

The Afforestation of Culbin

THE Culbin Sands on the shores of the Moray Firth, between Forres and Nairn, is a place of unusual interest. This range of dunes and moving sand hills is one of the few places in the British Isles where there are square miles of country which resemble the great deserts of other regions. Moreover, its present desolation and barrenness are in sharpest contrast to its fertility and prosperity in earlier times, and challenge man to do something to revive that prosperity. Something of the tragedy that overtook the barony of Culbin is known to most Scotsmen.

Culbin was a settled area from the earliest times, as is shown by archaeological discoveries which have been made from time to time. These include flint implements, bronze ornaments, and coins dating from Roman times onwards. For some time prior to 1400 the estate belonged to the family of de Moravia, when it passed into the possession of a Kinaird of Kinaird by his marriage to the de Moravia heiress, Egidia. In the seventeenth century the barony of Culbin was a fertile and prosperous estate consisting of a mansion house, sixteen farms and several crofts, extending in all to some 3600 acres. The River Findhorn meandered through the estate and entered the sea near The Bar; it no doubt increased the productiveness of the land and contributed to the wealth of the community through its salmon fisheries. Its present course to the east was one of the consequences of the catastrophe about to be described.

CATASTROPHE

It was in the autumn of 1694 that this flourishing community was overwhelmed with a great sea of sand driven by a merciless gale from the west. Tradition tells that this great sand storm came with startling suddenness, because the ploughman had to leave his plough in the furrow, and the reapers their gathering of the last of the harvest. After much of the land was smothered in sand, there was a lull in the storm, but its fury was renewed again, and mansion house, farms, and orchards were finally lost to view under mountains of sand. The mouth of the River Findhorn was choked and its course changed.

The laird, Alexander Kinaird, his young wife, and infant son had to flee from their home, and his patrimony became almost worthless.

One naturally asks whence came all this sand and why did it suddenly advance over, these fertile lands? The conditions on this part of the Moray Firth are unusually favourable for the accumulation of great masses of sand. The River Findhorn brings down great quantities of it, and has done so for many centuries. The currents off the coast are towards the west and lend to carry the sand in this direction; it accumulates in dunes and hills on the beaches along the coast.

It is probable that there were previously greater sandhills at Maviston to the west of Culbin than there are now. These hills, no doubt, were at least partly fixed with "bent," or Marram grass, called *Psamma arenaria*, broom, and other plants commonly found under such conditions. This "bent" has a stout root-stock which ramifies through the sand and helps to bind it together. Its leaves are stiff and glaucous, and it makes a good thatching material for the roofs of houses. For centuries it has

been used for this purpose on the Moray Firth coast, and only eight years ago certain persons petitioned the Burghead Town Council asking that they should be given permission to pull "bent" for this purpose. In the year following the catastrophe at Culbin the Scottish Parliament passed an Act making it an offence to pull "bent" and other sand-binding vegetation, hence it would appear that the belief at the time was that the destruction of "bent" on the sandhills had contributed to the destruction of the barony of Culbin. It is probable, however, that the sandhills to the west had been advancing for some time and that the storm of 1694 was the final catastrophe.

The scene after this great sand storm must have been similar to what can be seen to-day on the unreclaimed parts of Culbin. Photograph 1 (see preceding pages) shows a bare waste of sand and also a "winter" loch. There are numerous small lochs throughout the area; a few have water all the year round, and some have been successfully drained and planted, but most are "winter" lochs—dry in summer and filled with slightly brackish water in winter and after heavy rain.

The sandhills are every shape and size; some reach an altitude of 100 feet, but most of them are smaller; some are long ridges, some conical, others dome shaped, and a few of crescentic form. The sand is in movement even on still days. The prevailing wind is from the west, and this results in the dunes having a gentle slope on the west side where the sand blows up, and a steeper slope on the eastern side. Photograph 2 shows one of these steep easterly slopes, and in the background there are natural clumps of the "bent," *Psamma arenaria*. Many of the unreclaimed sandhills are devoid of any vegetation, but throughout the area there are many tussocks of "bent" which have been utilised for the fixation of the sand to be described later.

