

A Horse-Engine House from Priestley Farm, Flitwick

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For many centuries horses, together with wind and water, were a principal means of obtaining power, and for some purposes they were used after the invention of the steam-engine and even the internal-combustion engine.¹ The early medieval development of (literally) harnessing this power, together with the development of nailed horse-shoes and of the whipple-tree, had a considerable significance for the growth of agriculture.² The adoption into scientific terminology of the (now superseded) term 'horse-power' was a measure of the horses' importance as a provider of power, as indeed is the (now usually metaphorical) phrase 'harnessing power'. The obvious use of the horse as a power-provider lies in pulling carts and wagons and in drawing ploughs and other implements of the field. A probably later development was the invention of machines — horse-engines — by which rotary power was provided by having the horse walk in a circle, the horse-engine allowing the power to be transmitted to some mechanism. Horse-engines of this type are an important aspect of industrial development. One of their commonest applications in certain areas was for winding men and coal from the coalmines, and in the early seventeenth century the cog-and-run gin was developed for this purpose, followed towards the end of the century by the whim-gin, working on a rather different principle.³ Other horse-engine machines could be used for various crushing or mixing jobs, for example in butter-making, cider-making, brewing, or brickmaking.⁴ A further use of great importance was in working thrashing-machines and similar machines on the farm. The thrashing-machine was perfected, if not invented, by the Scotsman Meickle in the late eighteenth century, the first effective machine being constructed at Kilbogie, Clackmannanshire in 1786; this machine, which involved a revolving drum to separate the grain from the ears, superseded an earlier type using rotating flails.⁵ In some parts its introduction was accompanied by Luddite-like machine-wrecking by men who feared for their livelihoods.⁶ The machines could be used for a variety of thrashing and cutting jobs on the farm, and required care on the part of the boy walking the horse; for if the horse walked too fast 'the

old machine started to revolve like fury. Then there was some swearing', for that could be dangerous for the man feeding the machine. 'If the old horse started a-loitering, on the other hand, . . . the chaff-cutting [or whatever] wouldn't go forward.'⁷ In some areas it was usual for the horse-engine to be housed in an apsidal, polygonal, or square outbuilding to the barn;⁸ but elsewhere this was not the case: Evans describes a typical Suffolk example of a chaff-machine as 'geared to a capstan-like arrangement in the yard outside.'⁹ So far as present research goes, horse-engine houses seem to be commonest in northern England and southern Scotland and in parts of the West Country,¹⁰ suggesting that they may have been provided for climatic reasons, horse-engines being more commonly in the open in the more south-easterly parts of the country.

Thomas Batchelor's 1808-survey of Bedfordshire agriculture includes a section on 'Thrashing-mills', from which it is clear that they existed at Biggleswade, Dunton, Little Staughton, Mogerhanger, Tempsford, Old Warden, Woburn (which had three), and perhaps at Harrold.¹¹ In addition there would have been other horse-engines used for purposes other than thrashing and the like — for example at the numerous brickfields in the county.¹² It will be clear from what has been said that the existence of these machines cannot be taken to imply the existence of buildings to house them. Indeed, Batchelor mentions explicitly that at Little Staughton 'The horses walk in the open air . . .'.¹³ Horse-engine houses, in fact, seem not to have been at all common in the county. Part of a sandstone wall of what *may* have been a horse-engine house at Eggington has been observed. This is now part of a storage-building at the entrance to Claridge's Farm (SP 954251); the upper part of the surviving half of the curved wall is now rebuilt in brick; the example, however, is not certain. The only certain example was that at Priestley Farm, Flitwick (TL 020331). In the early part of 1973 this example was badly damaged by fire, and the writer was invited by K. Fadden of the Ampthill and District Archaeological Society to record the building; a week after the survey was made the building was demolish-

