

IV.

THE HORIZONTAL WATER-MILL AT DOUNBY, ON THE MAINLAND OF ORKNEY. BY STEWART H. CRUDEN, A.R.I.B.A., F.S.A.Scot.

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It is not my intention in this paper to deal with the history of primitive horizontal water-mills in general, for that subject has been treated exhaustively by other authorities mentioned in the appendix, and I have no contribution to historical research to submit from a study of this particular example, but rather to put on record its hitherto unpublished features, for it is under the charge of the Ministry of Works as an ancient monument, and being in good working order—itsself an uncommon feature—thereby merits notice.

This interesting water-mill at Dounby (Pl. XII, 1) is the last of its kind in Orkney, but one of the best surviving examples of a type more numerous represented in the Shetlands and the Faroes, and by no means uncommon in the Western Isles and Ireland. It appears from its extensive distribution throughout Europe and Asia to have an early origin and a late survival. That it has an early origin is not surprising when one considers its simple mechanism, not from the point of view of mere simplicity being an indication of antiquity, but from a consideration of its component parts and the method of operating them. We see that this type of mill is in fact a mechanised hand-quern, operating not by manual or animal labour, but by machinery propelled by a controlled rush of water of moderate force derived from the small streams in these islands.

As the water supply is scant, the stream is dammed at a convenient place some distance above the mill so as to form a reservoir or mill-pond from which the water, controlled by a simple sluice, is diverted along a mill-lade to the mill-house and directed therein down a trough to the fins of the mill-wheel which lies in a horizontal position; hence the type-name of horizontal water-mill (Pl. XI, 1). These fins are frequently housed in the wheel obliquely, the more effectively to revolve and turn the vertical spindle which passes upwards through the lower mill-stone and is fixed to the upper, causing it to rotate upon the lower. The pressure of one stone upon the other is regulated by means of wedges, thus permitting flour of different degrees of fineness to be milled.

The corn is held over the mill-stones in an open pyramidal box called

the hopper, and is fed into the circular aperture of the upper stone through a tray which can be raised or lowered to control the flow of grain, the impulse that projects the grain from this tray being a joggling motion usually created by a small piece of stone resting upon the upper mill-stone and attached to the tray by a string. The rotation of the mill-stone, which has a rough surface, irregularly tugs the string and shakes the tray, from which the grain falls into the eye, fast or slow, according to the way the tray is set.

The design and performance of the many hundred mills of this character recorded by travellers is identical, save for the minor differences of detail to be expected in primitive economies where the basic idea is the governing one. For example, the Dounby mill has a variant of the joggling operation (Pl. XI, 2). Instead of a loose piece of stone connected to the tray by string, we have here a piece fixed to the upper stone and revolving with it, which strikes against a wooden tongue projecting from an armature attached to the tray, thereby causing the tray to eject grain once per revolution. Also, we have here the hopper supported over the stones upon a timber framework, whereas it is usually suspended from the rafters by ropes. Other noteworthy features are the sunk flour-box, the string-and-peg contrivance for raising and lowering the angle of the tray, and the double tier of fins upon the mill-wheel (fig. 1).

The mill-house is of two compartments: an upper, containing at one end the entrance door (Pl. XII, 2) and a wind-door opposite for the escape of chaff, and at the other end the grinding apparatus described; and a lower chamber, containing the horizontal mill-wheel upon which the water debouches from the chute, and from which it escapes into the mill-overflow (fig. 2), whence it is conducted back to the natural stream again and reused further along its course by another mill.

Many mills were worked from the same stream, as one sees from the photograph featuring the mills at Sandness, Shetland (Pl. XII, 3), not on a commercial basis—they are too small for that—but on a family basis, and they were open to all.

A popular name for such mills is Clack Mill, derived from the distinctive clacking noise they make when in operation—the noise of the clapper against the tray or armature—and this name provokes interesting conjectures concerning place-names such as Clockmill Road and House, Edinburgh, and Clickimin, Peebles, and the exhortation addressed to the “scleuder wyves” in the “Clerke’s Tale” of Chaucer, in the following terms “Ay clappeth as a mill I you consaille.” Stoddart, in his *Remarks on Local Scenery and Manners in Scotland*, 1799 and 1800, describing the Water of Leith, which he states served eighty mills, refers (vol. i. p. 101) to “the occasional clack of an adjoining mill”; while Miss Francesca French, joint author of *The Gobi Desert*, makes a more distant reference by recording ninety-nine on the banks of one small stream in the Shansi Valley in North China.



