

SCOTTISH WINDMILLS – AN OUTLINE AND INVENTORY

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INTRODUCTION

THE object of this paper is to outline briefly the history, development and distribution of the windmill in Scotland.¹ The paper is subdivided into two main sections. Part I serves as a general introduction to Scottish windmills, while part II provides an interim inventory of both windmill survivals and selected sites where mills are known to have existed. The work is based primarily on observations made in the field, backed up wherever possible by documentary evidence from maps and other record material. In addition, a considerable amount of information was obtained from personal communications with individuals, and these and other sources are duly acknowledged throughout the text. The basic field work was carried out during the last few years in the course of survey work on behalf of the Scottish Committee for Industrial Archaeology. The survey of windmills was extended by the authors, and this present paper is the result. It will be obvious that the inventory, in particular, cannot be regarded as definitive, but at the same time the authors have made every effort to present a survey which is as complete as possible. Being more concerned with the rural landscape, the result can hardly claim to be a pioneer work on Scottish industrial archaeology, but it is hoped that its method and presentation will provide a guide-line for similar surveys on specific aspects of more recent rural and industrial remains.

ACKNOWLEDGMENTS

We wish to thank Mr David H. Fergus, who has carried out research on Scottish windmills, and kindly provided us with much valuable general information. A retired millwright, Mr James Reid, put his wide knowledge at our disposal and notified several sites which would otherwise have escaped record. Mr Alexander Fenton, Mr Basil Skinner, and Mr Angus Graham likewise gave us valuable information on specific sites, including photographic records. Mr A. E. Truckell, Miss E. McCaig and Mr G. H. Brebner helped us in locating certain sites and in providing histories of mills known to them. We are most grateful to Mr Rex Wailes, who first suggested to the Scottish Committee on Industrial Archaeology the value of a windmill survey and to Dr John Butt and Mr John Hume, who co-operated in many ways during field work and writing.

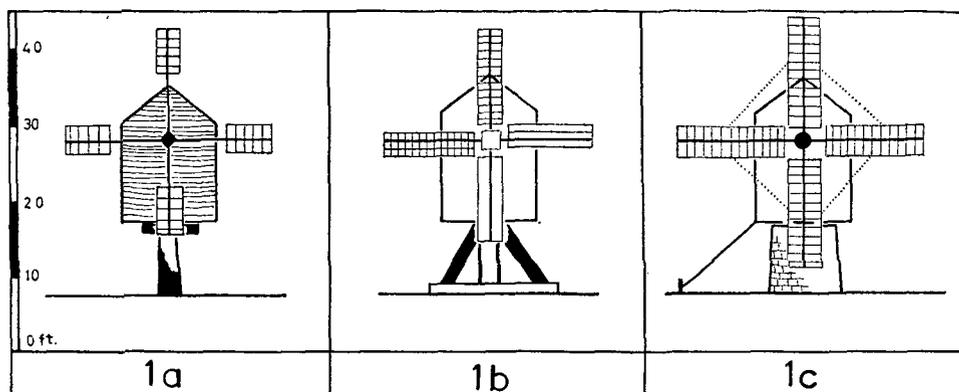
PART I – THE WINDMILL IN SCOTLAND

Development and Types

The development of the windmill in Scotland was, with a few notable exceptions,

¹ A preliminary survey was carried out by Thomas McLaren in his paper 'Old Windmills in Scotland', *P.S.A.S.*, LXXIX (1944-5), 6-14.

roughly parallel in all but time to that elsewhere. It was a late arrival and the earliest reference to one is at Largo in the mid-fifteenth century. Undoubtedly it was introduced from England and Holland from the fifteenth century onwards and became more common in succeeding centuries. The first period of concentrated building seems to have been in the mid and late seventeenth century, for there are several notable survivals of that date. The era of greatest activity was certainly the late eighteenth and early nineteenth century, when high technical achievement combined with the boom in cereal production, contributed much to the successful development of both wind and water mills. There are a number of fine remains of this period. With the growth of steam power most windmills gradually fell out of



FIGS. 1a-1c. The development of the post mill - simple post mill, tripod post mill, turret post mill

use by mid-nineteenth century. Others survived by being converted to steam or suction gas power and a few continued working as windmills even into the twentieth century. These survivors fell into disrepair and were stripped of their sails and machinery during the early decades of this century. Thus in view of the late introduction of the windmill to Scotland, the relatively small number which were erected during the sixteenth-nineteenth centuries (about 100 altogether), and the rapid technical changes which took place in the wake of greatest constructional activity, it is indeed surprising that as many as 40 mills have survived until the present time. All of the survivals are simply windmill stumps or towers, none of which have sails or windcap, and few of which have much machinery. Yet from the remains it is possible to reconstruct an outline of development, structure and distribution, and to attempt a classification of the various types of windmill which existed in Scotland.

Scottish windmills developed in general from the primitive post mill of the fifteenth century to the complex tower mill of the late eighteenth century.¹ This technical progression and refinement was broadly similar to that in England and elsewhere, although specific comparisons can be drawn between developments in

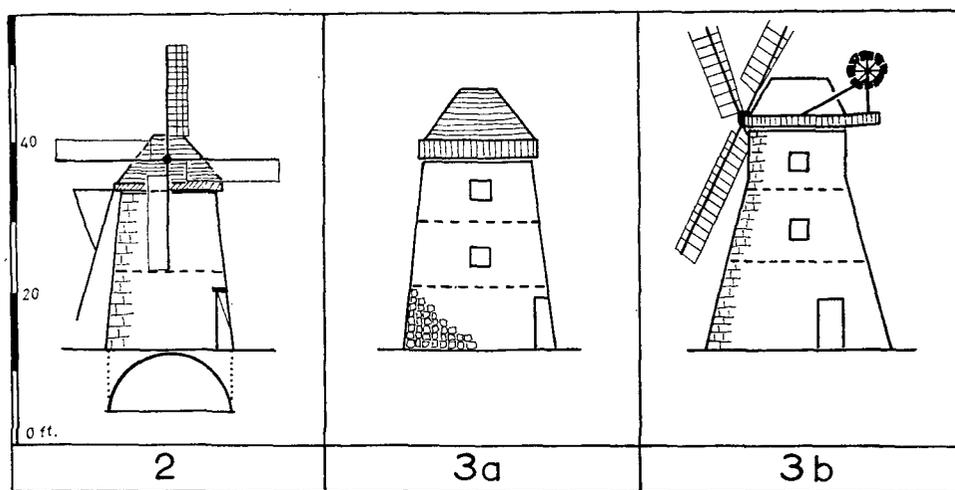
¹ The development of windmills is outlined in Bennet, R., and Elton, J., *A History of Corn Milling*, II (1899), Watermills and Windmills, 244-320; and in *History of Technology*, III (1957), section 4, *Windmills* (by Rex Wailes), 89-109.

Scotland and those in other areas of Britain and Europe where windmills were common. Since the windmill arrived later in Scotland, the primitive forms, common in medieval England, were quickly superseded by more advanced structures. Figs. 1a-3b show the course of these developments in structure, and Table I outlines the main periods and features of each class of windmill. The numbered figures correspond to the class numbers.

TABLE I

WINDMILL TYPES

<i>Class No.</i>	<i>Type</i>	<i>Dating</i>	<i>Descriptive Features</i>
1a	Post mill	16 & 17 c.	Wooden, box-like mill, built round central post or shaft; entire mill could be turned to suit wind direction; normally 4 sails.
1b	Tripod post mill	16 & 17 c.	Similar to 1a, but central post supported by timber shafts.
1c	Turret post mill	18 c.	Post mill of wooden construction raised and supported on turret of brick or stone.
2	Vaulted tower mill	17 & 18 c.	Small tower mill built on artificial mound, with vaulted stone cellar; wooden windcap supporting 4 sails.
3a	Early tower mill	17 & 18 c.	Early development of tower mill, 3b; massive stonework supporting windcap; 4 or more sails; wooden machinery.
3b	Tower mill	18 & 19 c.	Tower mill, often large and millwright built; 3 or 4 floors with windcap; 4 or more sails plus automatic fantail; wooden and cast-iron machinery.
4	Orkney & N. mainland	19 c.	Crude mill driven by 4 or 6 sails supported on wooden superstructure; machinery housed in building beneath; often built by amateurs.
5	Shetland horizontal	?	Crude adaptation of horizontal water-wheel; sails set lower than grinding apparatus.



FIGS. 2-3b. The development of the tower mill - Scottish vaulted tower mill, simple tower mill, large tower mill

The earliest mill was the post mill (figs. 1*a* and 1*b*), although it is not known with certainty whether they ever existed in any large numbers. Probably the early mills of the east coast ports and their hinterlands were post mills, and one is recorded in Dumfriesshire as late as 1670.¹ The post mill was rapidly superseded by the tower mill, which appeared in the seventeenth century. It had two main forms, the simple tower mill with vaulted cellar (fig. 2), and the larger tower mill (fig. 3*a*). The latter developed into an even larger and more refined structure, with more complicated machinery, becoming the eighteenth-century tower mill (fig. 3*b*), which represents the highest technical stage reached by the Scottish windmill. This structural evolution was largely related to advances in millwrighting, both in Scotland and elsewhere. It also illustrates the wright's efforts to construct a mill which was both simple and of high mechanical standard. The tendency for mills to become larger and more complex was also related to the miller's desire for more space and output. In addition, greater safety and efficiency necessarily involved improvements in structure and mechanism over a long period of time.