RECLAMATION

No efforts at reclamation appear to have been made for over a century after the tragedy of 1694, but in 1839 Mr Grant of Kincorth started planting on the landward side of the area where there were few menacing sandhills. This was successful, and other proprietors followed. In the course of time what is known as the Low Wood covered a considerable part of the flatter and more fixed sand. This wood was felled at the end of the War. Before the War, the late Mr Chadwick of Binsness formed some interesting plantations on the east of Culbin using Corsican pine. There still remained, however, several thousands of acres of moving sand the reclamation of which had not been attempted.

If Low Wood had not been replanted after the post-War fellings it is probable that the reclamation which had been carried out by private owners would have been undone by further sand blows. The Forestry Commission, however, began to acquire land at Culbin in 1921, and now own over 5000 acres, partly felled woodland—the Low Wood—partly partially-fixed sand dunes, and partly the larger moving sandhills illustrated in Photograph 1. Planting began in 1922, and up to date 3200 acres, or about 5 square miles, have been planted. The first plantations were formed mainly on the felled woodland areas at the west of the area where the sand was largely fixed and carried a typical heath vegetation, largely heather, *Calluna vulgaris*. The principal species planted on this type of ground was the native Scots pine. These areas now carry flourishing plantations, the trees on the oldest, now thirteen years old, being over sixteen feet high.

On the more difficult fixed sites, for example, drained loch sites, a Western American species, Lodgepole pine, has been used. It got this name because the Red Indians used it because of its

straightness for holding up their wigwams. Photograph 3 shows a plantation of this species planted in 1922 and now over twenty feet high. The sand in this instance was covered with heather, seen in the foreground.

A MORE FORMIDABLE TASK

The afforestation of the sand dunes and hills with moving sand presented a much more formidable task. Some of these dunes carry tufts of "bent" and are partly fixed, but many have little vegetation, and all require treatment before they can be planted with trees. It is no use planting trees where the sand is in active movement, because they are either smothered with sand, or the sand blows away and the roots are exposed, as is shown in Photograph 4.

The first step is to fix the sand. Normally this is done by planting the "bent" or Marram grass. Tufts consisting of leaves and part of the rootstock already described are pulled up, and these sets are dibbled into the sand at a spacing of 12 inches or less. The rootstock grows and binds the sand, while the leaves shelter it. Photograph 5 shows an area of sand planted with "bent" in this way. There are frequently holes where the wind has scooped out the sand, and these are difficult to fix with ' bent. Branches of birch or broom are used to thatch such places, and this quickly fixes the sand— Photograph 6. Birch and broom occur naturally on the sands, the former on old loch sites now dry and amongst the pines.

When the sand is thus fixed, small trees 2 to 3 years old and once or twice transplanted in, the nursery, are planted on the sand at 4 to 5 feet apart, . Experience has shown that the best species for the less fixed dunes is Corsican pine. This tree is a native of the mountains of Corsica and other places round the Mediterranean Sea and on its islands. It is deep rooting and well adapted for these deep dry sands. Even after fixing and planting, the wind sometimes blows out pockets of sand, and further fixation is necessary, but if the sand is held, flourishing plantations result. Photograph 7 shows a plantation of Corsican pine planted in 1928 on dunes fixed with " bent," seen in the foreground.

The work began on the more fixed areas and proceeded eastwards, where the largest and most difficult sandhills are located. Several hundred acres of these still remain to be dealt with. The task of their afforestation is formidable, but with the experience gained, and by proceeding slowly, holding the sand already fixed, there is a reasonable prospect that in the course of time they will be conquered and that most of the Culbin Sands will carry a flourishing pine forest. Continual vigilance is necessary, however, because the sand is easily disturbed even by walking over it. When the sand breaks loose, it quickly advances and may envelope even flourishing plantations, as can be seen in Photograph 8, which shows a plantation of Corsican pine on the Binsness estate adjoining the Commission's estate. For that reason the Forestry Commissioners have at this stage to limit the access of the public to the Culbin Sands.

The Forestry Commission are charged not only with afforestation but also with the creation of small holdings for forestry workers. Seven such holdings have been established on the better land to the south of the sands. Something is being done, therefore, to revive the former prosperity of the barony of Culbin.