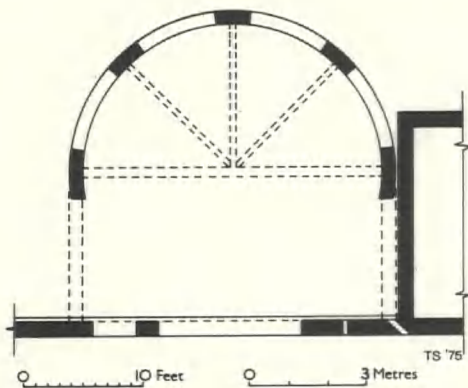


Fig 1 The Horse-Engine House at Priestley Farm, Flitwick

ed.¹⁴ It may have been Bedfordshire's only example.

The horse-engine house was built against the side of a large barn – doubtless a thrashing-barn – and was of the common half-round (apsidal) plan; its external diameter was 8.5m. (28ft).¹⁵ The walling was of coursed dressed ironstone, available locally and much used for both late vernacular and supra-vernacular buildings within the area. In the 'apse' were four large openings of a single square order with sawn limestone slabs for sills, the heads of the openings being formed by the soffit of the curved timber wall-plate. The wall-plate continued beyond the ends of the 'apse', over the two large spaces between 'apse' and barn (fig 1). The top-most courses of the wall had been rebuilt at some time, but in their original form, and the roof had been raised at some time, as was indicated by the scar of a former, and lower, roof against the side of the barn.

By the time of the survey the horse-engine house contained none of its machinery and had been used for storage. The central vertical axle or centre-post would have been carried at its head in the soffit of a horizontal beam running across the top of the structure, the beam-holes for which remained although the beam itself had gone. In order to accommodate these beam-holes in such a way that the beam passed through the centre of the 'apse' the latter was made slightly greater than semi-circular (fig 2). The southern (but not the northern) beam-hole had a timber plate for the beam's end to rest on.

The roof had a tie-beam, not quite centrally placed, with a central king-post with joggle-pieces from which rose raking-struts to the rafters. Subsidiary raking-struts rose from the tie-beam to in-pitch side-purlins. A series of radiating horizontal beams (which functionally were not tie-beams) arranged around the 'apse' (fig 2) also carried subsidiary struts to the purlins. There was a ridge-board running between the centre of the 'apse' and the side-wall of the barn. The roof-covering was of Welsh slate with angle ridge-tiles. The eaves projected markedly – some 23cm (9in).

The barn wall had two large openings – 1.1m (3½ft) and 2.6m (8½ft) wide (fig 1) – through the larger of which the horizontal tumbling-shaft to the thrashing-machine would have passed. Further south was a long vertical slit-opening, its sill having been considerably scored by ropes or chains; the purpose of this opening is not entirely clear. Close to it was a further opening – square, fairly high up in the wall and running into it obliquely; it was partly blocked at the time of the survey.

The horse-engines contained within buildings of this type could be worked by two, four, or even more horses, and that at Old Warden, Beds. could be worked either by two horses or by four oxen.¹⁵ The horses walked round a circular path, led by a boy, and were yoked to horizontal beams radiating from the crown-wheel at the top of the centre-post or from the centre-post itself; these beams were normally strutted.¹⁶ The crown-wheel was toothed and engaged a further cog on the tumbling-beam, which ran above the level of the horses' heads. Occasionally, by way of contrast, the shaft passed under the horse-path, as at Little Staughton, Beds.¹⁷ The daily expenses involved in running a four-horse-engine at the beginning of the nineteenth century are given by Batchelor, his example being one of the engines at Woburn.¹⁸

	s. d.
4 horses, at 2s. 6d.	10. 0.
A lad to drive	9.
3 men to feed (the thrashing-machine) and attend the boys, at 1s. 6d.	4. 6.
2 boys to bring forward the corn, and back the straw, at 6d.	1. 0.
Interest of the expense of the machine, and for repairs 10% on £365	2. 0.
	18. 3.