The commonest and earliest surviving mill was the vaulted tower mill, apparently a type peculiar to Scotland. Essentially this was a fixed tower surmounted by a movable cap which supported the sails. The windcap was turned into the wind by hand. The structure, built of local materials, often stone rubble, stood on an artificial mound over a stone-built vaulted chamber or cellar. The latter often extended outwards from the base of the mill and provided a third floor, which acted as a receiving and dispatching room. An interesting reconstruction of this type of mill appeared in Thomas McLaren's paper.² Examples survive at Gordonstoun, Dunbarney, Dysart, Hillhouse, Balgone Barns and Monkton, among others. McLaren also provided a very full description of the structural and mechanical features of the vaulted tower mill at Dunbarney, which is generally applicable to all mills of this class.³ This type of windmill probably has parallels in some of the early English and Irish tower mills, though none seem to have featured the vaulted chamber.⁴ The 'petit pied' windmills of Brittany, which were two-storied structures of comparably massive stonework, also resemble early Scottish mills.⁵

Large tower mills were a natural development of the vaulted type. In this mill three or four floors were incorporated inside the tower, thus removing the need for a basement. At first the structures remained massive and the machinery as simple as before, but during the eighteenth century many refinements were made in layout. During the mid and late eighteenth century a large number of tower mills were erected in Scotland. It seems probable that the majority, like those in Ireland, were constructed by local millwrights and masons, using local materials, but working on basic designs from the north of England.⁶ Several date from the 1780s and 1790s.⁷

¹ Information from Mr A. E. Truckell, Dumfries Museum.

² *P.S.A.S.*, LXXIX (1944-5), 9, fig. 2, and 11, fig. 3.

³ *ibid.*, 7-8.

⁴ For outline development of English windmills see Wailles, R., *Windmills in England - a study of their origin, development and future* (1948). Mills in a specific area of Ireland are dealt with in Green, E. R. R., *The Industrial Archaeology of County Down* (1963).

⁵ *History of Technology*, III (1957), 95.

⁶ Rhodes, P. S., *Ballycopeland Windmill, County Down* (1962), 2.

⁷ This was the period of greatest building and renewal of watermills in Scotland, a time of high corn prices.

Fine examples are to be found at Hilton, Bridgeness, Myrehead, Bielside, Swinton, Carluke, Mouswald and Dumfries.

Several anomalies appear in the pattern of development in Scotland, resulting from the fact that early or primitive windmill types were adapted at a later date and structures erected based on earlier techniques. Outlying areas, such as Gallo-way, the North-east, Caithness, Orkney and Shetland provide examples of this situation. Several turret post mills (fig. 1c, class 1c) were erected in the eighteenth century, and there are diminutive survivals at Stoneykirk and Sandend. Others of this type existed in Orkney, including a very fine one at Peckhole, North Ronaldsay, which only ceased operation in the first decade of this century. More primitive still

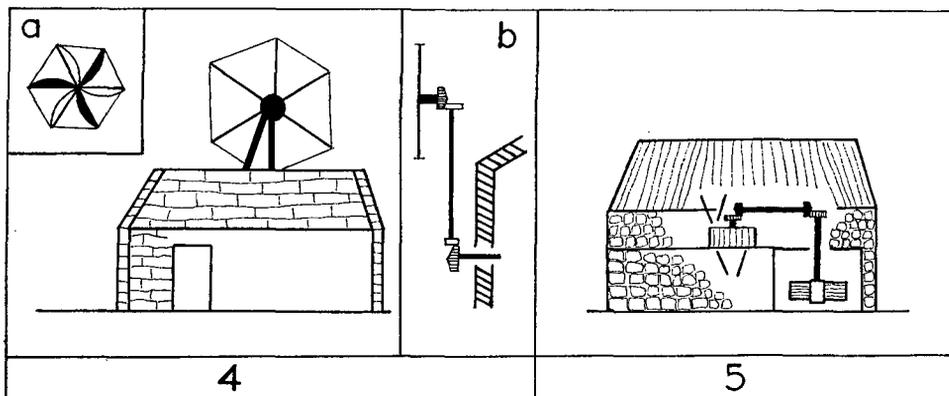


FIG. 4. The Orkney windmill
FIG. 5. Reconstruction of Shetland horizontal mill

were the amateur mills found on Orkney farms during the nineteenth and early twentieth centuries.¹ These crude mills (fig. 4, class 4) were driven by four to six canvas sails, and provided power for small meal mills. The arrangement of the sails and a reconstruction of the main drive mechanism shows how primitive these mills were (fig. 4, inset *a* and *b*). Mills of this type were also found on the mainland in Caithness. In Shetland there was at least one horizontal mill (fig. 5, class 5), a crude adaptation of the horizontal water mill or 'clack mill' in a waterless area. In this type, of which one known example existed on Havra, the sails were set lower than the grinding apparatus.² There are also records of other types of horizontal windmill in Scotland, most of which seem to have been largely experimental.³ There was a notable horizontal windmill at Dunbar in the eighteenth century, which had four sails, and near Elie in Fife 'several windmills on the horizontal construction were employed in grinding indigo' at the end of the same century.⁴

Thus the Scottish windmill, despite its short existence, developed broadly along the same lines as elsewhere in the British Isles. By the late eighteenth century probably as many as 50 were in operation, the largest number at any single period.

¹ We are grateful to Mr A. Fenton for information on Orkney mills.

² See Venables, U., *Life in Shetland* (1956), 97-98.

³ Horizontal mills in general are outlined in Bennet and Elton, *op. cit.*, 326-7.

⁴ Fairbairn, W., *Treatise on Mills and Millwork* (1864), 1, 285.

Yet with the coming of the Industrial Revolution and the rapid development of the steam-engine and iron machinery, nearly all of them fell quickly into disuse and ultimate decay.

*Layout and Machinery*¹

The basic layout and machinery of the Scottish windmill remained simple throughout its period of existence. The tower mill, which was by far the commonest, was a solid structure of stone about 25 to 50 ft. high, with a tapering shape from bottom to top. The earlier vaulted types were often a little smaller, from 15 to 30 ft. in height, with a chamber extending 10 to 20 ft. outwards from the base of the tower. The internal diameter was anything from 10 to 20 ft. and it was this which determined how much space was available within the mill. The tapered shape prevented the tower becoming top heavy or distorted, but the thick walls (1½ to 3 ft.) restricted the space on the top floors, although it resulted in a roomy ground floor where movement was considerable and space at a premium. Sometimes the exterior of the windmill was tarred or stuccoed to prevent the wet from penetrating. The windcap acted as the roof and this had to be well constructed so that the mill was weathertight.²

Early tower mills commonly had two floors, the upper floor housing the wind-shaft and main shaft, and also supporting the windcap and associated machinery.³ The drive to the ground floor and the millstones was through a large spur from above. Hoppers carried grain to the stones and a chute conveyed the ground meal to the dispatching room in the vaulted cellar below. The mill was fitted with a hoist and ladders linked the stone and meal floors. The windcap, which supported the sails, was fixed by a geared rack to a curb at the top of the tower. The whole cap could be turned by hand into the wind by means of a pole. The sails, usually four in number, consisted of latticed wooden frames on which canvas was stretched. These too were set by hand to suit wind conditions. The mill was fitted with a brake so that the speed of the drive could be regulated. The danger in a gale was obvious, for if the brake failed, the windmill 'ran away' and the sails and windcap could be blown off or the whole mill destroyed by fire as a result of friction on the wooden machinery.⁴

With the growth of larger tower mills in the eighteenth century, both structure and associated machinery became far more complicated. Essentially this was a mere development of earlier tower mills, the whole being simply higher and the internal arrangements concentrated within one structure, as described above. The typical tower mill of this period incorporated the mechanical improvements of the age, such as the automatic winder or fantail, the spring sail, and the substitution of cast-iron for wooden machine parts. Undoubtedly the interest of contemporary engineers, such as Smeaton and Meikle, stimulated the erection of windmills, though

¹ For outline of windmill machinery see Bennet and Elton, *op. cit.*, 307-12; Wailes, R., *op. cit.*, and Freese, S., *Windmills and Millwrighting* (1957).

² *History of Technology*, III (1957), 95.

³ See McLaren's reconstruction of Dunbarney windmill.

⁴ This danger was in part removed by the introduction of cast-iron machine parts and better braking mechanism.

the reasons for building and location during this great period of construction were more often economic or geographical, as is discussed below.

The tower mill of this period consisted of three or four stories.¹ Three-floored types were commonest in Scotland. Depending on the location of the main driving wheel, the floors would be arranged from top downwards as hopper, stone and meal floor. The ground floor was the largest, whereas the upper floors were cramped – most space being occupied by the driving and grinding machinery. A four-storied mill had an additional floor – often located above the ground or meal floor – which housed the main drive gearing to the stone floor directly overhead. The main shaft or drive was often central, powering not only the stones, but also sieves, hoist and elevator. The windcap was boat-shaped, of timber construction, revolving on a cogged track fixed to the top of the stone tower. Four-sailed mills were common, although others with five or more are known to have existed.

Three mechanical innovations of the period are worthy of note. The first, the automatic winder, was invented in the 1740s and improved about 1750 by Andrew Meikle, inventor of the threshing mill. The purpose of the automatic winder was to turn the windcap and sails into the wind, without the need for a hand-driven pulley or beam winder, used until that time. Meikle accomplished this by means of a supplementary set of small sails, about 10 ft. in diameter, situated at the rear of the windcap and at right angles to the main sails (see fig. 3*b*).² The fantail was fixed to the windcap by a tail-beam, and usually consisted of eight small sails. A change of wind direction caught the fantail, which automatically turned the windcap and sails into the prevailing breeze. Meikle was also responsible for the second improvement to windmill machinery in his invention, in 1772, of the spring sail, a device which replaced canvas sails by slatted wooden shutters hinged and operated by means of tension rods and springs. The output of tower mills, like that of most grain windmills, depended very largely on the size of the sail-yard, and this was one of the reasons which prompted the erection of larger mills.³ John Smeaton, the great engineer, carried out many experiments in windmill technology, including research on the efficiency of mills and the application of horizontal techniques.⁴ His greatest contribution to the mechanics of contemporary windmills was his use, after 1759, of cast-iron to strengthen the various moving parts. Later in the century and in the early nineteenth century much of the gearing was made of cast-iron, but in general machinery remained mostly of wood.⁵

Only one of the surviving windmill structures in Scotland has any recognisable interior arrangements or machinery. It is the High Mill in Carluke and is described in the *Inventory*. From the layout there, and its similarity to other mills of eighteenth-century date, it can be considered as typical of its class and type.⁶ The only really fine example of a complete windmill typical of those once found in Scotland is at

¹ Development of tower mill outlined in Bennet and Elton, *op. cit.*, 293-320.

