the excavated area very little damage appears to have been caused by modern services although the collapse of the miller's house in the 1980's has caused considerable disturbance.

6.2 Initial Finds Assessment

All the artefacts where recovered from a demolition/rubble dumped layer (01). The assemblage was comprised of 131 ceramics sherds, 20 glass pieces, 9 fragments of brick and tile, a single coin and the part remains of a butchered sheep.

The following section was written by Matthew Jones.

6.2.1 Buckley Pottery

Buckley pottery is a highly fired black/brown glazed red fabric earthenware made around the area of Buckley, Flintshire, from the 1600's to the early 20th century (Bebb 2004: 7). The potteries were famous for the production of large kitchen and dairy storage vessels and coursewares. The artefacts were made by a range of different pottery companies over the aforementioned period.

Thirty sherds of Buckley ware were recovered from the site, nineteen of which are body sherds and can not be attributed to any single vessel form. There are four large rim sherds and one body sherd from from a single large mouth storage bowl with a thick flat flange rim.

During the 1800's Buckley's pottery industry was dominated by two companies Hancocks and the Catheralls, (Williams 1986: 81). Hancock's were well known for their production of large storage vessels for the industrial and domestic market, so it is possible that this large mouth vessel comes from their kilns. The company operated from 1790-1886 (Davey & Longworth 2001: 64) and it is likely that this vessel dates from this period.

6.2.2 Stone Ware

Nineteen sherds of stone ware have been identified. These are a mix of body and rim sherds which are either white, cream or dark cream in colour. Seventeen of the shreds are from three separate jars. All the jars are straight sided with vertical indented lines set out in blocks of either ten or eleven, separated by a thicker indented line.

A single body sherd was printed in black with the date 1862 and the lettering of 'FOR MAR' (marmalade?). Above this lettering there is the image of a vine or branch with leaves and an acorn. It is likely that all of these jars were for preserves and were fairly common in most households and often reused. The dates of their use ranges from the late 1800's until the early 20th century.

6.2.3 Blue and White Printed and Transfer Ware

Forty-three sherds of blue and white ware where identified all of which appear to have been transfer printed rather than painted. Overall the assemblage contained twelve separate plates, four tea cups and two possible jars. There was also a large selection of smaller pieces that could not be ascribed to any vessel type although its likely that they are parts of similar items to those noted above.

Decoration types are the 'Asiatic pheasant' and 'Willow pattern on the plates with one of the jars displaying a the 'Oriental Birds' print (Bebb 2004). There are two separate parcel makers marks which are as yet unidentified.

6.2.4 White and Cream Ware

The Felin Rhyd Hir assemblage contained thirty-three pieces of white and cream ware made with white fine grained clay. The vessel types are similar to those found amongst the blue and white transfer ware with two tea cups and six individual plates identified. Also present was a large folded hollow rim which could have possibly have come from a large decorative bowl.

6.2.5 Teapot

The remains of the top half of a tea pot with lid where identified. The body is a fine-grained cream colour with a brown glaze. The rim is decorated with raised circular indentations within a border. The shoulder has roughly-made eight-petalled flowers as a repeated motif along the outside. The flower is glazed in an off-cream (grey glaze). Suggested date for this vessel is late 19th to 20th century.

6.2.6 Striped Colour Glazed Kitchen Ware

Nine pieces of a fine-grained white body ceramic representing five individual vessels were identified. All sherds are painted with three equally-spaced lines descending from the rim which leads to a larger area of colouring and then possibly covered in a clear glaze. All the sherds from the assemblage are a shade of blue. These pieces have been interpreted as bowls and could have formed part of a kitchen set (sugar bowls and cups). They are early to mid 20th century in date.

6.2.7 Brick and Tile

Two heavily worn pieces of kiln brick were identified. These are similar to complete bricks recorded on the site and are likely to come from the on-site kiln.

Seven pieces of course-grained red clay tile where recovered. Most show very fine straight moulded lines but no images can be made out, tentatively one piece is stamped 'MADE IN' but is broken at the point after this. These are possibly floor tiles.

6.2.8 Glass

Twenty sherds of glass were recovered, all of which were either clear or light blue in colour. Most pieces where undiagnostic body sherds with no markings.

Three sherds have measuring markings running up the side of the bottles with lettering that indicates that you should either be using tea or table spoons. Two of the bases of these measured bottles have the letters xxxx on the base and it is therefore likely that these bottles contained a toxic substance and were used for veterinary or human medicine.

Two body sherds had the lettering 'WLLI' and 'ELI' which shows that at least two of these bottles either come from or were made for a Pwllheli-based company. The quality and clearness of the glass would suggest that they are either late 19th or early to mid 20th century in date.

6.2.9 Coin

A George IV copper alloy half penny coin dated 1936 with some damage on the face side and some rust and oxidisation, otherwise in good condition.

6.2.10 Iron Artefacts

A number of undiagnostic iron artefacts were uncovered during the excavation. Most were in the form of corroded bars, nails and possible machinery parts. A single horseshoe was identified.

6.2.11 Discussion

The pottery assemblage collected during the excavation conducted at Felin Rhyd Hir covers a range of almost a hundred years, with pieces dating from the mid 19th to early 20th century. This range may represent the accumulation of household refuse over a long period of time, or the curation of ceramics over several generations. The deposit from which this material was gathered was not a sealed or secure context and this material is likely to have been dumped from elsewhere rather than have accumulated insitu. The assembledge is however almost certainly from the mill house and associated area.

High status ceramics (fine wares) dominate this assemblage and whilst rougher storage vessels are represented by the stone and Buckley wares they represent a smaller percentage of the total vessel count. The fine wares are all associated with dining or tea drinking and the repetition of the same design on different vessel types is thought to be representative of a set.

This is indicative of a relatively affluent household as the users of these vessels had access to the money and resources to acquire fine wares and were engaged in social circles where the use and display of fine wares would be acknowledged. The census information from this period would support these findings as the resident families were able to afford to employ a number of servants and their standard of living was certainly far above subsistence level.

7.0 Felin Rhyd Hir Photographic Survey

The following section has been subdivided for ease of discussion and interpretation.

7.1 General Shots

The first section contains general shots (Figures 33 – 40) detailing the surrounding landscape features. The proximity of the site to the Pont Rhyd Hir Bridge (Figure 39) must be noted as must the road running alongside the mill (Figure 33). These features are both mentioned in the historical background section and are crucial in our understanding of why so much money was invested in the mill, kiln and miller's house during the later eighteenth century.

To the rear of the mill and house the now dried mill pond can be seen (Figures 33 – 35 & 37 – 38), as can the very end of the mill race (Figure 37). The Felin Rhyd Hir mill receives its water supply from the tailrace of Melin Llannor with the water travelling a distance of 1.7km – a huge investment in both initial excavation and upkeep (www.coflein.gov.uk). It would seem likely that, as the mill would have always required a water supply, the mill race and pond are early in origin - possibly maintaining and enhancing work initiated during the medieval period. Llannor mill is also known to have medieval origins which could support this theory.

This general set of photographs allows the outbuildings to be viewed in relation to the main buildings and allows one to better understand the site as a whole.

7.2 The Felin Rhyd Hir Mill & Kiln

Through careful examination of cartographic and other historical sources it has been concluded that the Felin Rhyd Hir mill and kiln were likely to have built during the late eighteenth century and are roughly contemporary with the Pont Rhyd Hir bridge (see section 5.3). The mill building is likely to have been built on the site of earlier mill structures, possibly dating as far back as the medieval period. The mill and kiln are purpose built as a single industrial unit rather than the kiln being added later.

The Felin Rhyd Hir mill/kiln and the miller's house are a pair of contemporary structures, and strong stylistic similarities are evident (refer back to Figures 19 & 24). The buildings are positioned along the same north-west – south-east alignment (Figure 41) and are stone built in the local vernacular style, albeit on an industrial scale.



Figure 33. Aerial View of Felin Rhyd Hir Mill Showing the B4415 (an old Drovers Road) and the Mill Pond to the Rear



Figure 34. Aerial View of Felin Rhyd Hir Mill and the Miller's House. The Mill Pond Area can be seen to the Rear



Figure 35. Aerial View Showing the Miller's House and Attached Stable. The Cookhouse is visible in the Foreground and the Mill Pond can be Seen to the Rear



Figure 36. Aerial View Showing the Miller's House and Attached Stable. The Cookhouse and Barn are visible in the Foreground.



Figure 37. Aerial View of Site With the Barn and Cookhouse in The Foreground. The Stable and Miller's House are Visible Behind and the Mill Pond can be Seen to the Rear



Figure 38. Aerial View of Site With the Barn and Cookhouse in The Foreground. The Stable and Miller's House and Mill are Visible Behind and the Mill Pond can be Seen to the Rear



Figure 39. Aerial View of the Afon Rhyd Hir into Which the Mill Drains. The River is Spanned by the Pont Rhyd Hir (Built 1780)



Figure 40. Drainage Channels Running into the Afon Rhyd Hir



Figure 41. Aerial View of Felin Rhyd Hir Stable, Miller's House and Mill/Kiln Demonstrating The Clear Linear North-West - South-East Alignment of the Building Range



Figure 42. Front Elevation of Mill and Kiln Prior to Conversion to a Dwelling. Taken c.1950

Both structures were slate roofed and built as two storey structures with additional attic spaces. The eaves overhang the walls in a manner that is distinctive of large structures in Llŷn and Eifionydd from the late 18th to the early 19th century (Gwyn 2010: 4). The slatted wooden cupola vent on the kiln roof has been restored.

The mill building exterior was modified during the 1970's and 80's as is evidenced by a photograph of the mill taken c.1950 (photograph supplied by Mr Priest). The original wooden windows have been replaced with plastic frames and skylights have been inserted into the roof. A modern stone porch has been added covering the original front entrance to the mill and the front door to the kiln area has been replaced with a window. To the rear of the building the doorway through which the first floor of the mill was reached has been replaced with a UPVC window. Ribbon pointing with cement was also carried out during this period of works.