NOTES

- 1 There are several general accounts of horse-power e.g. K. Hudson, *Industrial Archaeology: an Introduction*, 1963, 88-90; A Raistrick, *Industrial Archaeology: an Historical Survey*, 1973, ed., 93-4 and 111-13.
- 2 Cf. L. White Jr., 'The Expansion of Technology 500-1500', in C.M. Cipolla (ed.), *The Fontana Economic History of Europe: 1, The Middle Ages*, 1972, 151-3.
- 3 A.R. Griffin, *Coalmining*, 1971, 30-32; the coal-mining gins were not normally enclosed in a horse-engine house.
- 4 Raistrick, 1973, 112.
- 5 G.E. Fussell, *The Farmer's Tools*, 1952, 156-62; J.A. Hellen, 'Agricultural Innovation and Detectable Landscape Margins: the Case of Wheelhouses in Northumberland', *Agric. Hist. Review*, 20, 2, 1972, 141.
- 6 G. Ewart Evans, *The Horse in the Furrow*, 1967 ed., 116; cf. N. Harvey, *A History of Farm Buildings in England and Wales*, 1970, 137: 'By the 1820s, mechanical threshing was widespread practice, as the Luddite riots of the labourers whom it deprived of their precious winter work as flailers showed so pathetically,' and 152, n. 61: 'By 1827 attacks on threshing machines were sufficiently common to make necessary an Act imposing a seven years transportation on those who damaged them.'
- 7 Evans, 1967, 27-8, describing a chaffing-machine. T. Batchelor, *General View of the Agriculture of the County of Bedford*, 1808, 199 states that the horse-engine at Old Warden worked a machine which could be used for chaffing or for thrashing; one of the machines at Woburn could be used as a grinding- or bolting-mill as well as (primarily) a thrashing-machine (p 203).
- 8 Hellen, 1972, 141; R.W. Brunskill, *Illustrated Handbook of Vernacular Architecture*, 1971, 142-9 Evans, 1967, 27.
- 10 K. Hutton, speaking at a conference of the Vernacular Architecture Group, London, 14-15 December 1974; see K. Hutton, 'The Distribution of Wheelhouses in the British Isles', *Agric. Hist. Rev.*, 24, 1976, 30-35; and see F. Atkinson, 'The Horse as a Source of Rotary Power', *Trans. Newcomen Soc.*, 33, 1960, 46. For some northern examples see A. and J.K. Harrison, 'The Horse Wheel in North Yorkshire', *Bull. Cleveland and Teesside Local Hist. Soc.*, 8, 1969, pages unnumbered, reprinted in *Indust. Archaeol.*, 10, 3, August 1973, 247-65; and J.A. Hellen, 'Some Provisional Notes on Wheelhouses and their Distribution in Northumberland', *J. Geog. Soc. Univ. Newcastle-upon-Tyne*, 18, 1970, 19-29; and Hellen, 1972, 140-54.
- 11 Batchelor, 1808, chap 5, section 7, pp 198sqq.
- 12 The inventory of Robert Hill, shoemaker of Cloghill, presented to the Archdeacon's Court 13 April, 1619, includes: 'Item His Horse Mill with other small things in the mill house 53s. 4d.', *Beds. Hist. Rec. Soc.*, 20, 1938, 138 (Inventory no 155); a brewery at Luton also had a horse-engine: Sale catalogue of Park Square Brewery, 4 February 1858, Lots 140-151, Bedfordshire County Record Office, document, X95/252.
- 13 Batchelor, 1808, 198. An illustration of such an open-air horse-engine, of the type with crown-wheel just above ground-level and being used to work a thrashing-machine, is reproduced in Harvey, 1970, 121 top.
- 14 *Ex. inf.* K. Fadden; there is a drawing of the building in [T.R. Key], *Flitwick: a Short History*, 1973, 18.
- 15 Batchelor, 1808, 200.
- 16 Cf. Hellen, 1972, 142.
- 17 Batchelor, 1808, 198.
- 18 Batchelor, 1808, 204.

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