² Fairbairn, W., *op. cit.*, 289.

³ This trend was reflected in the whole historical development of windmills. See Bennet and Elton, *op. cit.*, 314.

⁴ Smeaton, J., *An Experimental Enquiry concerning the Natural Powers of Water and Wind to turn Mills and other Machines, depending on a Circular motion* (1794).

⁵ *History of Technology*, IV (1957), 148-67.

⁶ See *Inventory* (A), 10, Carluke.

Ballycopeland, County Down, and is in the care of the Ministry of Finance for Northern Ireland. It has been carefully restored in every detail, structural and mechanical, and illustrates well the layout and working arrangements of a typical Scottish mill (Pl. XXXVIII, 2).¹

Uses

The Scottish windmill's most obvious use was the grinding of grain of various kinds. Like the watermill, windmills were simply meal-mills, producing wheaten and oaten meals – as well as ground barley and bruised corn. Many of the larger windmills were built in the grain-growing countryside of the east coast and several no doubt produced wheaten flour. South Kessock and Bielside are good examples. Perhaps 80 per cent of all Scottish windmills were involved in grain-milling of some kind.

Records survive of windmills being used for grinding materials other than grain, including indigo, whin and lead-ore. The mills involved are described elsewhere in the text or in the *Inventories*. Associated with the grain mill was the threshing mill, and many windmills, particularly those adjacent to farms, were adapted to power a threshing mill in a nearby steading. Good examples are Mouswald and Hilton.

The second most important use to which windmills were put was the pumping of water, either in the process of drainage or for some other specific purpose.² Mills were erected for draining coal-mines, and quarries, and were used to pump water from lochs and marshes in the course of land reclamation projects. One windmill was erected to pump water from the sea into salt-pans.

Disused windmills were often converted to other uses. Many survived as dove-cotes, ice-houses and look-out towers. Many farm windmills are now used as barns or stores. Two mills have been converted for domestic use and another forms part of a public house.

Distribution

The geographical distribution of windmills in Scotland is related to a number of factors. At first glance the most important would appear to be that of rainfall. Almost 75 per cent of all recorded mills were situated in areas with less than 30 in. of rainfall per annum.³ This factor accounts for the wide distribution of windmills along the drier east coast, where less surface water was available to drive machinery. This was particularly true of East Lothian, Fife, Buchan and Moray, where windmills were concentrated in considerable numbers. Flat, low-lying land, where slow-moving rivers and burns prohibited the use of water-power without the erection of costly dams, ponds or weirs, provided another associated locational factor. Much of the east comes into this category, but other areas of note are Lochar Moss, the

¹ Description of Ballycopeland in Rhodes, P. S., op. cit., and Green, E. R. R., op. cit., 53, No 18 (Fig. 3 and Pl. 20 top).

² The role of windmills in drainage etc. is discussed in *History of Technology*, III (1957), section 12, *Drainage and Land Reclamation* (by L. E. Harris), 300–23.

³ An interesting comparison can be drawn between the distribution of English windmills in relation to rainfall and those in Scotland on a similar basis.

Merse, Easter Ross, Caithness and Orkney. Elsewhere in Scotland water was available in abundance and the watermill was in consequence more practicable and common. Yet windmills were found in exposed westerly districts, where the strong winds could be used to advantage at all seasons. Windmills were erected for this reason in the Rhinns of Galloway, the Machars, Ayrshire, the Clyde coast and Lanarkshire. In many cases local factors, such as short streams, flat countryside and

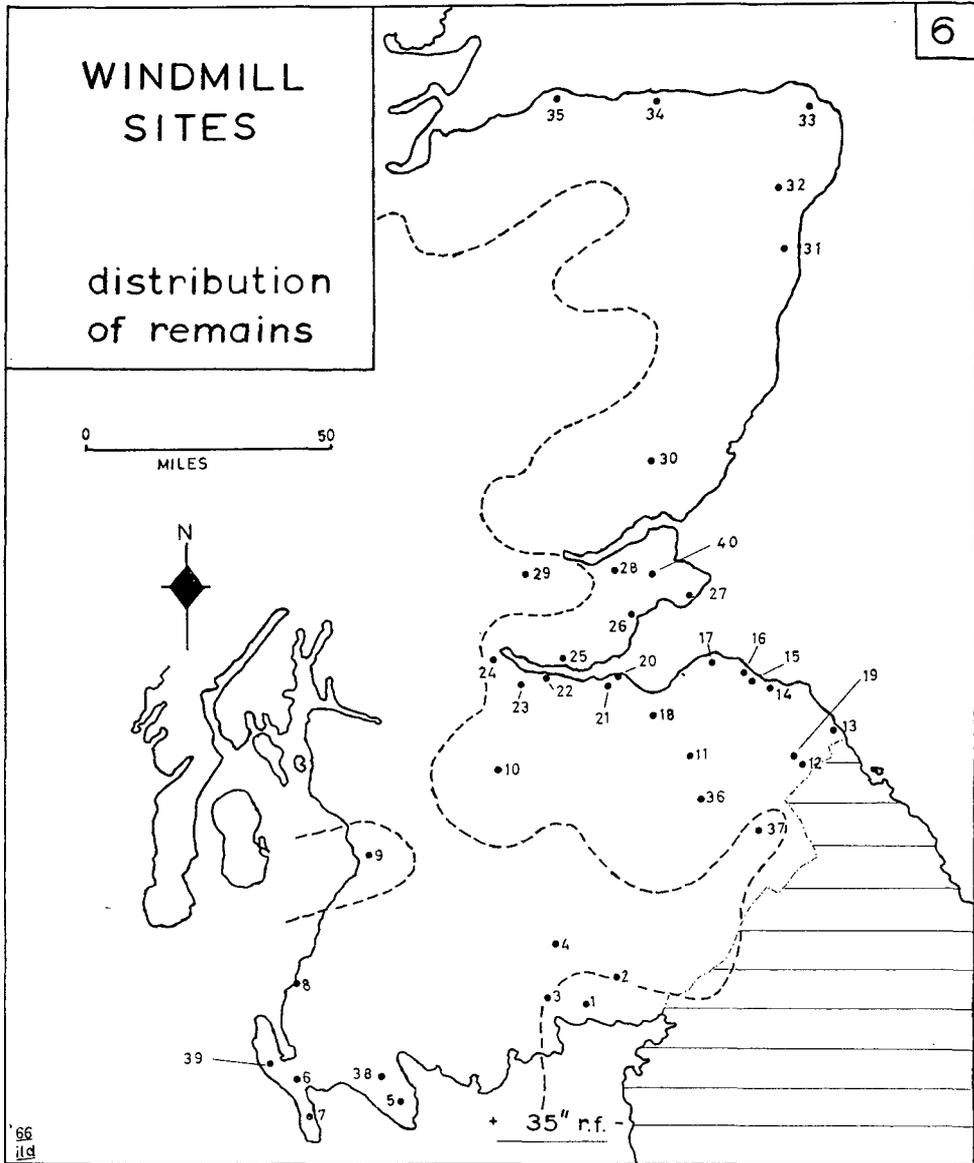


FIG. 6. Map showing distribution of windmill remains in Scotland, as described in Inventory (A)

exposure to winds, contributed to the siting of windmills in general. Before the eighteenth century, and in rural areas perhaps after, distance from field, farm and water were possibly of equal overall importance.

Moreover, such factors as convenience and cost cannot be overlooked. Although water was generally available throughout the year in most of Scotland, there was always the problem of drought. Water-wheels which had no catchment pond or reservoir could well stand idle for months, and this would be especially harmful at harvest time when drought was most likely to occur. Hence windmills were erected to supplement water-driven mills. Examples can be cited in Dumfries and Carluke, the latter having a High Mill (the windmill) and a Low Mill on Jock's Burn (water-powered). Many windmills were sited in grain-growing areas where the mill was an important feature of the rural economy. Reliability was thus essential. Windmill construction was probably always an expensive business, both in Scotland and elsewhere. It required skilled millwrights, and the machinery, although basically simple and of the most obvious materials, was more complicated than that of a watermill. Under the care of an experienced miller, a windmill would probably give good service, but it had many drawbacks. Damage from gales or fire could involve costly rebuilding. Indeed the relative costs of different types of mills is worth examining briefly, for it throws some light on windmill numbers and distribution. In 1797 it cost £200-£300 to erect a windmill, whereas a watermill could be built for £80-£100 and a horse-mill for £70.¹ Hence the popularity of horse-mills or gins in areas where water-power was not available. Even although these sums refer to the cost of erecting what was probably a large tower mill, it does demonstrate the fact that in terms of finance the windmill was never a sound proposition where water was available in plenty.

Specific locational factors of selected windmills illustrate some of the points mentioned above and introduce others. High exposed points in both west and east were obvious sites for windmills. Examples are to be found in mills at Logan Mill, Stoneykirk, Ballantrae, Monkton, Dunbarney, Edgehead, Michelston, Duncow, Shortrigg and Eyemouth. Many mills were built for specific purposes, such as grain-milling, threshing, and pumping water, uses which influenced both their location and construction. Several windmills were erected in towns and were the property of the respective burghs, as at Aberdeen, Montrose, Arbroath, Inverness and Glasgow, to name but a few.