Figures 43 – 50 detail the mill and kiln exterior.

7.2.1 Felin Rhyd Hir Water Supply Including Millwheel and Wheelpit

The Felin Rhyd Hir millwheel has recently been restored by Mr Priest and it is hoped that the buckets will be added soon to complete the works. The wheel was originally supplied with water collected in the mill pond to the rear of the building. The mill pond is now dry and the millrace is overgrown. The launder has been destroyed which presumably occurred when the rear bank was removed. From the pond, water was channelled over the wheel into the forty Elm buckets. The flow rate was controlled from within the mill via a lever. There are no makers' names or dates visible on the waterwheel and it is felt that it could have been manufactured locally (Welsh Mills Society).

The following technical description of the wheel and water system was produced by the Welsh Mills Society. It was written using notes and observations made during a visit in 1985 and is quoted verbatim:

"The wheel is of the hybrid variety using both metal and timber components. It consists of cast iron segments bolted together to form the rim or shroud and joined to the centre bosses, also of cast iron, by wooden spokes. The axle is of timber with cast iron gudgeon of the four-winged variety mortised into the timber and retained by wrought iron hoops. The hubs or bosses are centred and retained upon the axle by means of timber wedges driven between the two.



Figure 43. Gable & Rear Elevation of Mill House and Kiln. The Chimney is a Modern Addition. The Rear Elevation Would Not Have Originally Been Visible Below First Floor Level



Figure 44. Aerial View of Front Elevation of Mill & Kiln Showing Modern Porch



Figure 45. Waterwheel and Front Elevation of Mill House and Kiln. Note Hard Cement Render Which is Rather Out of Character with the Building as a Whole



Figure 46. Slate Roof With Slatted Wooden Cupola Roof Vent (Largely Reconstructed) Serving as Evidence of Use as Corn Drying Kiln



Figure 47. Rear of Mill/Kiln Structure. Note Splaying of Rear Elevation at Base of Wall



Figure 48. Waterwheel Restored By Current Owner



Figure 49. Waterwheel and Wheelpit. Possibly Pre-dating the Mill Structure



Figure 50. Waterwheel, Outlets and Pond to the Front of Mill

The wheel is of the overshot type with forty, timber buckets. Fed by a launder from the mill down, now drained but still clearly defined and fed, originally, by a leat at its northern end. The leat has its origin higher up the Afon Rhyd-Hir at another mill, now demolished, near Llannor village. The leat was therefore some 1800 yards in length and followed, where feasible, a few feet below the 50-foot contour. The higher mill was referred to as "Melin Llanor". The leat is still traceable for most of its length but a land improvement scheme has destroyed the site for some 300 yards before Efail-y-Bont, as have farm buildings at the Llannor end.

A pair of stones from the Llannor mill stand in the farm yard there and are of the same type and composition as those insitu at Felin Rhyd-Hir.

Water Supply: Felin Rhyd-Hir

a) Originates at weir, S.W. of Llannor village at height of approximately 56 (ft) above sea level.

b) Originally serving other mill at this point.

c) Water diverted into prepared leat which follows left bank of river (Afon Rhyd-Hir) at higher level.

d) Crosses beneath road, A497, at Pont Bodvil. Field on opposite side of road recently drained and 'improved' removing all trace of watercourse.

e) Leat may have been lined with puddle clay as nature of sub-strata of glacial or lacustrine origin would allow water to percolate through.

f) Possible that some part of route, where ground unfavourable was conveyed by wooden laundes (Llammar Farmer).

g) Possible that some form of over flow device would allow surplus water to return to river in time of flood before reaching mill pond.

h) Mill pond approximately 30 feet above level of river at mill site.

i) Water fed to wheel, housed in 'lean-to shelter' or outhouse, via wooden launder. Details unverified but possibly similar to arrangement at Bryncir, ie a trap door in the floor of the launder and ahead of the wheel to divert water into wheel pit. Control from mill interior by lever system.

j) Some form of sluice must have controlled flow from dam when wheel closed down. No evidence of overflow perhaps relying on diversion up stream.

Metal Components: Felin Rhyd-Hir

1) ***Rim or Shroud Plates.***

   a) *Cast in iron; eight sections per side bolted together at an end flange. Ribbed at top and bottom edges.*

   b) *One spoke per section with substantial housing cast into rim section. Off set from centre of section.*

   c) *Equivalent of five buckets per section split as four and two halves.*

   d) *Bucked board / sole plate fastenings cast into rim sections.*

2) ***Hub.***

   a) *Cast in iron as one piece per side.*

   b) *Based upon regular octagon with spoke housing at each corner.*

   c) *Hub appears to have weathered less than other parts of the wheel.*

   d) *One spoke housing cracked; now held together by forged u-section and strap.*

Wheel Fastenings: Felin Rhyd-Hir

1) ***Hub/Spoke***

   a) *Noted as 7/16" bourne out by thickness of nut but as this appears rather small requires recheck. Drawn as 5/8" diameter.*

   b) *Square section under head conjectural but seems logical in order to locate bolt whilst tightening.*

   c) *Square nuts seat onto cast plate. Check presence of recess or facing.*

2) ***Rim/Spoke***

   a) *Measured at 5/8" diameter.*

   b) *Square section under head conjectural.*

   c) *Spherical head.*

   d) *Square nuts seat onto metal plate which appears to have been sheared and galvanised therefore of more recent origin.*

3) ***Rim Sections***

   a) *Square head bolts of ¾" diameter.*

   b) *Hexagon nuts conform to BSW proportions.*

   c) *Fitted with plain washers.*

4) Bucket Board

a) Measured as 7/16" diameter – check.

b) Squared section under head.

c) Square nuts of BSW proportions – bevelled.

d) Fitted with plain washer.

5) Bracing rods

a) 3/8" square wrought iron.

b) Spherical riveted head through rim sections.

c) One per segment.

All sizes taken as best average from mostly corroded examples. As most sizes conform to BSW proportions it is possible that they are not the original fastenings unless wheel installed after 1860.

<u>Metal components: Felin Rhyd-Hir (2)</u>

1) Gudgeon.

a) Cast in iron and of the four winged variety attributed to Smeaton 1771.

b) Casting machined on centres, still evident (internal) end not visible, but possibly machined as cylinder.

c) Tightened into axle timber by metal wedges.

d) Twin bearing surfaces; larger to fit journal block, machined with radius on inner end; smaller diameter roughly machined only. Hole drilled (cored?) radially into outer end.

2) Gudgeon Hoops.

a) Twin hoops of wrought iron; fire welded and fitted onto axle end.

<u>Metal Components: Felin Rhyd-Hir (3)</u>

1) Outer Bearing.

a) Pedestal type of cast iron with detachable / adjustable cap.

b) Cap held in place by square headed bolts passing through from base.

c) 'Steps' or 'brasses' of cast iron, top 'brass' now missing but wear marks on cap indicate definite presence.

d) Gap adjustable for packing between cap and base.

e) 'Brasses' located by triangular slot and corresponding lug at either end.

f) Large lubricant reservoir cast integral with cap; central hole to convey lubricant to interior.

g) Rough finish of underside and ends would indicate that block was bolted directly onto timber baulk rather than cast plate.

h) Length of bolts above cap would indicate that no lock-nut was fitted.

i) Cored rectangular slots in base provide means of lateral adjustment.

Timber Work: Felin Rhyd-Hir

1) Buckets.

a) End boards slot into framing, retained by front boards.

b) Front boards, bevelled at outer edge, held onto framing by two carriage type bolts with square nut and plain washer.

c) Sole boards held to framing by similar bolt. Check widths and allowance for curvature.

d) All timber used for the buckets is English Elm, possibly of local origin. Timber thickness 1 1/16". Quality of workmanship indeterminate due to weathering. Could be original.

2) Spokes.

a) Not original and badly fitted. Note shoulder cut away to accommodate mis-match.

b) Material oak, rough sawn – but check.

3) Axle.

a) Octagonal in section and cut to fair degree of accuracy.

b) Material? Check.

c) Ends tapered to cylindrical form to accommodate gudgeon and associated reinforcing bands.

d) It is most certain that this is original but is now badly weathered.

4) Hub Wedges.

a) Cut to taper of 1 in?

b) Made from ?

c) Badly weathered but considered original" (Welsh Mills Society Unpublished Material).

Figures 51 – 54 illustrate the current status of the millwheel and wheelpit area. John Brandrick of A0 Technical Drawings has produced a number of 3-D illustrations of the water mill and corn drying kiln (Figures 55 – 56). All annotations on these drawings were added by John Crompton of the Welsh Mills Society.

7.2.2 Mill Interior

Although the mill interior has been altered to allow habitation, remarkably the mill machinery has been preserved and the conversion has simply boxed in around the existing features. This is an incredibly fortuitous situation as is evident if one refers back to Figure 3 and the low levels of mill machinery survival on the Llŷn Peninsula.

For ease of discussion the following description of the building interior will be divided into first and ground floor levels. The machinery will be discussed separately, although due to the layout of the mill the photographs will be incorporated into the Figures by floor.

7.2.2.1 Ground Floor

At ground floor level the mill has been reused as a living room (Figures 55 – 57). The flooring in this room dates from the time of the mill's operation although it is thought to have been a later addition. The rippled blue-purple slate slabs used are unique to Cloddfa'r Lôn quarry in Nantlle, and were widely used in the early 19th century (Gwyn 2010: 3). The fireplace and chimney breast are modern additions.

The majority of the machinery at ground floor level is hidden behind the boarding of the hurst screen (Figures 58 – 61). Iron shafts carrying wooden pulleys to drive the sack hoist, and dressing machines are visible in the living room. A collection trough and flour chutes are integrated into the hurst screen and form a feature wall (see Figures 55 – 57). A doorway leads from the living room into the kitchen which is located with the area previously occupied by the kiln.