1. Fins of mill-wheel.



2. Hopper and mill-stone.



1. Horizontal Mill at Dounby.



2. Entrance.



3. Mills at Sandness, Shetland.

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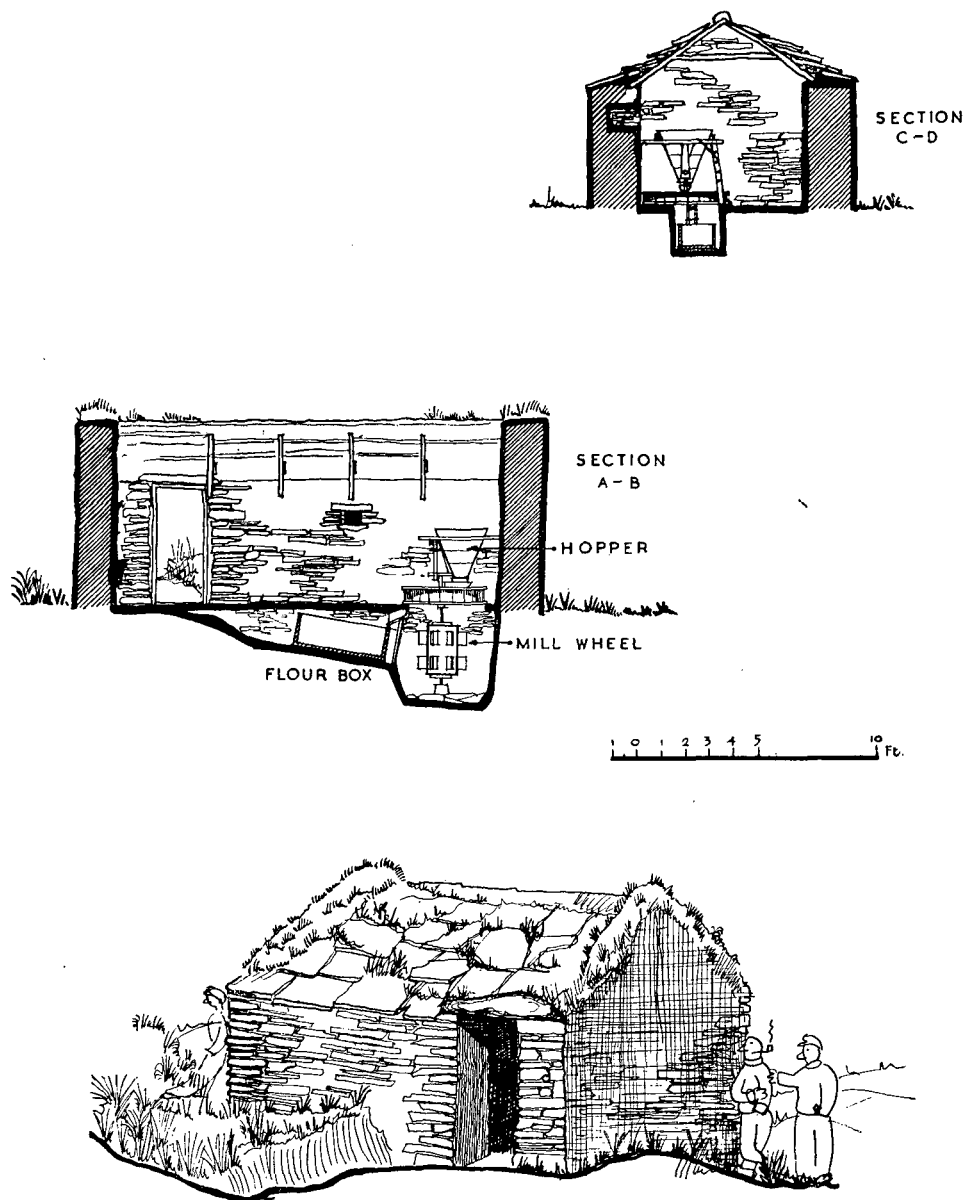


Fig. 1. Horizontal mill at Dounby, Orkney: Sections.