In conclusion the windmill, during its short existence in Scotland, remained a feature of the east coast. This was partly a result of geographical factors, such as rainfall and relief combined with the fact that the area was the most important cereal-producing district in the country. Not only was the landscape there similar to that of eastern England and the Low Countries, but taking Scotland as a whole, it was the region most influenced by these countries, from economic, technical and cultural points of view. The early Scottish windmills, dating from the sixteenth and seventeenth centuries, almost certainly owe their origin in part to such influences, and later development was also related to techniques introduced from outside,

¹ Information from J. Reid, Alness.

particularly from England. During the eighteenth and early nineteenth centuries Scottish millwrights made their own contribution to windmill construction and these improvements were in use until windmills were superseded by steam-power. By and large, the windmill in Scotland, as in County Down, south-east Ireland, Anglesey, and areas of England outwith the eastern 'windmill belt', was an exotic growth introduced late. It remained markedly concentrated on the east coastlands, spreading to other areas only under exceptional local conditions.

PART II - WINDMILL INVENTORIES

(A) *Inventory of Windmill Remains*

This inventory lists all known sites, with name, Grid reference, and description, where windmill survivals exist. Although some of the entries are not as full as we should wish, every care has been taken to make the inventory as complete as possible. Many of the sites were visited in the course of field work, but some have been described from record sources and private communications. Fig. 6 shows the distribution of windmill remains, and the margin number to each windmill entry corresponds to its location number on the map.

1. MOUSWALD

NY 053736

The remains of a large windmill adjacent to Mouswald Grange farm. This conical shaped tower mill is about 45 ft. high, built of well finished sandstone rubble. It is a four-storied structure, with the former kiln attached (12 ft. square). The latter was equipped with cast-iron plates and was coal-fired from beneath. An interesting feature is the fact that a tar-pit worked in conjunction with this kiln. Most of the windmill machinery was removed 1910-20. A threshing mill (driven from the windmill) was last used around 1925 and the sails were apparently taken down shortly after. The structure is in excellent condition and was recently re-roofed. The mill dates from the late eighteenth century and appears on Thomson's 1828 map.¹

2. SHORTRIGG

NY 162744

Adjoining the main steading of Shortrigg farm, which is situated on upland overlooking the valley of the Annan, the remains of a large tower windmill. The structure, solidly built of well-finished sandstone is 40 ft. high, with ground diameter 20 ft. and top diameter 10 ft. The walls are 4 ft. thick at ground level tapering to 2 ft. at the top. There is one door at ground level (3 by 6 ft.) in the S. arc and two others in the E. and W. arcs, the former giving access to a barn and former threshing mill. The structure is roofed in slate and is surmounted by an ornate weather vane. Part of the present roof appears to incorporate the original windcap (the cogged track and part of the skirting). The first floor is intact, though only a few beams remain of the upper floors. All the mill machinery was removed 'about 100 years ago', and wind-power seems to have been dispensed with even before that. A horse-gin (diam. 20 ft.) built alongside the windmill provided power for the grain mill and the threshing mill nearby. Tower and horse-mill are now used as stores. Both are in fair condition, though stonework and roofing of the windmill could do with repair. The mill dates from the late eighteenth or early nineteenth centuries.

3. DUMFRIES

NX 968758

The remains of a much-altered tower mill on Corberry Hill. The structure is of sandstone, originally about 45 to 50 ft. high and internal diameter 25 ft. The mill was erected in 1798 but had

¹ *North and South Parts of Dumfries-shire*, John Thomson, 1828.

ceased operation only 30 years later. In 1834 it was taken over by the Dumfries and Maxwelltown Astronomical Society and converted to form an observatory. It later became a museum and a camera obscura was installed in 1836.¹ Recently the whole windmill section of what is now Dumfries Museum was modernised and this now shows the internal structure of the mill to advantage. The main drive shaft of the mill now supports the stairs. This has been a large mill, which bears striking similarities to *Carluke* in dating, site and structure.²

4. DUNCOW

NX 974838

About $\frac{1}{2}$ mile NE. of Duncow House the stump of a tower windmill, some 30 ft. high and ground diameter 20 ft. tapering to about 12 ft. The structure is massive, built of sandstone rubble. There are two doors, one of which has been blocked up. This mill is a good example of an early tower mill (it probably had three or four floors), dating from the late seventeenth or early eighteenth centuries. It appears on Thomson's 1828 map. At present it is in good condition, though open to the weather.

5. WHITHORN

NX 444398

At the top of High St., E. of the junction of the A750 and A746 roads, the stump of a tower mill 22 ft. high. The structure, of sandstone, rubble and brick is surmounted by an iron railing 3 ft. high running round the top. In the W. arc are the remains of a stone staircase, rising from ground to first floor. The tower was probably surmounted by a wooden superstructure which supported wind-cap and sails. The mill certainly dates from the late eighteenth century and was a meal-mill. A water-colour view of Whithorn in 1825 shows the windmill complete with sails. The structure is in a dilapidated condition and is known locally as the Stump.³

6. STONEYKIRK

NX 096524

Near Windmill Plantation, 300 yds. NE. of Low Culgroat farm, the remains of a small windmill, probably a turret post mill. The structural remains consist of a cylindrical stone and mortar tower 12 ft. high and 8 ft. in diameter. A single door (5 by 3 ft.) is the only opening. The lintel is gone. No machinery remains and little is known of the mill's history. It seems probable that this was a post mill and that the surviving structure provided the base for a wooden building similar to that at *North Ronaldsay*. Another possibility is that this was some sort of tower or smock mill of an amateur type. The mill dates from the eighteenth or nineteenth centuries (it is not marked on Johnson's 1826 map) and was possibly erected by an amateur millwright or enterprising farmer.⁴

7. LOGAN MILL

NX 115438

About $\frac{1}{4}$ mile N. of Logan Mill farm, the stump of a tower windmill. The structure, which is roughly built of rubble, is 20 ft. high and about 10 ft. in diameter on walls 2 ft. thick. It dates from the seventeenth century and is marked on Johnson's 1826 map. The mill is at present in good condition.

8. BALLANTRAE

NX 090833

On a hill 220 ft. above sea-level, about $\frac{1}{2}$ mile NE. of Ballantrae village the stump of a small tower mill. The structure, roughly built of rubble, is approximately 24 ft. high and 15 ft. in diameter on walls 3 ft. thick. The W. side of the building is linear on the arch. There are two openings (each 9 by 5 ft.) in the N. and S. arcs, which have been doors. The remains are in fair condition, though there is no machinery or fittings. This mill, which probably dates from the late seventeenth or early eighteenth centuries, is marked on Armstrong's map of 1773-5, by which time it had possibly fallen out of use.⁵

¹ Third Statistical Account, *County of Dumfries* (1062), 128.

² Dumfries windmill is marked on Thomson's 1828 map.

³ Whithorn windmill is marked on Johnson's 1826 map of the *County of Wigton*. We are grateful to Miss E. McCaig and Rev. J. W. T. Dickie for information. Ref. in *P.S.A.S.*, LXXX (1945-6), 144.

⁴ Information from I. J. MacMaster.

⁵ This mill was ruinous in the 1790s. There is an interesting reference in Heron, R., *Observations made in a Journey thro' the Western Counties of Scotland*, II (1799), 311: 'On the top of a low hill, near Ballantrae, I observed the ruins of an old windmill. There was a time when windmills were more common in Scotland, than

9. MONKTON

NS 361281

The stump of a tower mill about 30 ft. high and 12 ft. in diameter, standing on an artificial mound. The latter houses an arched underground cellar which projects about 15 ft. from the basement of the tower under the main floor. This mill, like those at *Dunbarney* and *Gordonstoun*, is a classic example of the vaulted tower mill (class 2). The mill apparently dates from the early eighteenth century for like the one at *Ballantrae* it appears on Armstrong's 1773 map. It was converted to a doocot in the early nineteenth century and is at present roofed and in fine condition. It is surmounted by an ornate weathervane.

10. CARLUKE

NS 849508

At the top of Chapel St. (former Windmill Brae) on the highest point of Carluke, the remains of a substantial windmill, known as High Mill. The structure, roughly built of sandstone, is 35 ft. high with ground diameter of 25 ft. Adjoining the tower on the W. arc are a store (20 by 15 ft.) and a large kiln (15 ft. square). An engine house (12 ft. square) and stack (about 30 ft. high) are built on the S. side. The mill dates from 1797, when the feu of the land on which the structure stands was assigned to David Dick. It appears on Forrest's 1816 map and is mentioned in an 1817 placard, issued by the local laird to encourage feuing: 'A Wind Mill has been erected for making Meal & Barley for the Inhabitants, in the Smallest quantities, and of easy access'.¹ Starting life as a windmill, it was converted to steam-power about mid-nineteenth century and was later driven by suction gas. It continued to operate under the Dick family until as late as 1930. The remains are considerable and well preserved, by Scottish standards. The wooden superstructure is long removed, though the original flooring, stairways and much of the machinery are still intact. The latter is much altered as a result of several power changes, though the original main drive is still in position. The layout of machinery on the hopper, stone and meal floors is much confused, but seems typical of most windmills of the period. In fact, it much resembles Ballycopeland. The High Mill is probably unique in that it preserves the original layout in spite of considerable internal alterations throughout a long working life. Originally a meal-mill, it was later equipped with a threshing mill, the additional buildings being added when the change-over to steam took place. Much of the remaining machinery is wooden, some being fitted with cast-iron cogs and gearing. The original millstones were of French burr, 4½ ft. in diameter. This mill is probably the most interesting windmill in Scotland, and the case for preservation is strong.

11. MITCHELSTON

NT 462481

Adjoining Mitchelston farm, some 2 miles N. of Stow, the remains of a large tower mill. The structure, which is well built of rubble, stands about 45 ft. high with ground diameter 12 ft. and top 10 ft. The roof is missing and no machinery remains. The mill, which dates from the late eighteenth or early nineteenth century, was used for grain-milling and threshing. It is in good repair, but is due for demolition within the next five years.