Figure 51. Added Attachment Which May Have Allowed the Water Power from the Wheel to be Utilised to Drive an Additional Mechanical Device - Possibly to Churn Butter



Figure 52. 1667 Date Inscription on Stone Reused Above Wheel Shaft. Photograph Shows Position of Numbering



Figure 53. 1667 Date Inscription Reversed and Enhanced for Ease of Viewing

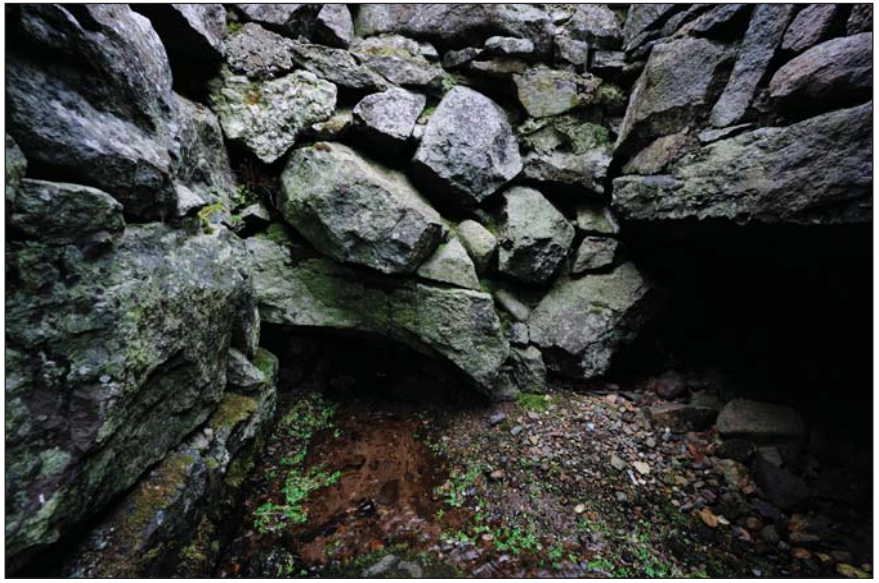


Figure 54. Stone Outlets at Base of Wheelpit. The Outlet to the Right is Believed to Function as an Overflow. This Mill Element May Pre-date the Current Mill Building

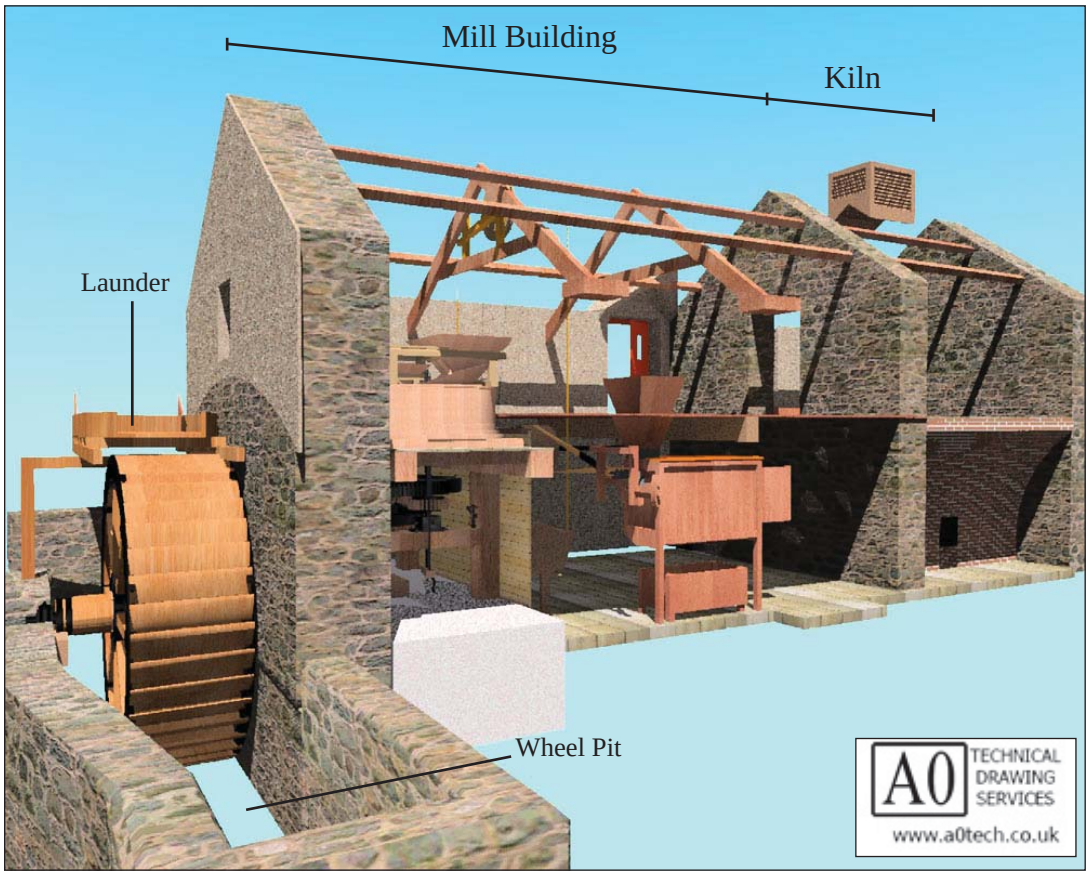


Figure 55. 3-D Cut-away Reconstruction of the Felin Rhyd Hir Mill
(Produced by & Copyright A0 Technical Drawing Services)

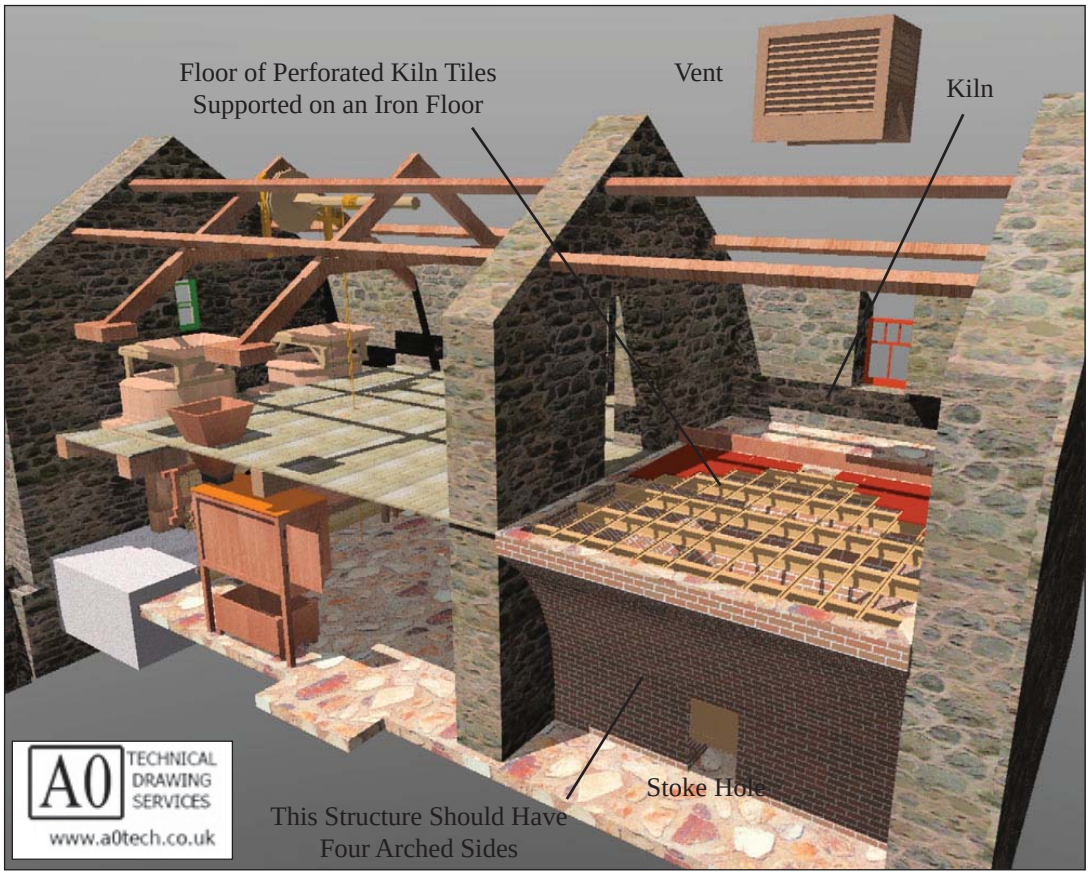


Figure 56. 3-D Cut-away Reconstruction of the Felin Rhyd Hir Mill Showing Internal Kiln Structure & Location of Internal Machinery
(Produced by & Copyright A0 Technical Drawing Services)



Figure 57. Ground Floor of Mill Showing Hurst Frame Boarding and the Iron Shaft/ Wooden Pulley System Belonging to the Sack Hoist



Figure 58. Ground Floor of Mill Showing Hurst Frame Boarding With Associated Trough and Flour Chutes



Figure 59. Ground Floor of Mill Showing Hurst Frame Boarding and the Iron Shaft/ Wooden Pulley System Belonging to the Sack Hoist

