MEMORABLE

FLOODS IN THE HIGHLANDS

DURING THE

NINETEENTH CENTURY

WITH

Some Accounts of the Great Frost of 1895

BY

D. NAIRNE

Inverness
THE NORTHERN COUNTIES PRINTING AND PUBLISHING COMPANY, LIMITED

—

1895

taining communication between dwellings and outhouses, and attending to the wants of stock at the farm steadings. Everyone making such expeditions found himself walking between solid walls of snow, in many instances quite as high as the head." From these particulars it can easily be imagined how severe a flood must have been produced by a sudden and rapid thaw with the plains and mountain sides so laden.

CHAPTER II.

FALL OF BONAR BRIDGE.

THE tidal water in the Kyle of Sutherland is a continuation of the Dornoch Firth, and penetrates inland from Bonar-Bridge to Inveroykel, a distance of about thirteen miles. So far as it goes, it forms the boundary line between Ross and Sutherland. Along the greater part of its course it more resembles a sluggish stream than an arm of the sea on which tides rise and fall. In some places, however, it widens into a miniature loch, such as Culrain, for example, where it developes into a rectangular sheet of water about half-a-mile wide by three-quarters long. The scenery along both banks is exceedingly charming, and deserves to be better known. Although the neighbouring mountains lack the rugged grandeur of the West Coast ranges, there is, all around, a pleasing combination of hill and dale, wood and water, interspersed with cottages, farms, shooting lodges, and mansions, along with minor accessories, which help to complete the ideal landscape. With the exception of the majestic Tay, there is, perhaps, no other estuary on the East Coast of Scotland that discharges such a volume of water into the ocean as the Kyle does at Bonar-Bridge, where the united rivers Carron, Shin, Cassley, Oykle, Einig, and many minor streams empty themselves into the Dornoch Firth. The Shin alone, including the rivers Tirry, Merkland, Fiodhaig, Grudie, and other tributaries, drains about 260 square miles of hilly country ; the Oykel and Einig, with their branches, about 215 square miles the Carron, with such affluents as the Calvie, Blackwater, Alladale, &c., close on 160 square miles ; and the Cassley about 100 square

miles. The mountainous nature of the country, and also the fact that most of the rivers have their sources within a few miles of the western seaboard, where the climate is moist, account for the frequent overflowings of the Kyle, causing more or less damage every year. In the autumn of 1890, for example, the inundations caused enormous losses to farmers and crofters. A great number of sheep were drowned, and a considerable portion of the oat crop—almost ready for the stack-yard—was washed away to sea. Great damage was done to roads, fences, and bridges. The loss on Invercharron Farm alone (which included the produce of 40 acres of oats), was estimated at £500. Other memorable floods took place in times past, of which only oral accounts have been transmitted. One of these, which occurred 40 or 50 years ago, is still remembered from the fact that the Invercharron tenants were obliged to remove their pigs to the attics of their houses to save them from drowning.

A Scene of Awful Sublimity

So far as concerns the present generation, even to that ubiquitous and veracious authority, "the oldest inhabitant," the spate of 29th January, 1892, was by far the most disastrous in its results. On the 6th January a snowstorm commenced and lasted for about ten days. At its worst the uniform depth ranged from 18 inches at sea level to 3 feet or more in the higher inland districts. The prospect of a sudden thaw under such circumstances was viewed with alarm by such of the inhabitants as were exposed to danger from a flood. Fortunately, however, the subsequent frosts and thaws which alternated for about ten days greatly diminished the mass of snow. On Thursday, the 28th, thaw proper set in ; rain commenced and continued to fall in torrents throughout the night. Owing to the heavy downpour, combined with the rapidly melting snow in the thousand corries which ramify the basin of the Kyle, the country was, on the morning of the 29th, inundated to an unparalleled extent so far as authentic records go. Strathkyle and Strathoykel were converted into one vast lake from the lower end of the one to the upper end of the other. The farms which dot the fertile plain between Culrain and the head of the Dornoch Firth were all submerged, in fact it appeared as if the Firth had penetrated inland several miles beyond its usual bounds. The Shin rose to