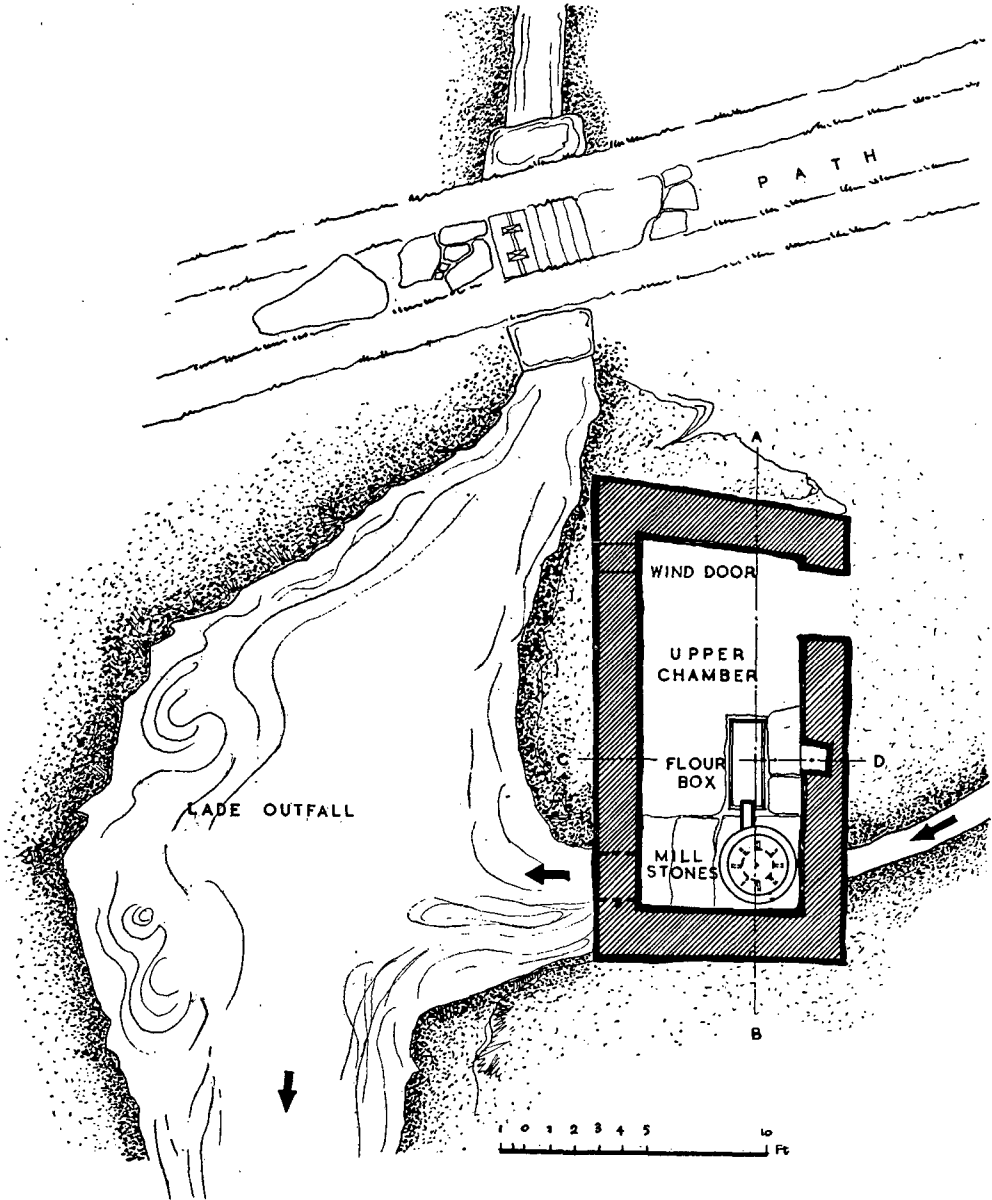


Fig. 2. Plan of Dounby mill.

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The Orkney Archæological Society repaired the mill before it was offered, in 1932, by Mr James Flett of Dounby to the then Office of Works. Mr John Mooney, a Fellow of the Society of Antiquaries of Scotland, was largely responsible for encouraging this transference of ownership of the mill, and in other ways took an active interest in its care and maintenance. On assuming guardianship the Office of Works carried out certain repairs to the building and machinery, and engineered a water-supply from the stream.

In the Belfast Municipal Museum there is a scale model of this mill for comparison with a similar Irish example.

I am indebted to Dr Aage Roussell for the loan of the photograph of the mills at Sandness, Shetland, and to the Royal Commission on Ancient Monuments for the photograph of the mill-wheel, the other photographs being from the records of the Ministry of Works. The drawings I have made are also derived from the Ministry's records.

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