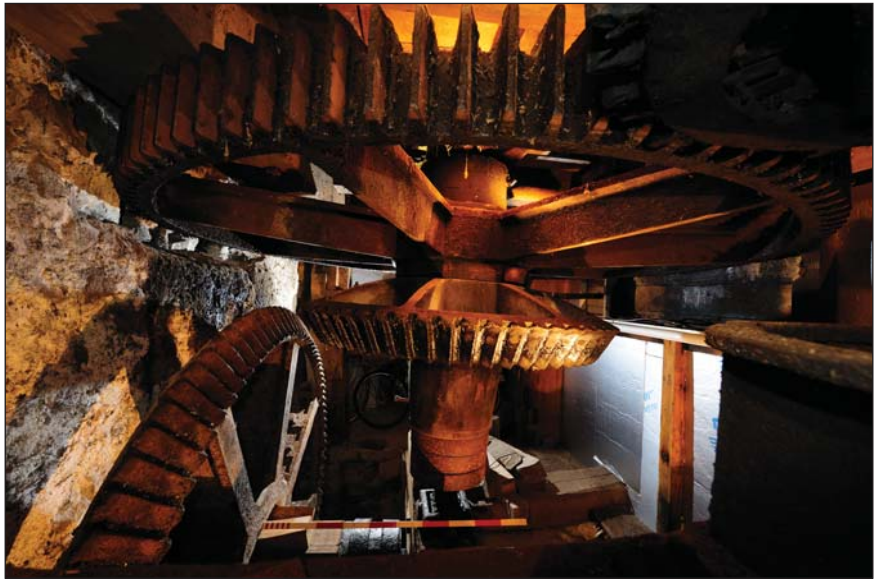


Figure 60. Surving Mill Machinery. Shown are the Pit Wheel Upright Shaft and Great Spur Wheel

7.2.2.2 First Floor Level and Loft

At first floor level a wooden frame has been inserted to allow the area to be subdivided into two bedrooms (Figures 69 – 71). The mill machinery has once more been preserved and two wooden hoppers are retained behind a wooden screen. The insertion of a loft level above the bedrooms has preserved the upper shaft and wooden pulley of the sack hoist (Figure 72).

7.2.2.3 Watermill Machinery

The preservation and workings of the mill machinery is of great significance and a number of technical drawings illustrating the operations of the watermill machinery have been produced by John Brandrick of A0 Technical Drawings and annotated by John Crompton of the Welsh Mills Society (Figures 65 – 68, 75 – 78). This is supplemented by a photographic record (Figures 60 – 64, 72 – 74).

The machinery preserved in the mill is thought to be of a later date than the mill building itself, and mill stones found around the mill complex have clearly been reused from the mill. Advances in technology throughout the period of the mills use would have facilitated change, and as with any machinery, parts wear and need to be replaced.

7.2.2.4 Kiln Interior

Kilns were once a common feature associated with milling in upland regions of Britain. High rainfall often caused a late, damp harvest and it was necessary to lower the moisture content of any grain to between twelve and eighteen percent (Watts 1983: 16). The ground floor of the kiln would have once contained the furnace (see Figure 56) and now serves as a kitchen. The original front door has been replaced with a window and an additional entrance has been added to the rear of the building.

At first floor level the drying floor of the kiln has been removed to allow habitation. The upstairs space has been divided into a bathroom and bedroom (Figures 79 – 82). The restored slatted wooden cupola vent is exposed in the bedroom ceiling. A large number of the tiles have been retained by the owner (Figure 83) and alternative sources can be consulted to reconstruct how the floor would have once appeared (Figure 84). It was previously possible to enter the rear of the building at first floor level via the top of the bank. This entrance now contains a window.

A plan showing the positions of interior photographs in the mill/kiln is included as Appendix B.



Figure 61. Pit Wheel Gear

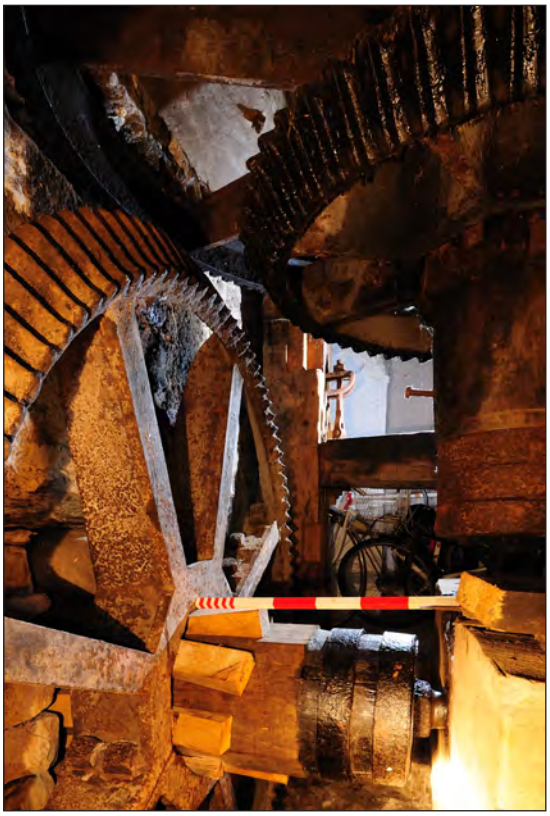


Figure 62. Pit Wheel Gear



Figure 63. Great Spur Wheel



Figure 64. Bedstone Visible at Top of Photograph

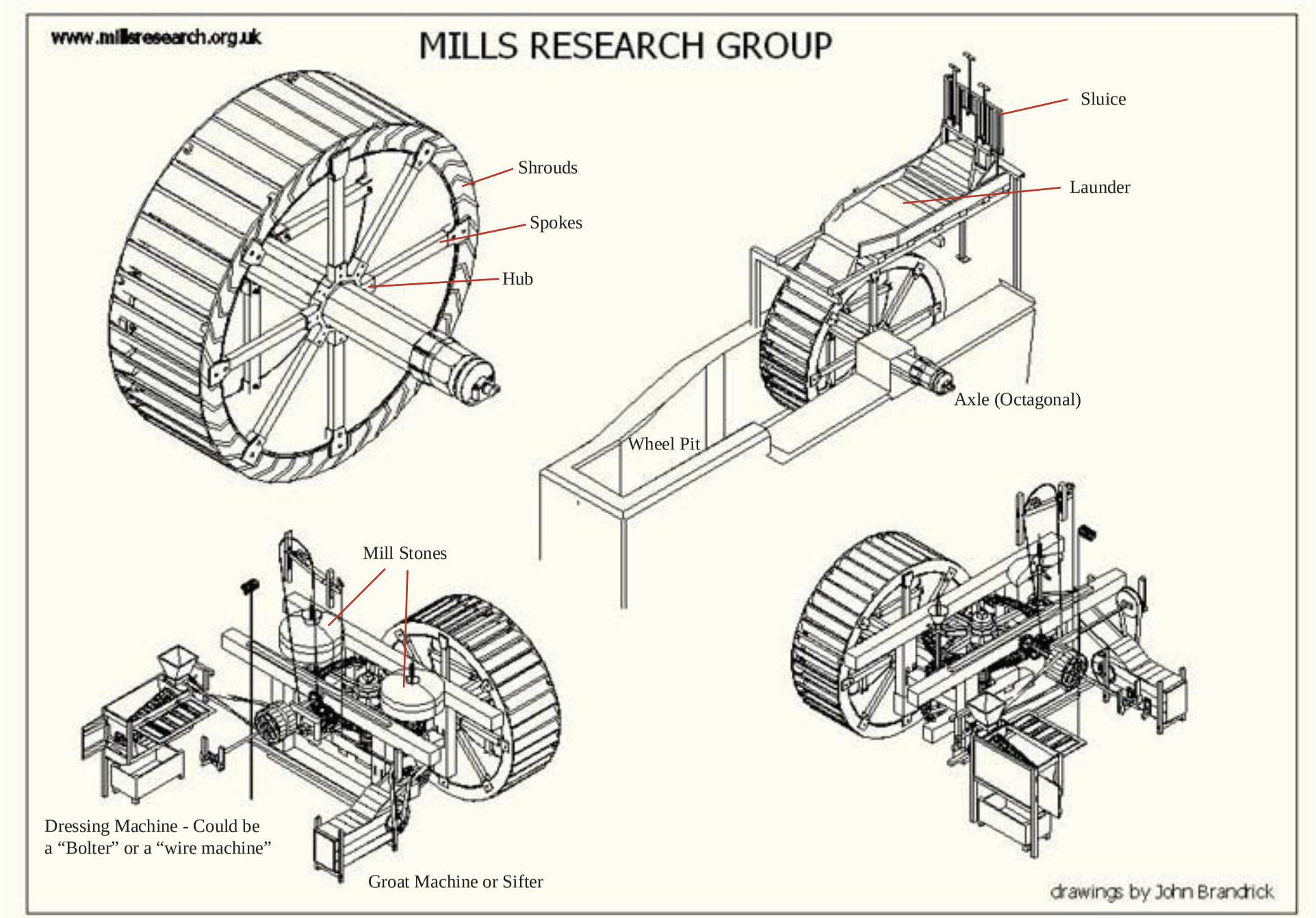


Figure 65. 3-D Line Drawings Sketching the Waterwheel and Associated Mechanisms Utilised at Felin Rhyd Hir
(Produced by & Copyright Welsh Mills Society)