12. SWINTON

NT 835475

On the N. side of Swinton village, opposite the Green and approached by a cart-track, the much diminished remains of a large tower mill. The surviving structure, roughly built of red sandstone, is 15 ft. high and 25 ft. in diameter on walls 2 ft. thick. There was a door at ground level in the W. arc (3 by 7 ft.) but this is now blocked up. On the S. side 12 ft. up there is a window 3 ft. square. An adjoining building (15 ft. square) was possibly a dispatching room or kiln. The mill, which dates from the late eighteenth century, was probably a three-storied structure about 45 to 50 ft. high. When surmounted by its cap and sails it must have been a prominent landmark for miles around.

mills driven by water. The ruins of such mills are still to be seen on various heights. They stand lonely and desolate as if overthrown in the combat with some Don Quixote and dismantled by the victor.¹

¹ Rankin, D. R., *Notices Historical, Statistical and Biographical relating to the Parish of Carluke* (1874), 233. We are grateful to J. Phillips for information on the history of Carluke windmill.

13. EYEMOUTH

NT 947637

At Gunsgreenhill the much reduced and altered remains of a small tower mill. The circular stump about 25 ft. high, is of random rubble, with bricked up windows and pantiled roof. Erected in the nineteenth century, this mill was until about 40 years ago used for pumping water. It is now incorporated into the farmstead.

14. OXWELLMAINS

NT 703763

In a hollow 200 yds. SW. of Oxwellmains farm, the remains of a small windmill. Constructed of rubble and freestone the tower is 15 ft. high. The internal ground diameter is 6 ft. 3 in. and top diameter 2 ft. 6 in. on walls 1 ft. 9 in. thick. There is one small door in the W. arc 2 ft. 3 in. by 4 ft. At a height of 2 ft. from the ground a series of holes (each 6 in. in diam.) encircle the tower at 3 ft. intervals. The opening is surmounted by a sandstone lintel, and coping stones of the same material surround the top of the tower. This mill, which dates from the late eighteenth century, appears to have been used for pumping water.¹

15. KNOCKENHAIR

NT 669789

At Belhaven on a prominent site and now incorporated in the garden of a private house, the remains of a small tower mill. Described in 1832 as Knocking Hair Tower² this structure had obviously long been out of use as a windmill. It was ruinous in 1855 but was reconstructed as a study and given a conical slate roof in 1907. It now stands 17 ft. high to the wall-head and is 13 ft. in diameter on walls 2½ ft. thick. At 7 ft. 4 in. up on the exterior the wall is in-taken about 6 in., there being signs of further in-taking some 6 in. higher. The masonry is of random rubble, but heavy harling obscures details. Both windows and doors are modern. This mill probably dates from the seventeenth century and almost certainly had a vaulted lower chamber, similar to other mills of this date and type.³

16. BIELSIDE

NT 655783

Near the mouth of the Biel Water at West Barns, the remains of a substantial tower mill, with the upper part removed, and adapted for domestic use. The structure is of rubble, mainly red sandstone, and is finished with rough harl. About 30 ft. high, the tower has an external ground diameter of 20 ft. and top diameter of 12 ft. The mill tapers gently and the original interior of three floors is preserved. The ground floor houses a chamber, shaped like a truncated cone, which was formerly entered by the main door – now built up as a window. The mill has been extensively altered on conversion to a dwelling. Fenestration is domestic and there is an interesting pigeon-port at the top of the tower. A sketch in the possession of the owner shows the mill before alteration – but without sails. A four-sided pantiled roof has been replaced by the present asphalt one. The mill probably dates from the late eighteenth century, and was a grain mill.

17. BALGONE BARNES

NT 553828

About ¾ mile SSW. of Berwick Law, the stump of a tower mill. The structure of rubble and freestone stands about 35 ft. high and is 15 ft. in diameter, on walls 3 ft. thick. An underground vault extends 20 ft. out from the base of the tower. It is 14 ft. wide and is constructed of masonry 2 ft. thick. There were two doors (6 by 3 ft.), one of which is now blocked up. The major part of the tower is still sound although about one-third has collapsed from the top in the S. arc. It dates from the late seventeenth century and was a barley mill. Probably it fell into disuse in the eighteenth century and was heightened by about 10 ft. to become a dovecote. It had certainly ceased to function as a windmill by 1799, when it was recorded on Forrester's map as 'pigeon cot'.

¹ This mill must be the smallest surviving in Scotland. At first glance we were apprehensive about its having been a windmill. However, it seems likely that any machinery was situated outwith the tower itself. Mr J. Reid, millwright, thinks that it was a windpump.

² Boundary Commission Report map 1832.

³ We are grateful to A. Graham for information on this windmill.

18. EDGEHEAD

NT 372651

The remains of a fine tower mill, converted to form a dwelling house known as The Old Windmill. The structure, built of well-finished sandstone blocks, stands 35 ft. high. It is of bee-hive shape, outside ground diameter being 27 ft. and top 16 ft. on walls 4 ft. and 2 ft. thick respectively. Fenestration is domestic, there being three windows on each of the three floors in S., E. and N. arcs. The main door was in the W. arc. The tower is surmounted by a conical slate roof. Prior to conversion, timber buildings and a large brick stack – suggesting that the mill was once steam-powered – adjoined the tower. Little is known of the mill's history, except that it has been out of use for many years. Local intelligence claims that it was a 'Whin mill' for the grinding and provision of cattle feed. It seems likely from its position that it was in fact a grain mill. It was converted to a dwelling in 1960.

19. SWINTONMILL

NT 814459

The stump of a tower mill, rubble built, and about 25 ft. high, now incorporated in a large farm steading. This windmill dates from 1813 and is marked on the 1st O.S. survey map.

20. LEITH, TOWER

NT 271786

The remains of a much-altered tower mill at the corner of Tower Street and The Shore. The structure, of rubble and sandstone, is circular in plan and about 50 ft. high. It was originally erected as a windmill sometime after 1686, when Robert Mylne of Balfargie – who owned land and property on Leith Shore – undertook to erect 'a wynd mill of largeness of thretty-two feet diameter over the walls'. At the end of the eighteenth century – by which time it had clearly ceased to function as a windmill – the structure was provided with windows and a crenellated top and functioned for some time as a signal tower. It is known by this name and at present forms part of the Tower Tavern, while the top floors are used for dwellings.¹

21. BELFORD ROAD

NT 237737

On the high left bank of the Water of Leith at the NW. corner of John Watson's School property, the ruined stump of a tower mill. Originally 30 ft. high, the structure is now 24 ft. high at one side and 17 ft. at the other. Roughly built of rubble (walls 4 ft. thick), it is 13 ft. in diameter. A rectangular building – now demolished – opening from the W. arc probably housed a store and kiln. This tower appears on a 1759 map of Edinburgh as 'An Old Windmill'. The remains date from the eighteenth century.²

22. BRIDGENESS

NT 013815

Overlooking the Firth of Forth at Bridgeness, the site of a tower mill dating from 1750.³ Bridgeness Tower, a nineteenth-century outlook tower about 50 ft. high and 20 ft. in diameter, probably incorporates the remains of the mill. The structure certainly resembles the *Tower* at Leith. It is now abandoned and in poor condition.

23. MYREHEAD

NS 965775

Stump of a large tower mill, 40 ft. high and internal ground diameter 19 ft., contracting above the second floor on walls 3 ft. thick. The structure, roughly built of rubble, has large freestone quoins at the doors. There were originally three floors, as the arrangement of doors, windows and joist holes clearly illustrates. On ground level are two doors, one of which is original. On the first floor is another door, in the S. arc, which is obscured on the exterior by an adjacent farm steading. A fourth door (in W. arc), from which the lintel has been removed, is situated at second-floor level. About 8 ft. above the lintel of the ground-floor entrance a ring of holes runs round the exterior; these probably supported a balcony surrounding the tower. The structure is in good condition, though unroofed. It dates from late eighteenth century.⁴

¹ R.C.A.M.S. *City of Edinburgh* (1951), 255-6.

² *ibid.*, 241.

⁴ R.C.A.M.S. *Stirlingshire* (1963), 383 and Pl. 205.

³ *P.S.A.S.*, LVIII (1923-4), 286.

24. DUNMORE

NS 861895

On the edge of Dunmore Moss, some 3 miles NW. of Airth, the remains of a small tower mill. The structure, well built of sandstone blocks, is about 25 to 30 ft. high with a ground diameter 12 ft. and top 9 ft. on walls 2 ft. thick. There is a door roughly 7 by 3 ft. The top of the mill is missing and the tower is open to the weather. The mill was erected in the eighteenth century and appears from its size and position to have been a windpump for drainage of the Moss.