such a height as to submerge—for the first time since its erection—the iron swing-bridge which spans it below the fall. The Cassley overflowed its banks, leaving destruction in its train, and some houses in the glen appeared to be in such danger of being undermined that the inmates fled for their lives. The large stone bridge at Invercassley on the Lairg-Lochinver route was somewhat damaged, and fears were at first entertained that it would collapse. The swollen rivers Oykel and Einig, as they thundered and foamed through their tortuous rock-bound channels, presented a scene of awful sublimity which will not be readily forgotten by those who witnessed it. The river Carron, however, did far more damage along its course than all the other feeders of the Kyle put together. In Glencalvie the impetuosity of the flooded stream was so irresistible as to carry away first a wooden bridge, then a new iron bridge, which was on the eve of being completed. Farther on the latter incident is fully noted. A foot bridge was swept off at Alladale and another at Deanich. The wooden bridge at Amatnatua and the iron one at Gruinards were both submerged, and the former slightly damaged. The iron swing bridge at Invercharron, which was several feet under water, was struck by a passing tree, and shortly afterwards by *debris* from other bridges which completed its destruction. The whole of Strathcarron was inundated, and one dwelling-house was for a time in danger of being carried away, its inmates being at the same time unable to escape, nór could aid reach them from without owing to the depth and velocity of the current around them. Enormous quantities of manure, potatoes, turnips, and other farm produce were swept away, and numbers of sheep were drowned. Miles of roads and fences were completely wrecked. The Strathcarron public road was in some places flooded to the depth of four or five feet, and the amount estimated to repair the damage was £355. Many acres of soil were washed clean away, and in numerous other cases whole fields received a deep top-dressing of stones, shingle, gravel, and other rubbish. At Invercharron Mains the steadings and stackyard (which at the time contained about 40 stacks of grain) were three feet under water, as were also the estate manager's house, the gardens and greenhouse. At South Bonar communication between the house—formerly the Ardross Hotel—and the steadings was carried on

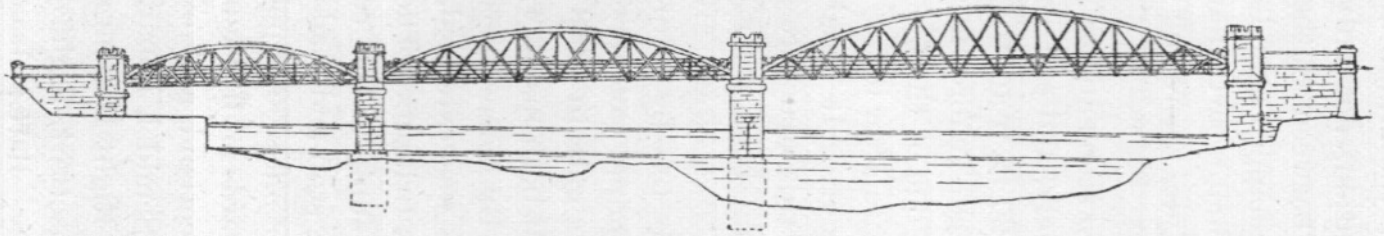
by boating; but eventually matters looked so serious that Mr Anderson and his family evacuated the house. Almost all the boats belonging to the various salmon fishing lessees were wrenched from their moorings and carried off to sea. A great quantity of fishing material shared the same fate. All the fishermen's houses along the Kyleside were submerged 3 to 6 feet according to situation. A substantial wooden house on the Ross-shire side was under water to about half way between the eaves and the bridge The heaving waters gradually hoisted it intact from its foundation, after which it floated off to sea until dashed ashore a complete wreck on the Sutherland coast.

Destruction of the Great Bridge.