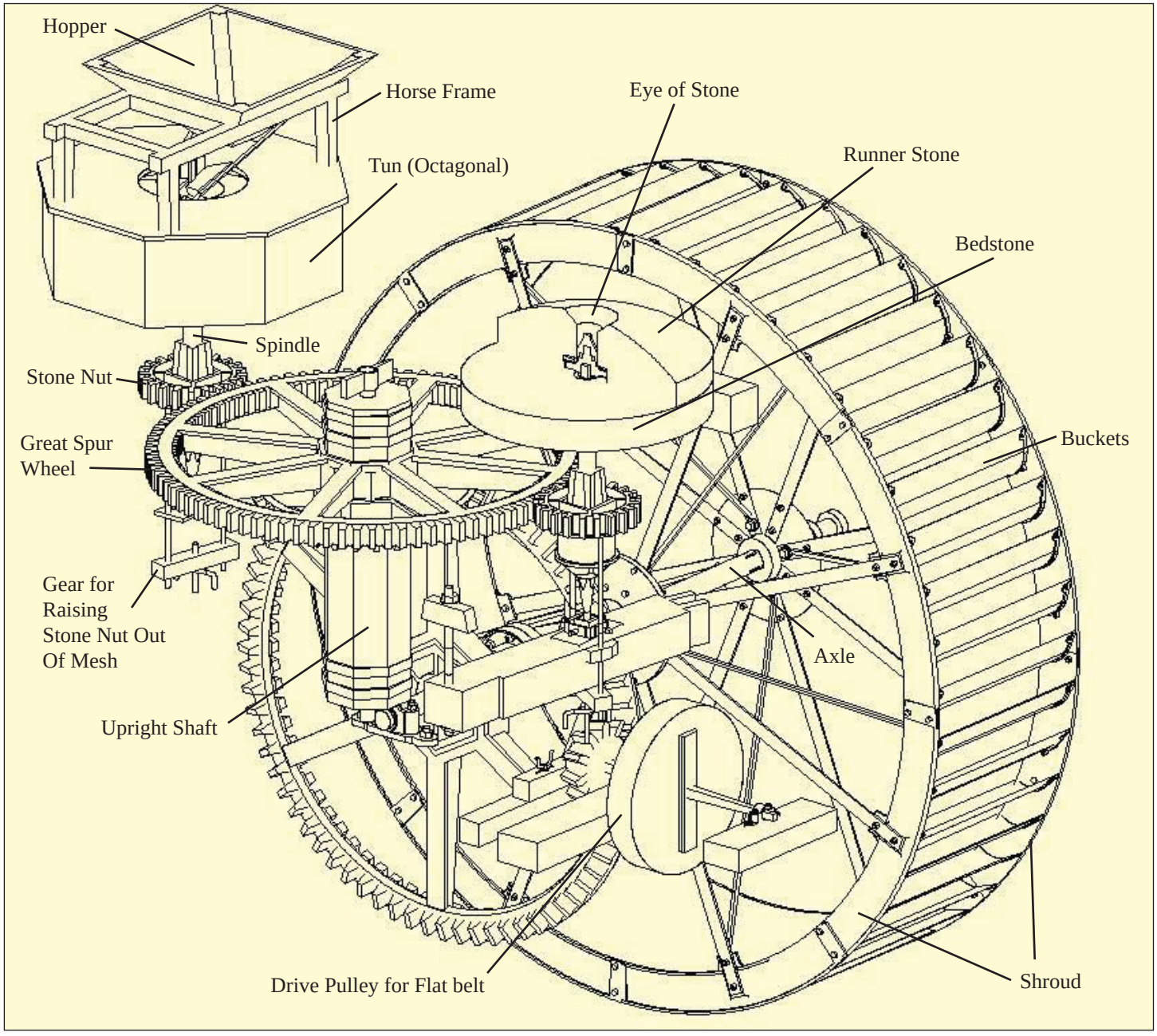


Figure 66. Annotated 3-D Line Drawing Illustrating Typical Mill Mechanism and Waterwheel Similar to That Found at Felin Rhyd Hir (Produced by & Copyright Welsh Mills Society)

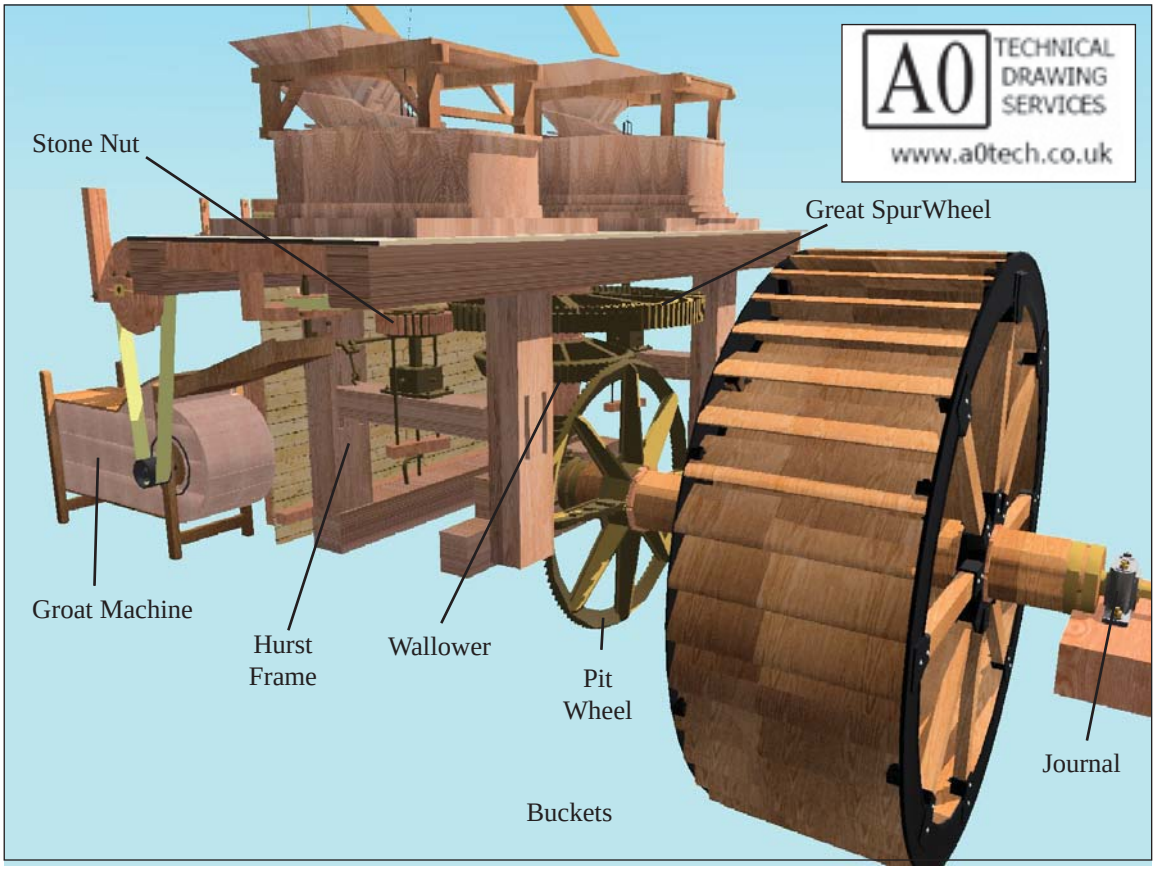


Figure 67. Annotated 3-D Reconstruction of the Felin Rhyd Hir Mill Mechanisms Concentrating on Elements Positioned at Ground Floor Level

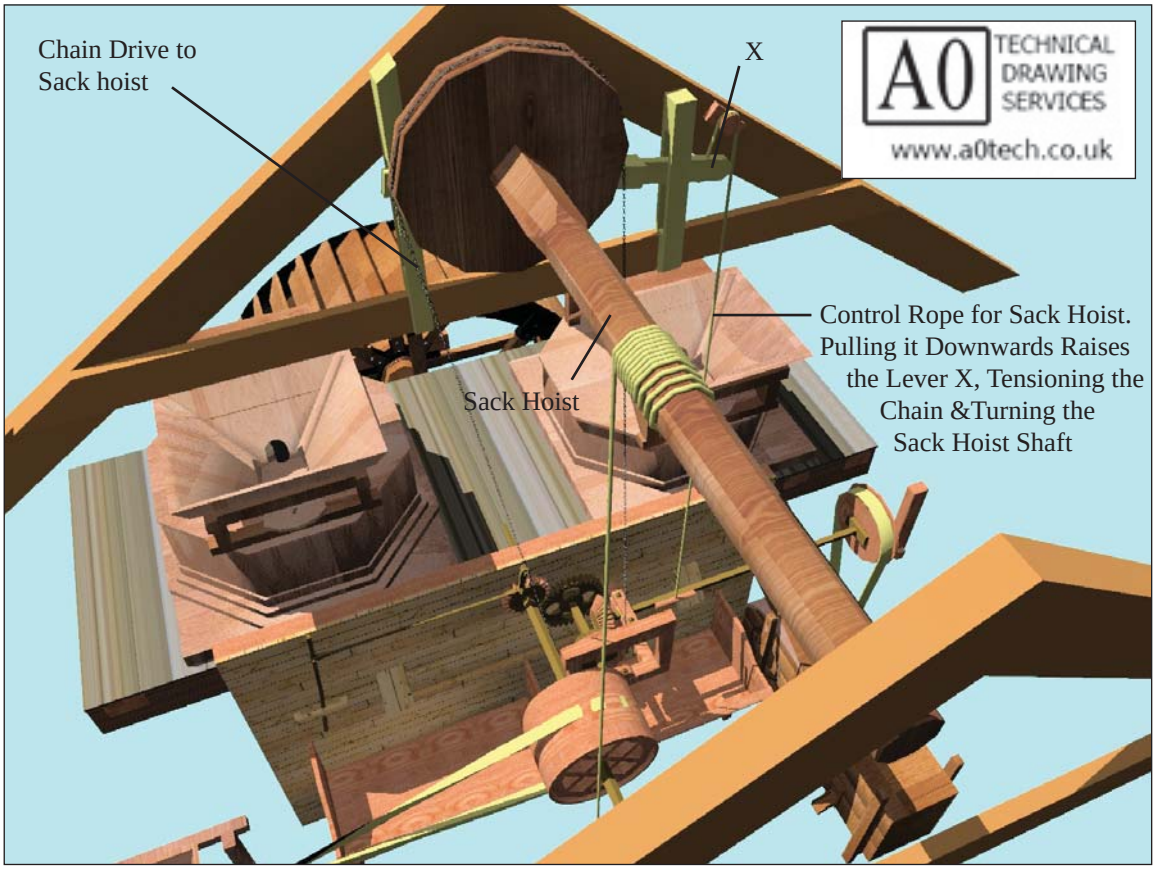


Figure 68. Annotated 3-D Reconstruction of the Felin Rhyd Hir Mill Mechanisms Concentrating on Elements Positioned at or Near Roof Level