25. HILLHOUSE

NT 091859

About 50 yds. E. of Hill House, the stump of a small tower windmill, 15 ft. high and 16 ft. in diameter on walls 2 ft. thick. The structure, roughly built of rubble, brick and cement, is harled and limed. It rests on a vaulted cellar built on an artificial mound. The latter is well preserved, being of sandstone and measuring 18 by 10½ ft. The interior of this vault, which stretched into the basement of the mill, is blocked up by a stone wall. The mill itself is completely closed, the only door being blocked up in brick. The entrance to the vault has a seventeenth-century chamfer and the mill is clearly of this date.¹

26. DYSART

NT 299935

Immediately N. of the cemetery the stump of a small tower mill. It is roughly built of rubble and is 18 ft. high and of external diam. 14 ft. on walls 2 ft. thick. It rested on a vaulted cellar, which projected about 10 ft. from the base of the mill in the E. arc. This vault was 13½ ft. wide built of arched masonry 1½ ft. thick. It is now infilled and the only door has recently been blocked up in brick. The mill dates from the late seventeenth or early eighteenth century. It was converted to form a lookout tower in the early nineteenth century and housed a searchlight during the second World War, but its original use is preserved in the name of a road nearby.²

27. ST MONANCE

NO 533018

On the raised beach at East Braes, the stump of a windmill, known locally as Windmill Tower. The structure, roughly 30 ft. high and 15 ft. in diameter on walls 3 ft. thick, is built of rubble and sandstone. It has two doors (3 ft. 3 in. by 7 ft.) in each of the E. and W. arcs. The wooden superstructure is long removed and the mill is open to the weather. In the base of the tower at ground level is an opening (3 ft. square) which probably allowed axles and gearing to be led from the mill down to the rocks below where the salt-pans were situated. The mill dates from the late eighteenth century and according to the Statistical Account was erected to pump water into the nearby salt-pans (St Monance, like *Dysart*, was once famous for salt) belonging to Sir John Anstruther.³

28. COLLESSIE

NO 298142

At the back entrance to Melville House, opposite Windmill Cottages, the remains of a small tower mill. The structure is of rubble and stands about 25 ft. high with an internal diameter of 12 ft. on walls 3 ft. thick. It tapers to a slated roof with crowstepped gables. The tower stands on an artificial mound, which houses a vaulted cellar opening into the base of the mill. The structure probably dates from the late eighteenth century and has been converted to a doocot following its abandonment as a windmill.

29. DUNBARNEY

NO 110187

On an elevated site above the valley of the River Earn, the stump of a fine tower mill, 19 ft. high, tapering from ground diameter 20 ft. to 17 ft. at the top. The structure (walls 3 ft. thick) is of rubble. Internally at a height of 4 ft. above ground level the wall increases in thickness to form a projection over the bottom floor of the mill. An arched underground cellar, about 12 ft. wide, extended out-

¹ Hillhouse windmill has clearly undergone considerable structural alteration since its abandonment as a mill. We concluded from its size that it either had a larger superstructure than usual, or that a portion of the stone tower has been removed. The structure has probably served as a doocot at some time, and the vault as an ice-house.

² *P.S.A.S.*, LXXIX (1944-5), 12 and Pl. I (3). Since altered.

³ *Stat. Acc.* has reference to salt-pans and windmill.

wards 24 ft. from the base of the mill. There are two doors at ground level, one on the E. arc, the other on the W. An interesting reconstruction of this mill appears in McLaren's paper. It dates from the late seventeenth or early eighteenth century and is at present in good condition.¹

30. BANKHEAD

NO 483467

About 3 miles SE. of Forfar at Bankhead the remains of a circular windmill tower incorporated in a now disused threshing mill. The windmill has been much altered and the whole building, of rubble and slate, is at present in poor condition. Dating for the windmill probably early nineteenth century.

31. WESTER HATTON

NJ 956162

On the edge of Broom Hill, 500 yds. NW. of Wester Hatton farm, the remains of an early wind-pump. The structure of the pump is of wrought iron, standing on a stone base and is about 40 ft. high. This pump has been out of action for over 100 years. Apparently at one time it was also adapted for powering a threshing mill at Easter Hatton by the addition of pulleys and wire rope drive. It cannot really be considered as a windmill, but is noted here as a more interesting example of the iron windpump.²

32. HILTON

NJ 942342

The remains of a substantial mill adjoining the steading at Hilton of Turnerhall. It is 50 ft. high - the bottom 30 ft. being an eight-sided structure, each panel 6 ft. at ground level, tapering to 5 ft. 3 in. At the top of this section there is a slate-slab walk 22 in. wide, supported by a 6 in. thick granite spur at each corner of the eight sides. The top part of the tower is circular, 20 ft. high with an 8 in. granite table round the top. It is 38 ft. in circumference at the slate-slab walk and it tapers 1½ in. in 3 ft. up to the granite table. In the bottom section there are one door and three windows, and in the upper another door and two windows. All the walls are 2 ft. thick. The interior wood-work is rotted, though some is still intact. The staircase is spiral type, fixed to the inside of the wall. There were four floors, supported by wooden beams (12 by 9 in.), which also held the shaft bushes. The drive shaft was 3 in. in diameter, but this is now removed. The date of erection is thought to be 1787, though the later date of 1825 is also possible. The tower was a well-known landmark in the mid-nineteenth century. The sails were blown off the night of the Tay Bridge disaster in December 1879. Thereafter the mill was driven by horse-power and later by a steam engine. The latter was removed in 1924 and the mill driven by tractor till 1956, when it was last used. The present condition of the tower is excellent and it now houses a diesel burner for a grain drier.³

33. STRATHBEG

NK 056586

About ¼ mile E. of Loch of Strathbeg on the marsh at the edge of the Burn of Savocho, the remains of a small tower mill. The structure, roughly built of rubble, is 18 ft. high with ground diameter 8 ft. 9 in. and top diameter 7 ft. 6 in on walls 2 ft. 9 in thick. Nothing remains of the superstructure or machinery, apart from the main drive shaft and pinion gears at the top of the tower. The mill, which dates from the late eighteenth century, was used as a windpump to drain summer grazing meadows near the Loch. Old Statistical Account reports in the 1790s that 'an attempt has lately been made to drain the Loch of Strathbeg; but the person who made the attempt failed in his circumstances, which has suspended the work'.⁴ Likewise the New Statistical Account, 1840, records that 'an attempt was made by a Mr Sellar 44 years ago to drain this Loch'.⁵ Undoubtedly the windpump was erected at this time. It was in use until about 100 years ago.

34. SANDEND

NJ 560657

Some 200 yds. SE. of the old distillery at Sandend Bay, the remains of a windmill, known locally as the 'Cup and Saucer'. The surviving structure consists of a stone tower roughly 10 ft. high on a

¹ P.S.A.S., LXXIX (1944-5), 6-7 described this mill in detail. Since slightly altered.

² Information from A. J. Thow, J. Reid and G. Thomson.

³ Information from G. Mitchell.

⁴ Stat. Acc., xvi, 632 outlines in detail.

⁵ New Stat. Acc., xii, 219.

base 20 ft. in diameter. Massive iron rings are fixed into the stonework of the base at regular intervals. It would appear that this structure formed the base of a turret post mill somewhat similar to those at *Stoneykirk* and *North Ronaldsay*. The iron rings probably formed anchors for the beam or ropes which kept the mill into the wind. The mill dates from the late eighteenth or early nineteenth century.¹

35. GORDONSTOUN

NJ 188694

Several hundred yards NE. of Gordonstoun House the stump of a tower windmill. It stands on an artificial mound some 10 ft. high. The structure, which is circular and roughly built of rubble, stands 35 ft. high and is 16 ft. in diameter on walls 3 ft. thick. Vaults extend outwards from the base of the tower in the N. and S. arcs. Only that on N. side is now intact, the other having fallen in. The vaults, which were formed of arched masonry, are 19 ft. long and 10 ft. wide, extending about 10 ft. outwards on each side of the mill. The original doors at ground level have been blocked up. The cellar was also fitted with doors, internal and external, which were 5 ft. high and 3½ ft. in width.² The structure, which dates from the mid-eighteenth century, probably replaced an earlier windmill on the same site. It probably ceased to function as a windmill about the end of the eighteenth century, and was converted to a doocot. The Laird of Gordonstoun had four doocots about this time, and there is no reason to doubt that this was not one of them. The Windmill Dovecote, as it is known, was at one time in danger of collapse, but recently the entrance to the basement was infilled to provide a buttress effect and the cracks in the structure cemented up.³ Like similar windmills which were converted to doocots, Gordonstoun was heightened and fitted out with three stiring courses and two ports for the pigeons. Until recently the doocot had a working potence.

36. RUMBLETONLAW

NT 676453

Adjacent to Rumbletonlaw farm, the stump of a small tower mill which probably dates from the early nineteenth century.

37. CAVERTON MILL

NT 750258

On the Kale Water, 2 miles NE. of Morebattle at Caverton Mill farm the small stump of a tower mill, rubble built. Dating probably late eighteenth century.

38. BARWHANNY

NX 410495

About ½ mile SE. of Whauphill, adjacent to Barwhanny farm, the remains of a small tower mill. The structure, which is built of sandstone rubble, stands about 25 ft. high and is 10 ft. in diameter. It probably dates from the late eighteenth or early nineteenth century, although it does not appear on contemporary maps as a windmill.

39. LESWALT

NW 994625

On a wooded hill overlooking Lochnaw Castle, the remains of a structure known as Kinsale Tower. This small circular rubble tower stands about 30 ft. high and is very overgrown. This may latterly have served as a lookout tower, but was possibly a windmill at an earlier date. No information as to dating, probably eighteenth century.

40. NORTH CALLANGE

NO 122420

Adjacent to North Callange farm, the remains of a small tower windmill, of rubble and sandstone construction. Dating probably late eighteenth or early nineteenth century.

¹ Information from J. McNaught and J. Reid.

² Douglas, R., *The Dovecotes of Moray* (1931), 27; *Gordonstoun Record*, Serial No. 38, (1957), 86-87.

³ We are most grateful to the Warden of Gordonstoun, H. L. Brereton, for information on this site.

41. SORN

NS 548264

Near the River Ayr opposite Sorn village an octagonal sandstone tower formerly a windmill. The structure is 30 ft. high and 10 ft. in diameter with a door in the ground floor and windows in the two upper floors. The tower is in fair condition and is now incorporated in the farm steading.

42. NORTHFIELD, GAMRIE

NJ 823661

A square tower 15 ft. high surmounted by a round structure 15 ft. high rising to a conical roof. The upper half is tapered and windows and bricked up doors occur at various floor levels. There are remains of wooden driving shafts and supports. The windmill probably dates from the late eighteenth or early nineteenth century and much resembles that at *Hilton* (32). Recorded in *Discovery and Excavation Scotland 1966*.

43. SCAR, WESTOVE, BURNES

HY 670452

Near Scar farm the remains of a two-storey circular windmill in random rubble. The structure is roofless and has a door opening at the second storey with stepped threshold. This site, recorded in the *Lists of Buildings of Architectural and Historic Interest* prepared by the Scottish Development Department, seems to be the only substantial survival in Orkney.

