

Draining and Flooding LAND DRAINAGE

Scotland is a land of high rainfall and soils with poor natural drainage. If crops were to be grown without risk of flooding or water-logging, something had to be done.

One of the oldest methods was to plough the soil into ridges (*rigs*) so that water could drain away into the hollows either side of each ridge, leaving the crops relatively dry. These rigs can be seen in many places, such as here at **Maddison, Falkirk, Stirlingshire**. The earlier ones are wide, high and curved; the later ones – some as recent as the mid-19th century – are lower, narrower and straighter. The best places to see them are on marginal land, between the still-cultivated Lowlands and the permanent pastures of the Uplands.



In the 18th century, attempts were made to install drains underground, by digging trenches, putting stones into them and topping them up again with soil. This was a slow and expensive way of tackling the problem and drains tended to clog up again. Clay tiles, buried in the fields, were being used by the early 19th century. Some of these were horse-shoe shaped, with a separate, flat base; others were cylindrical. In either case, their production, by hand, was slow and expensive, so their use was limited.

Things began to change in the 1830s and '40s. First, machines were invented which could make tiles much faster and at lower cost. Tile-works sprang up all over the Scottish Lowlands. One of the last to work was at **Ochiltree, Ayrshire**, where tiles were made from local clays, fired in a kiln heated by locally mined coal.



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Secondly, the Government offered generous loans against expenses incurred in land-drainage, and exemption from tax on tiles (some of these were stamped 'DRAIN' to distinguish them from other tiles). From here on, sub-soil drainage proceeded at a pace, though the task of digging trenches for the tiles still involved arduous manual labour. This picture shows a **man digging a drainage ditch at Portmoak Moss, Kinross-shire.**



Today, using tractor-drawn implements and rolls of plastic piping, sub-soil drainage is a far easier task.



For large areas of moss and lands subject to flooding, more radical methods were required. As far back as medieval times, marshy areas had been drained by the cutting of long, open channels, termed in Scotland '*pows*'. The *Pow* of Inchaffray, Perthshire, dates from the 13th century. In later times, the flat flood plains of many burns were freed from flooding by similar measures.

The vulnerability of the flood plain and the straightened course of the burn are both apparent in this photograph of **Kilmartin, Argyll**.



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In Ross-shire, the Peffray Burn was straightened and deepened (below, left), providing not only better-drained surroundings but also a channel for shipping to reach the town of **Dingwall, Ross and Cromarty**.



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Machines for water lifting have been used in Scotland since at least the 16th century, notably in coal mining but also in land drainage and water raising for agriculture. Wind power was the means most commonly used, as at **Dunmore, Stirlingshire** (above, right), where a **windmill tower** still survives. Hundreds of small water-pumps, mounted on metal towers and powered by the wind, were installed on farms in the late 19th and early 20th centuries. These were marked on Ordnance Survey maps, and a few are still in place.

To find out more:

Fenton, A. *Scottish Country Life*, Edinburgh, 1976

Millman, R.N. *The Making of the Scottish Landscape*, London, 1975

Looking at drainage

When you are in the countryside, you can look for ways in which people have affected the drainage of the land.

- ***Straight watercourses*** were made by human action
- ***Embankments*** along the side of a river stop it flooding the land
- ***Flat, marshy areas*** might once have been lochs

Place names also give clues. For example, a *pow* was a deliberately made drainage channel. Elements of place names often seem half-hidden when they are combined together, for example *Powburn Toll*.

Land drainage – THEN and NOW

1. Before the mid 18th century, significant areas of lowland Scotland were still marsh, useless for pasture or crops. **How did the farmers try to solve this?**

- (a) Farmers set about importing new crops from places of similar climate, which would grow and thrive on Scotland's water-logged soils.
- (b) Farmers increased the amount of available land by draining the marshes; ploughing the soil into ridges (rigs) so that water could drain, leaving the crops relatively dry.

Think about your answer. What evidence of this can you see **now** on Scotland's landscapes? Are there any examples near where you live? Next time you are in the car or train, see if you can spot any.

2. Which of the following statements best describes a 'Pow'?

- (a) A *Pow* is a long, open channel, cut into a marshy area as a means of draining the soil.
- (b) A *Pow* is a narrow, enclosed channel, built underneath the soil in a marshy area as a means of draining it.

Answers

1. The correct answer is (b) Farmers increased the amount of land which was available by draining the marshes; ploughing the soil into ridges (rigs) so that water could drain, leaving the crops relatively dry.

Although this process was the oldest method of draining soil, it can still be seen, (although more improved) on today's fields.

2. (a) A *Pow* is a long, open channel, cut into a marshy area as a means of draining the soil.