Figure 69. Mill Upstairs Corridor Leading to Bedrooms and Grain Hoppers. Note Division does not Reach Ceiling Preserving The Sack Hoist and Wooden Pulley



Figure 70. Upstairs Bedroom in Mill



Figure 71. Second Upstairs Bedroom in Mill



Figure 72. Sack Hoist in Attic Space



Figure 73. Grain Hoppers, Horse Frames and Octagonal Tuns Preserved at First Floor Level



Figure 74. Grain Hoppers, Horse Frames and Octagonal Tuns Preserved at First Floor Level

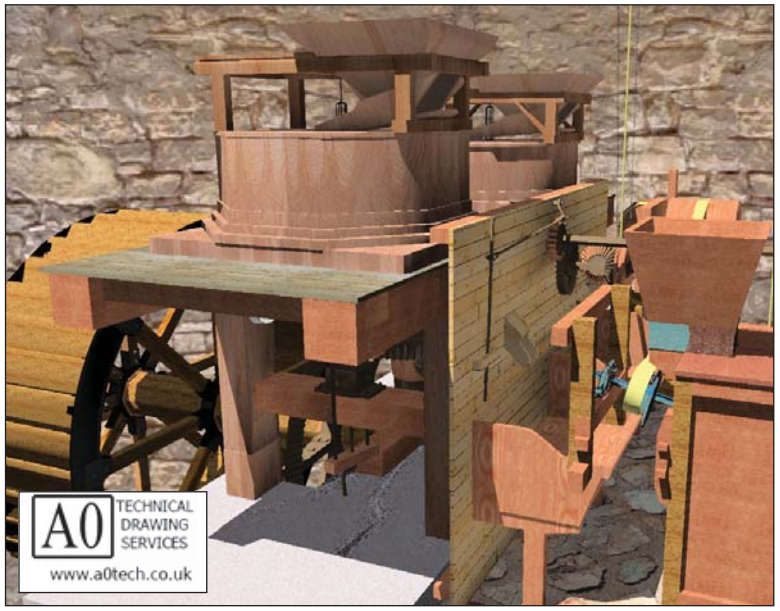


Figure 75. 3-D Diagram of First Floor Level Machinery (Produced by & Copyright A0 Technical Drawing services)



Figure 76. 3-D Diagram of First Floor Level Machinery (Produced by & Copyright A0 Technical Drawing services)

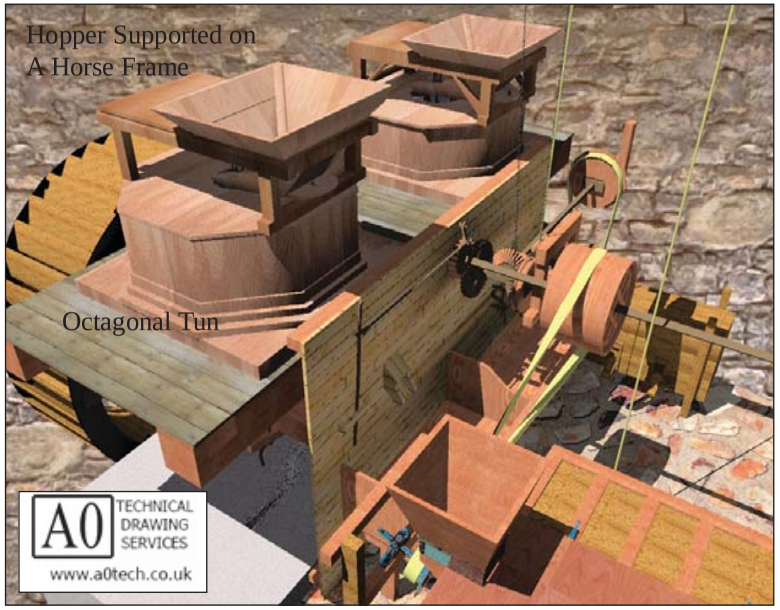


Figure 77. 3-D Diagram of First Floor Level Machinery (Produced by & Copyright A0 Technical Drawing services)

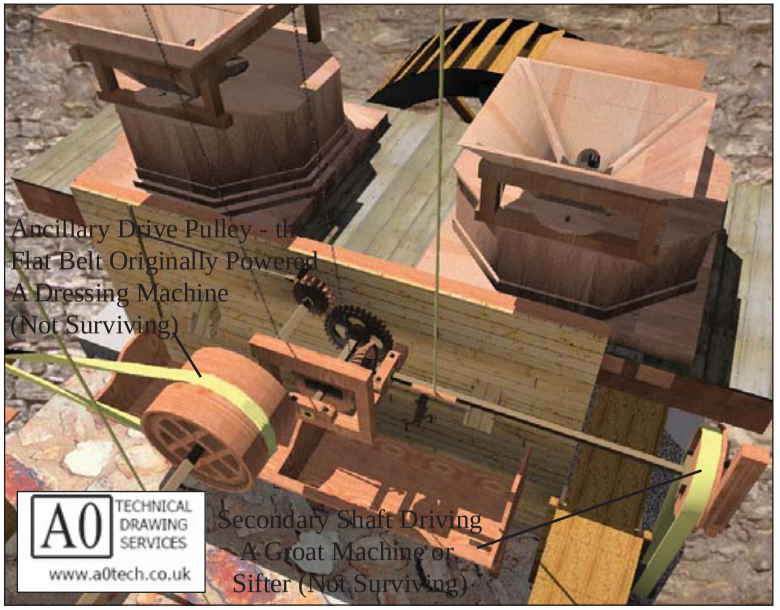


Figure 78. 3-D Diagram of First Floor Level Machinery (Produced by & Copyright A0 Technical Drawing services)



Figure 79. Kiln Interior - Ground Floor.
Now Used as a Kitchen



Figure 80. Kiln Interior - First Floor.
Now Used as a Bathroom



Figure 81. Kiln Interior - First Floor.
Now Used as a Bedroom. Kiln Vent is Located in Ceiling



Figure 82. Kiln Interior - First Floor Bedroom.
Restored Wooden Slatted Cupola Vent in Ceiling



Figure 83. Salvaged Perforated Tiles From the Rhyd Hir Kiln

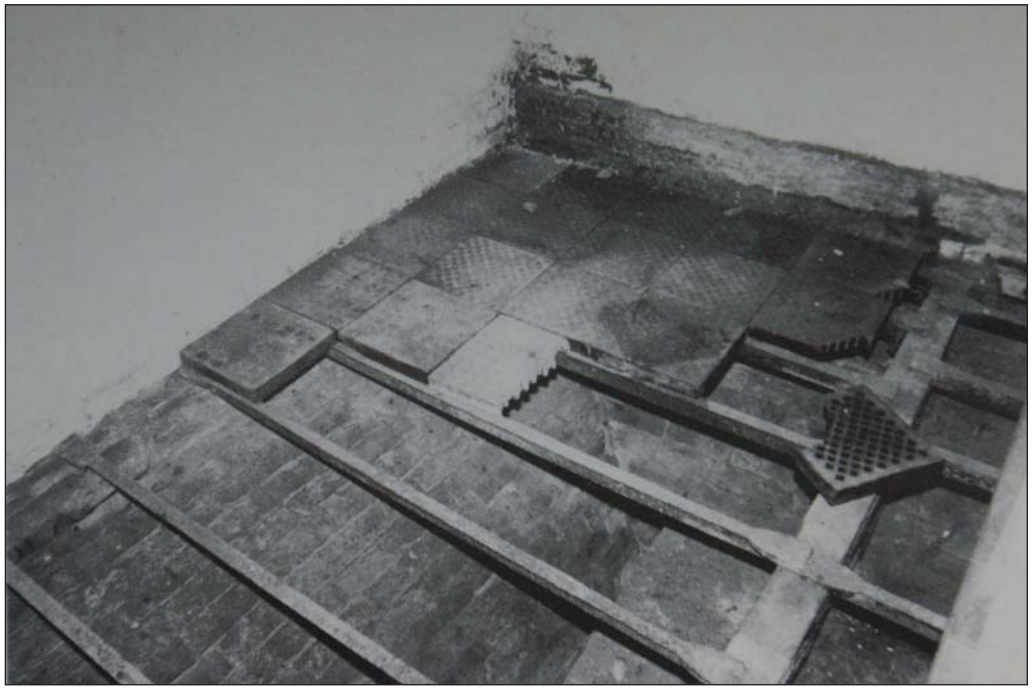


Figure 84. Kiln Floor with Wrought Iron Joists and Perforated Clay Tiles (Bunburt Mill, Cheshire). After Watts 1983: 18.
A Similar Floor Would Have Existed at Felin Rhyd Hir

7.3 The Miller's House

The preservation of the miller's house is poor and the structure is now derelict. Only the north-western gable wall is preserved to its original height, whilst the front elevation survives to first floor level. This alteration in height was necessary in order to make the building safe following the destabilising effects of the removal of the rear bank and the 1984 earthquake. The second floor was removed in 2010 as the building had become unsafe. The original building materials, including the roofing slates, have been retained by the owner and it is hoped that the second floor will be rebuilt as part of a programme of works on the site.

The single storey appearance of the miller's house in its current state has a negative impact on the aesthetics of the site as it was originally built as one of a pair of structures. The house and mill were designed as a whole range, built using the same materials and almost mirror each other. They should be viewed and understood as two parts of one whole rather than as two separate buildings. This is evident from the photographs and drawings showing the miller's house prior to the removal of the second floor (see Figures 19, 24 – 25).

Close examination of photographs taken in the late 1980's show that the miller's house had a king-post roof structure and as previously mentioned there are a number of blocked fireplaces in the surviving gable wall. The windows surviving at ground floor level have been raised as is evident in the stonework below them. When one considers the blocked up fireplaces in the surviving gable wall and Figure 23 it appears that either the house originally had a chimney breast at either end, or that the chimney position was moved at some point during the building's use.