44. MOUNTBLETTON

NJ 721611

Adjacent to the farm steading the remains of a windmill similar in dimensions and structure to those at *Northfield* and *Hilton*. Dating probably early nineteenth century.

(B) Inventory of Windmill Sites

The following inventory makes no attempt to list all the sites of windmills in Scotland. Many have, in fact, escaped accurate record, particularly the early ones. This inventory presents a selection of interesting sites and has been compiled from record, map, print and other sources. Grid references are given where possible.

ANNAN

NY 194672

About $\frac{1}{4}$ mile E. of the River Annan, the site of a windmill marked on John Thomson's 1828 map. The mill was apparently in use till its demolition in the mid-nineteenth century to make way for housing.

RIGG

NY 288668

In Rigg village just N. of A75 road, the site of a windmill. Marked on Thomson's 1828 map as 'Old Windmill', the structure was possibly removed to make way for road or rail development in the nineteenth century.

HAMILTON

NS 718557

The site of a windmill marked on Wm. Forrest's 1816 map. It was a tower mill, probably a large grain mill, erected in the late eighteenth century, about the same time as its surviving neighbour at *Carluke*. It was possibly demolished to make way for railway development and its site is preserved in a nearby street name.¹

MOTHERWELL

NS 7556

Near Dalziel old parish church there once stood a windmill erected to pump water either from a well or quarry. No information as to dating – probably eighteenth century – although its location is also preserved in a local street name.

¹ Miller, A. G., *Hamiltonia*, 132, has reference. We are grateful to Mr and Mrs W. Wallace for information.

GLASGOW: WINDMILLCROFT

NS 589647

The site of a tower mill, about 100 yds. W. of Jamaica Bridge on the S. bank of the Clyde, now occupied by the bed of the river. According to 'Senex', 'it was a solid and substantial piece of masonry raised a little above the level of the river-bank by being placed on a sandhill. It was without roof and consisted merely of bare walls. Entry was toward the South by a large semi-circular archway.'¹ From this description it would appear to have been a mill of Class 2 dating from around the seventeenth century. 'Senex' says that it was removed about 1800 to make way for harbour improvements. The mill is marked on John McArthur's plan of the City of Glasgow, 1788.

SHETTLESTON

NS 6463

Another mill whose existence is recorded by 'Senex'. It was erected to pump water from a mine belonging to John Gray, a local coalmaster, in 1737. 'It continued to draw water successfully until the windy Saturday of 13th January 1740, when it was blown to pieces and was never again re-fitted.'²

GREENOCK

NS 2776

Greenock appears to have had several windmills at different times in its history. The last was sited 'in the neighbourhood of George Square, probably on or near the site of the Watt Monument in Union Street'.³ This area was known as Windmill Croft. A 1768 print of Greenock shows the mill on the high ground to the S. of the Old West Church.

EDINBURGH: GEORGE SQUARE

NT 2572

The site of a seventeenth-century windmill, erected to pump water from the Burgh Loch to supply the Brewers of the Society, a company established under James VI in 1598. The water was conveyed from the mill in lead pipes to a reservoir near Teviot Row. The pipe was 4½ in. in diameter and was unearched in 1786 when building was under way in the locality.⁴

LEITH

NT 2676

Like Greenock, Dundee, Arbroath and Montrose, Leith had several windmills at different times. An interesting one is recorded in the late seventeenth century.⁵ It was erected to grind and refine lead-ore from Leadhills in Lanarkshire by the Earl of Hopetoun, and was the subject of a court case in 1704. Leith has a surviving windmill in the *Tower* at the Shore, described above.

PAPPLE

NT 591725

The site of a windmill marked on Fowler's 1824 map of Haddingtonshire.

EAST BARNs

NT 717763

The site of a windmill marked on Fowler's 1824 map. This structure was apparently demolished in the mid-nineteenth century to make way for a steam-powered threshing mill.

PENSTON

NT 445725

The site of a windmill demolished to make way for airfield installations during the second World War. This is probably the same structure said by Green⁶ to resemble the mill at *Balgone Barns* and known as 'Windmill Dovecot'. It probably dated from the seventeenth century. A fine exposed site.

WEST PEASTON

NT 428653

The site of a windmill marked on Fowler's 1824 map.

ATHELSTANEFORD MAINS

NT 541771

The site of a mill marked on Fowler's 1824 map. No information.

¹ Senex, *Glasgow Past and Present*, I (1884), 397.

² *ibid.*, II, 60.

³ Williamson, G., *Old Greenock* (1886), 45.

⁴ Grant, J., *Old and New Edinburgh*, II, 346.

⁵ *ibid.*, III, 190.

⁶ Green, C. E., *East Lothian* (1907), 129.

PHANTASSIE

NT 597773

The site of a windmill marked on Fowler's 1824 map. This mill stood behind the existing steading and appears from a print to have been a tower mill about 35 ft. high with a wooden windcap and four sails. Andrew Meikle, the millwright, who was one of the pioneers of the automatic winder, worked here for some time.

OXWELLMAINS

NT 703763

A second windmill is recorded here on Fowler's map. It does not survive, but was probably larger than the existing structure, built as a meal or threshing mill.

COLLIN

NY 0275

East of Dumfries at Collin village, there stood a windmill in the late seventeenth century. Probably a post mill, it figures in local records from 1670 to 1700.

INVERKEITHING

NT 1382

The site of a windmill, dating from the mid-eighteenth century. No information.¹

PRATHOUSE MOOR

NT 1487

About $1\frac{1}{2}$ miles N. of Inverkeithing, the site of a windmill, alluded to in the Burgh Records for 1819. No further information.

TORRYBURN

NT 028856

About $\frac{1}{2}$ mile SE. of Torryburn, N. of the old church on Forth shore, the site of an Old Windmill, marked on the 1st O.S. survey. No information.

DUNKELD

NO 021425

Some 300 yds. W. of the cathedral, the site of a windmill illustrated in Slezer's *Theatrum Scotiae* of 1693. It appears to have been a tower mill with four sails of the type common at this time.²

AIRTH

NS'8987

The site of a sawmill driven by wind-power. Dating early eighteenth century.

MONTROSE

NO 7157

Montrose had at least three windmills. One is shown on a view of the town in *Theatrum Scotiae*, published in 1693. There was a windmill at Rossie (possibly a meal or pumping mill) and this was apparently replaced in the early eighteenth century, when the Burgh magistrates sent a wright to Holland to learn the latest methods of windmill building.³ Windmills were probably built in and around the Montrose basin to act as drainage pumps.

ARBROATH

NO 6341

Near Millgate, on what was known as Windmill Hill, the site of a seventeenth or eighteenth-century windmill. This is marked on the Boundary Commission Report map of 1832.

FORFAR

NO 4551

The site of a tower windmill, erected in 1644, the property of the Burgh. It was demolished in 1838 to make way for railway and warehouse development.

¹ Stephen, Rev. W., *The Story of Inverkeithing and Rosyth* (1938), 97.

² *P.S.A.S.*, LXXIX (1944-5), 10 and Pl. II.

³ *The Scots Magazine*, New Ser., Vol. 84, No. 6 (March 1966), 582.

BROUGHTY FERRY

NO 4630

Near Broughty Castle the site of a tower mill of eighteenth-century date. The structure is illustrated in *The Parish of Monifeth*, 1910.¹ It seems to have been standing in 1853 and was demolished in the late nineteenth century. It was a circular tower mill about 30 ft. high and 12 to 15 ft. in diameter, of rubble construction. It had a wooden windcap and five sails, an interesting feature.

DUNDEE

Dundee, like other east coast ports, had a number of windmills. At least three are recorded. One was a malt-grinding mill and stood near South Union Street. Another was situated to the W. of the town. It was a meal mill.

ABERDEEN

NJ 9306

The site of an early or mid-seventeenth-century tower mill, near Windmill Brae, on what was then known as Windmill Hill.² It appears on a plan of the city by James Gordon dated 1661. The mill had four sails and probably stood on an artificial mound.

PETERHEAD

NK 1346

The site of a tower mill near the present Windmill Street. It was eighteenth century in origin and is mentioned in the Statistical Account of 1794. 'There is a windmill near the town of Peterhead on a small eminence, for grinding malt, and which lately by a small addition to the machinery strikes pot (pearl) barley.'³ A photograph of the circular structure is preserved in the Arbuthnot Museum.⁴

MAINS OF CAIRNBULG

NK 024642

About $\frac{1}{4}$ mile NE. of farm the site of a windmill marked on 1st O.S. survey and later editions. Possibly a metal windpump.

QUARRYHILL

NK 053626

Similar to the above, situated 200 yds. E. of B9033, St Combs road.

MOUNTBLETTON

NJ 721611

The site of a farm windmill dating from the late eighteenth or early nineteenth century.⁵

LOCH SPYNIE

NJ 2366

The site of a windmill erected c. 1720 by Archibald Dunbar of Thunderton to act as a water pump. A system of canals and dykes was devised to drain the Loch of Spynie which had been formed behind wind-blown sand at the mouth of the River Lossie and several other local burns. The windmill and its pumping machinery were apparently successful in keeping the waters at bay, but some years after a storm destroyed the mill and its accompanying machinery. The Loch was not finally drained until 1808-12 when Thomas Telford's Spynie Canal was constructed to lead the waters to the sea.

SOUTH KESSOCK, INVERNESS

NH 658470

About $1\frac{1}{2}$ miles from the centre of Inverness, near Kessock ferry, the site of a large tower mill demolished in 1943. This was a fine structure solidly built of sandstone about 50 ft. high, diameter 20 ft. at the base and 15 ft. at the top on walls about 2 ft. thick. A surviving photograph shows that it had four floors when surmounted by its windcap. Most of the machinery was removed many years prior to demolition, though the mill is known to have had four sails. It was erected in 1827 by Wm. Wright and was in use till the 1880s. Sometime during the late nineteenth century it was

¹ *ibid.*, illustration reproduced, 580.