Figures 85 – 96 detail the current status of the miller's house including all surviving elevations.

7.4 The Stables

The stables have clearly been built against the north-west gable wall of the miller's house and are of a later date than the house and mill. The structure is not shown on the 1841 tithe map but is marked on the 1887 First Edition Ordnance Survey Map, allowing us to conclude that it was built at some point between these two dates. The style of the building is in keeping with that of the existing buildings and extends the structure in a linear direction respecting the line established by the house and mill. It too was dug into the rear bank.



Figure 85. Aerial View of the Miller's House



Figure 86. Aerial View of the Miller's House



Figure 87. Aerial View of the Miller's House Showing Blocked Fireplaces in the Surviving Gable End



Figure 88. Aerial View of the Miller's House Showing Alterations to Window Heights



Figure 89. Miller's House Front Elevation



Figure 90. Rear Elevation of Miller's House and Stable



Figure 91. North-Western Gable Elevation of Miller's House



Figure 92. Interior View of Front Elevation of Miller's House Detailing Change in Window Heights



Figure 93. Miller's House and Stable Front Elevation



Figure 94. Miller's House Front Elevation Showing Old Millstone Incorporated as Front Doorstep



Figure 95. Miller's House Front Elevation



Figure 96. Miller's House Front Elevation

The stable is well constructed of local stone with a slate roof – the same materials used elsewhere in the mill complex (Figures 97 – 100). It has a carefully laid cobble floor which represents a clear investment of effort in creating an attractive space (Figure 103 – 104). The wooden hay rack to the rear of the stable survives (Figure 102). The building has a whitewash finish.

7.5 The Cookhouse

The cookhouse (Figure 105 – 108) is located perpendicular to the mill house and stable. It is attached to four large pigsties. As with the stable the cookhouse and pigsties do not appear on the 1841 Tithe Map but are marked on the First Edition O.S Map. These buildings are all very similar in appearance and may represent a secondary phase of investment in the mill complex, providing the tenants with a means to supplement their income. It is interesting to note that census returns after 1871 list the occupations of the household heads as farmers and millers rather than millers, and we know that they are working an area of 16 acres.

The interior of the cookhouse (Figures 107 – 108) would originally have been open plan, although a bathroom has been inserted into the structure. An inglenook fireplace, originally housing a large cooking range, was located against the rear wall of the room and a large vat was located to the left of the fireplace. The vat is believed to have been utilised in the production of molasses and other pig foodstuff with waste material from the milling process. Local eyewitness accounts state that the miller was not paid for running the mill but received benefit in kind in the form of foodstuffs for the pigs which were reared on site and sold on.

7.6 The Barn

The current metal barn structure at Felin Rhyd Hir is clearly a modern construction but an examination of the interior reveals that, as with so much of the complex, a huge amount of historical material is preserved. The remains of the pigsties are housed within and Figures 108 – 114 show surviving structural details.

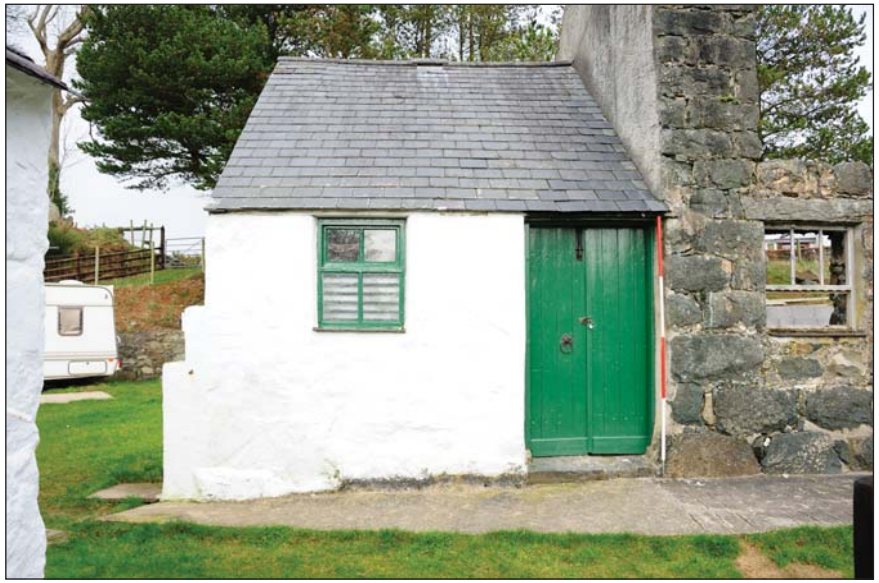


Figure 97. Stable Front Elevation



Figure 98. Stable Front and Side Elevation

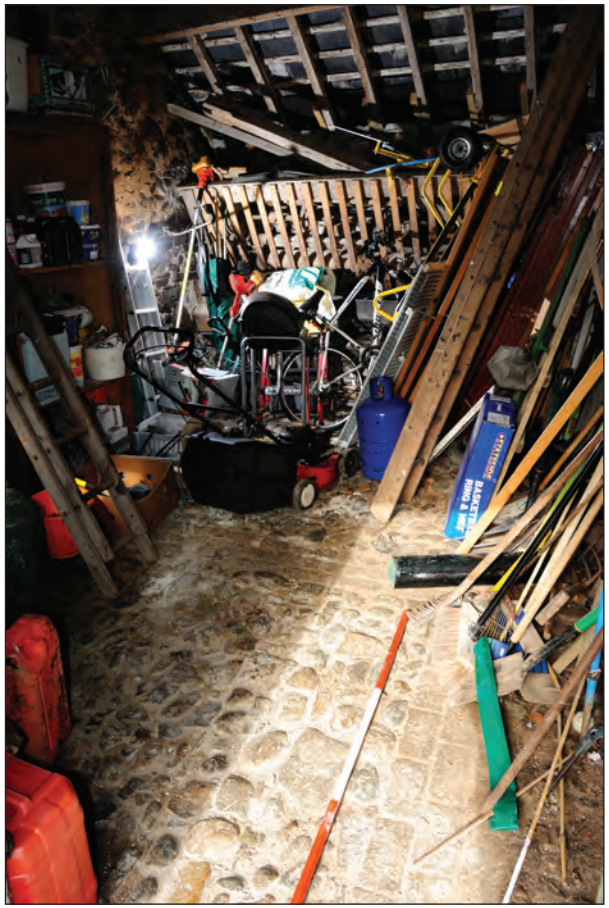


Figure 99. Stable North-Western Elevation



Figure 100. Stable Rear Elevation





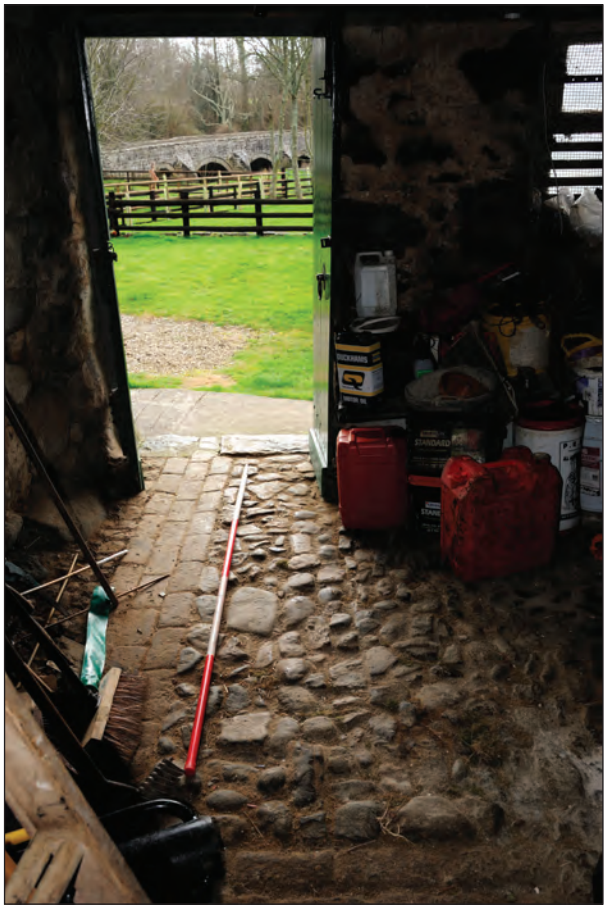


Figure 101. *(Above)* Stable Interior - Hay Rack

Figure 102. *(Left)* Interior of Stable Taken From Door

Figure 103. *(Far Left)* Interior of Stable Taken from Back of Room



Figure 104. Cookhouse Front Elevation



Figure 105. Cookhouse South-Eastern Elevation



Figure 106. Cookhouse Interior - Large Boiler was Once Situated in Area Now Housing Television Set



Figure 107. Cookhouse Interior
Large Fireplace Once Contained Cooking Range



Figure 108. Modern Barn Front Elevation



Figure 109. Broken Millstone Made of a Conglomerate Stone - Possibly Quarried on Anglesey



Figure 110. Surviving Stonework Hidden Inside Modern Barn Covering



Figure 111. Surviving Stonework Hidden Inside Modern Barn Covering



Figure 112. Survivng Stonework and Architectural Details Hidden Inside Modern Barn Covering



Figure 113. Survivng Stonework and Architectural Details Hidden Inside Modern Barn Covering

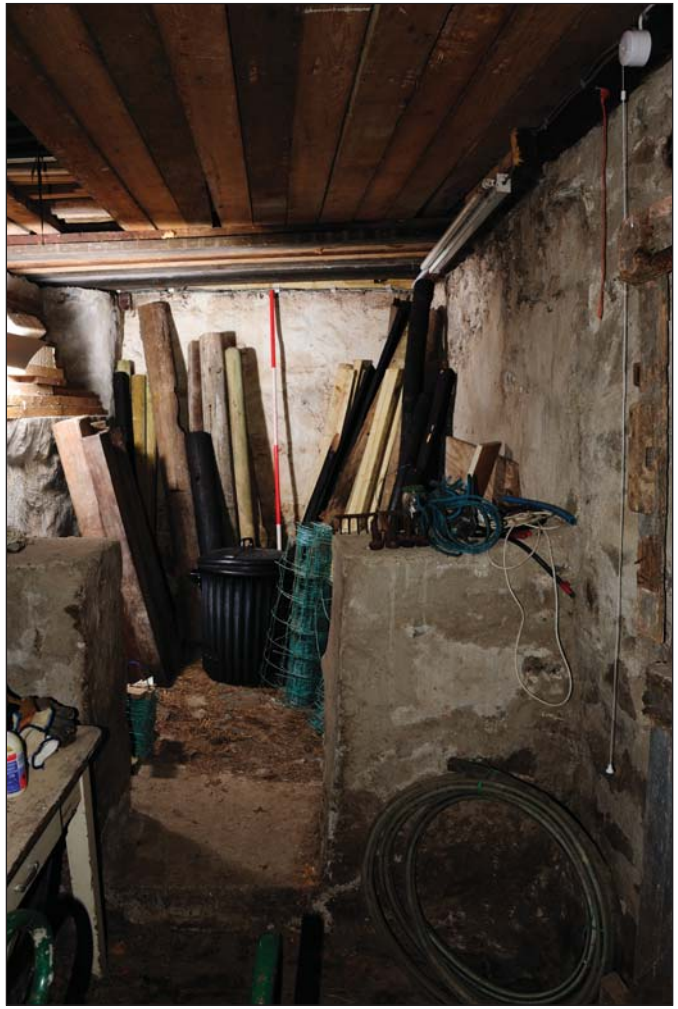


Figure 114. Survivng Stonework and Architectural Details Hidden Inside Modern Barn Covering

8.0 Conclusion

The Felin Rhyd Hir mill complex has a long and fascinating history, potentially dating back as far as the late thirteenth century and it is likely to have been the site of one of the earliest known watermills on the Llŷn Peninsular. No physical evidence dating from this period was uncovered during the excavation and it is speculated that the mill race, pond and wheelpit are the earliest site elements although no secure date can as yet be assigned them.

Following extensive evaluation of all available sources the author considers that the mill/kiln structure and the miller's house are contemporary and were built as a pair of industrial buildings in the late eighteenth century. The mill is likely to have been rebuilt on or near the footprint of previous phases of mill. No evidence was found to support the suggestion that a previous phase of mill once stood where the miller's house is now situated.

Documentary research has conclusively shown that there were structures built between the mill and miller's house dating back at least as far as 1887. The remains of one such structure was uncovered during excavation. The evaluation trench revealed that the area contained within the footprint of the proposed extension to the miller's house contained archaeological remains of nineteenth century and later date.

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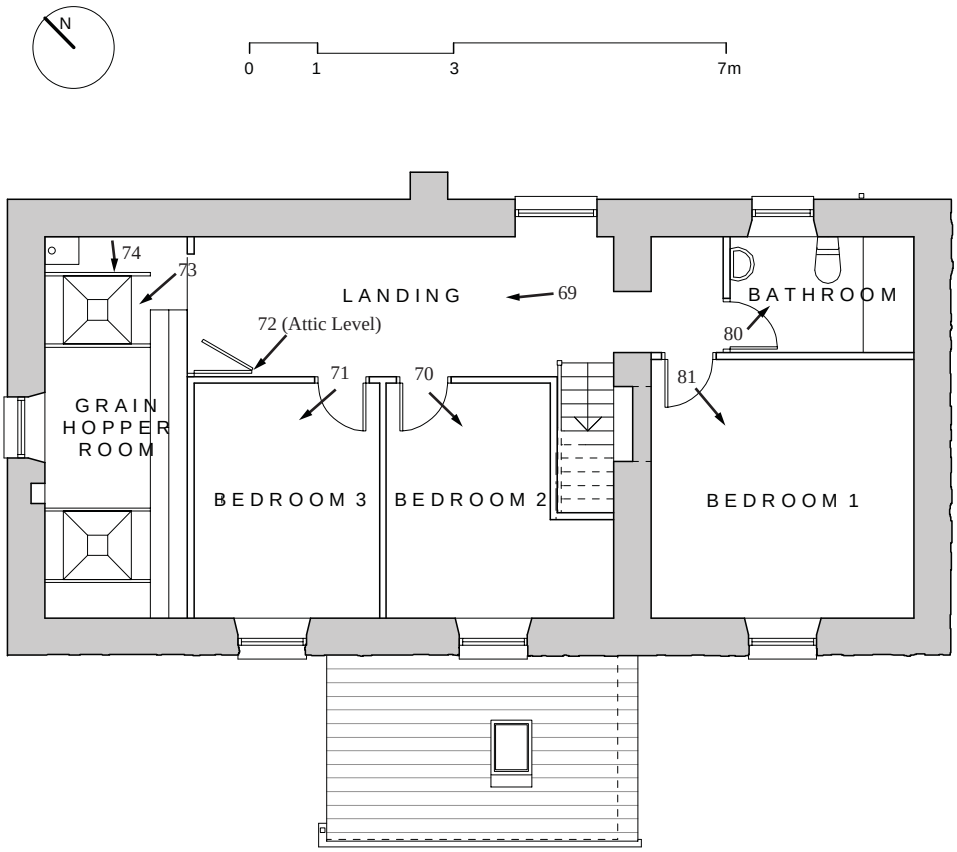
www.heneb.co.uk/llynhlc/thematicessays/communications.html

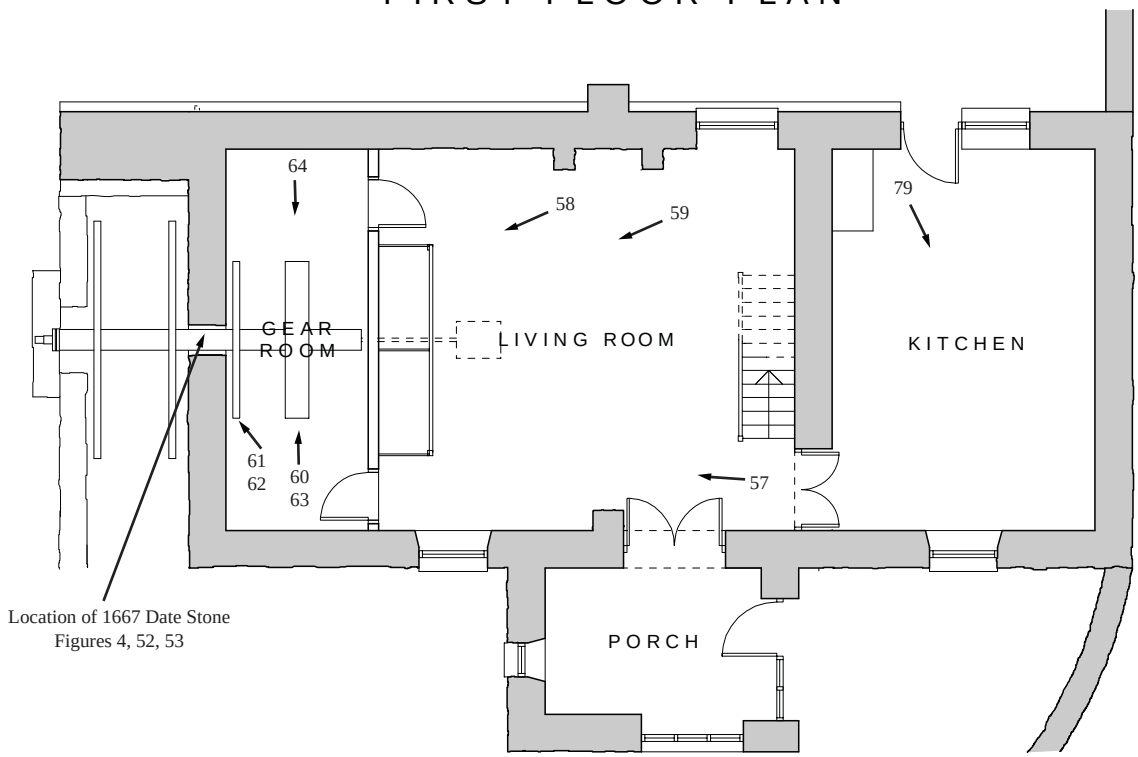
Appendix A.

Context Description List

Context Number	Context Description	Dimensions
01	Modern overburden, building rubble. Contained a surprisingly large amount of artefactual material in particular glass and ceramics	7.0m x 5.0m Max depth 0.25m
02	Brick surface – outbuilding floor or hard-standing for some form of machinery associated with the waterwheel	Maximum area covered: 2.7m x 2.2m Max depth c.0.24m
03	Compact layer of hard-standing – contained modern material such as soft drinks cans	Maximum area covered: 5.7m x 2.0m Deposit not excavated
04	Orange sand/gravels – probably natural but may be redeposited	Unexcavated not fully exposed in plan
05	Remains of stone retaining wall which held back the bank behind the house and mill. As with the buildings themselves this wall has no footings and was built directly on the ground surface	Maximum area exposed 1.0m x 2.0m Max depth 0.26m
06	Cut of modern trench dug against millers house wall. Excavated as part of current scheme of building restoration. Filled by (07)	7.0m x 0.5m Depth 0.15m
07	Grey-green gravel fill of trench [07]	7.0m x 0.5m Depth 0.15m
08	Concrete raft for garage – modern built after 1970	Area covered 2.2m x 0.6m Max depth 0.20m
09	Stone rubble – collapse dump of material below (03)	Maximum area covered: 3.0m x 2.6m Deposit not excavated



FIRST FLOOR PLAN



GROUND FLOOR PLAN

Appendix B. Plan of Mill/Kiln Structure Showing Photograph Positions