² Bulloch, J., *Aberdeen 300 Years Ago* (1884), mentions windmill and reproduces Gordon's plan.

³ *Stat. Acc.*, xvi, 547.

⁴ Information from G. H. Brebner.

⁵ Information from J. Reid.

equipped with a steam engine, at first used in a calm, but later superseding wind-power altogether. The mill was used for grinding grain, including wheat. It is marked on various nineteenth-century maps including the Boundary Commission Reports and the 1st O.S. survey.¹

FORT GEORGE

NH 7656

The site of a small tower mill, used for pumping water for the garrison. Built of stone, it was demolished about 50 years ago. Marked on 1st O.S. survey.²

TARREL AND ARBOLL, EASTER ROSS

NH 8883

Two farms which probably had wind-powered threshing or meal-mills in the nineteenth century. Many years ago traces of these buildings could be seen adjacent to the farm steadings.²

ACHSCRABSTER, CAITHNESS

ND 083636

About $\frac{1}{4}$ mile NW. of Achscrabster quarries, on a small pond, the site of an Old Windmill. This structure, which was a wind-pump, is marked on the 1st O.S. survey.

HOPEFIELD

ND 075676

Near the disused Hopefield quarries a similar windmill to that above.

LANGLAND

ND 078675

Another windpump 200 yds. N. of an old quarry. Marked on 1st O.S. survey and later editions.

PECKHOLE, N. RONALDSAY

HY 763529

The site of a fine turret post mill, of which the conical stone foundation survives. This turret was rubble built about 10 to 12 ft. high. The mill was of timber about 15 ft. in height and 8 ft. square on the walls, with a sloping roof. It was turned into the wind by means of a large tail-pole about 35 to 40 ft. long. It was powered by four sails of canvas, each about 15 ft. long. There was one small door at the rear and also a hoist on the outside of the mill. Nearby are the derelict remains of a larger water-driven mill. An interesting print by T. S. Pearce shows this mill, which remained working into the early years of this century. It was nineteenth century in origin.³

DYKESIDE, ORKNEY

A small farm windmill of the type common in Orkney in the late nineteenth century. It had six cloth sails, which ran *back* to the wind, and there was no tail. The mill was set by hand and fixed by rope guys. The number of sails put on could be varied according to wind strength, and the whole thing could be stopped by turning the sails into the wind. Power to the machinery in the barn beneath was transmitted by bevel pinions at the top of the tower, giving a reduction of 1:4, by a shaft to another pair of bevel pinions, and through the wall by another shaft. See fig. 4 and Table I.

VINBRECK, ORKNEY

A similar windmill to that at Dykeside was sited at Vinbreck farm. Like most of the Orkney 'amateur' type of windmills this was easily transportable, and could be taken down and re-erected quickly. This particular mill was photographed in 1909, and this print survives.

CHINEGAR, ORPHIR, ORKNEY

The site of another 'amateur' mill erected in 1910 by Robert Harvey. It consisted of a wooden superstructure and four sails, with power transmission to the mill itself. It worked till 1939.

In addition to the above, windmills are known to have existed in *Paisley, Saltcoats, Crail, Anstruther Easter, Elie* (mentioned above), *Largo, and Cousland*. Several early tower mills probably survive in

¹ We are grateful to Wm. McDonald and J. Cook for information on the history of this mill.

² Mr J. Reid remembers seeing these mills 'well before the first World War'. There are unlikely to be any remains.

³ See fig. 1c and Table I.

Fife and *Moray* as dovecotes (*Crail* is a possible example). There can be no doubt that many more, both in the east and elsewhere have escaped record completely.

CONCLUSION

The most obvious conclusion which can be drawn from this brief survey is that the windmill was a commoner feature in Scotland than has previously been realised. There are records and survivals, no matter how inadequate, of at least 90 to 100 windmills – no mean total for a country so well endowed with water-power resources.



1. *Mouswald Grange*, a fine large eighteenth-century farm windmill (No. 1)



2. *Shortrigg* windmill, showing adjoining horse-mill (left) (No. 2)



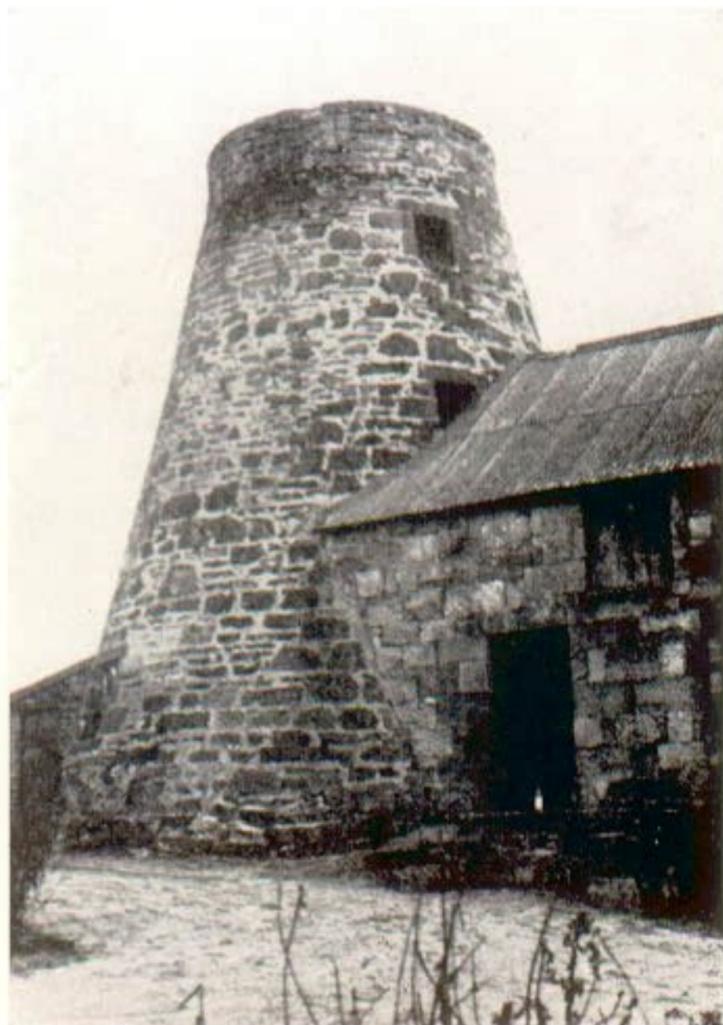
3. *Dumfries*, a much altered tower windmill, now part of the Museum (No. 3)



4. *Duncow*, a good example of an early tower mill. Notice the massive structure (No. 4)



1. *Monkton*, a vaulted tower mill with well-preserved lower chamber (No. 9)



2. *Carlisle*, dating from 1797, a fine tower mill, containing some original machinery (No. 10)



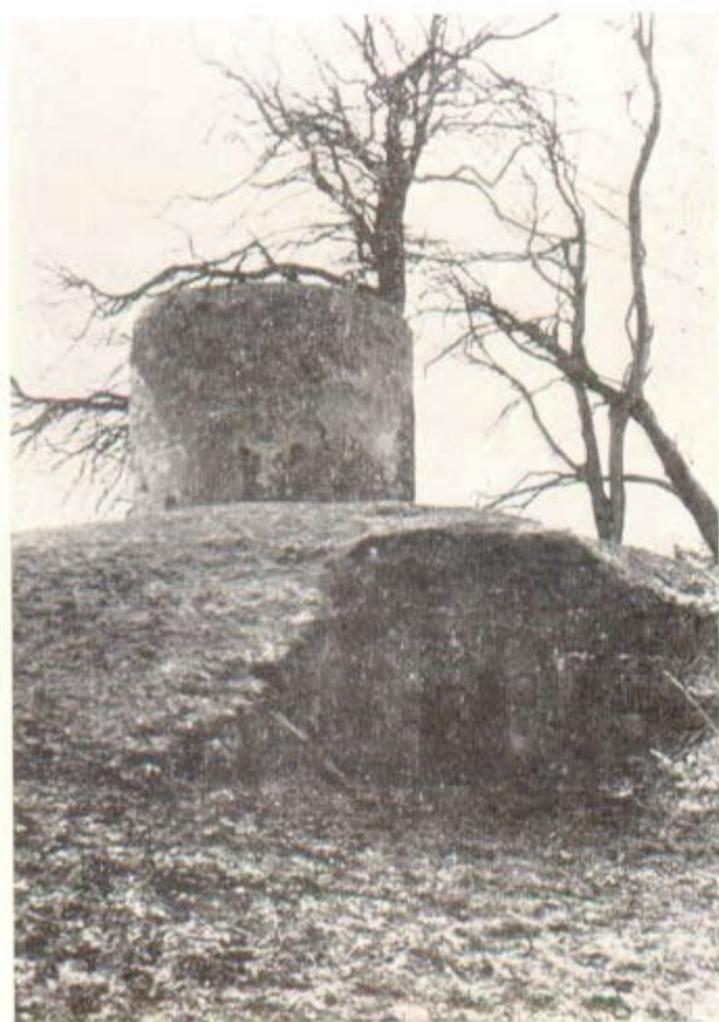
3. *Oxwellmains*, probably a small eighteenth-century windpump (No. 14)



4. *Balgone Barns*, a seventeenth-century windmill heightened for use as a doocot (No. 17)



1. *Knockenhair*, a small tower mill, probably of seventeenth-century date (No. 15)



2. *Hillhouse*, an early vaulted mill, since used as a doocot and ice-house (No. 25)



3. *St Monance*, a well-preserved windmill which once pumped seawater into nearby salt-pans (No. 27)



4. *Bielside*, a fine windmill converted for domestic use (No. 16)