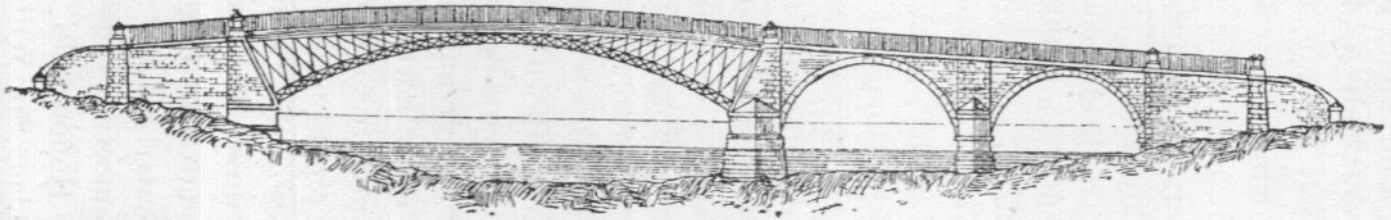
All these disasters and many more not enumerated sink into insignificance in comparison to what shortly afterwards happened. Early in the forenoon cracks were observed in the piers of the great bridge at Bonar, at the south end, and predictions were made that the bridge could not possibly survive the storm. The news spread rapidly, but public confidence in the stability of the structure was such that very few believed it, and traffic continued over the bridge almost until it fell. Indications of an impending collapse were getting more ominous as the day advanced, and, from the nature of the fissures, it was evident that the mason work was being undermined. The first break which allowed the water to sap the wall may have been caused by planks, or other heavy wreckage coming violently against it. In any case, about 2.30 P.M., the piers at the south end gave way, and down went the two stone arches in succession. About five minutes thereafter, the great iron arch of 150 feet span, which had stood the storms of 80 winters, swayed like an expiring giant, and, with an awful crash toppled over into the seething water below. The whole fabric—stone and iron—disappeared in a twinkling, and the place where it stood presented a clear waterway from bank to bank excepting stumps of two piers, one of which was barely above the surface, while on either side stood lofty jugged broken walls as if frowning at each other across the raging Kyle. The last conveyance on the bridge was a van belonging to Mr Macpherson, Bridge Hotel, which crossed about ten minutes before the collapse. Several pedestrians crossed after the conveyance, and some narrow escapes were made. One

man left Ardgay for Bonar, but remembering he had something particular to do he turned back, with the intention of crossing later on. Had he continued his journey instead of turning back it was calculated he would have been on the bridge when it fell. By the catastrophe all road communication, not only between Bonar village and railway station, but between Sutherland and Caithness and the south was suddenly snapped asunder, causing indescribable inconvenience to all, but more particularly to the populous districts on both sides of the Kyle, where the traffic was completely paralysed.

Notes on the Bridge. The bridge consisted of two stone arches with spans of 50 ft. and 60 ft. respectively, and one iron arch of 150 ft. span, with a rise of 20 ft. from the spring of the arch. When erected by the celebrated Telford, in the second decade of the century, it was considered one of the boldest engineering feats of the time, and for many years after it was completed people travelled long distances to see it. It total cost was £13,971. In drawing out the plans of this structure Mr Telford introduced several improvements affecting both the stability and external appearance of iron bridges. Two years after it was erected its strength was put to a severe test by a hugh mass of floating timber, consolidated by ice, coming violently against it without any injurious results. During a gale in 1888 a schooner was driven against it with such force that both masts were broken, while the bridge remained uninjured. By means of this viaduct the benefit of the great Highland road was extended, without a ferry, to the most northerly point in Britain. The following inscription copied from a marble slab sunk in the eastern wall may here be reproduced :—"Traveller, stop and read with gratitude the names of the Parliamentary Commission appointed in the year 1803 to direct the making of upwards of five hundred miles of roads through the Highlands of Scotland, and of numerous bridges, particularly those at Beauly, Scuddel, Bonar, Fleet, and Helmsdale, connecting those roads, viz., Right Honourable Charles Abbot, Right Honourable Nicolas Vansettart, Right Honourable William Dundas, Sir William Pulteney, Bart.; Isaac Hawkins Brown, Esq.; Charles Grant, Esq.; William Smith, Esq.; to whom were afterwards added Archibald Colquhoun, Esq., Lord Advocate;



ROSS-SHIRE. NEW BONAR BRIDGE. SUTHERLANDSHIRE.



SUTHERLANDSHIRE. OLD BONAR BRIDGE. ROSS-SHIRE.

Charles Dundas, Esq.; and Right Honourable Nathanial Bond. This building was began September 1811, and finished Novembe 1812. Thomas Telford, architect. Simpson & Cargill, builders This stone was placed here by George Dempster of Dunnichan, in the year 1815." Messrs Geo. Cowie & Son, Buckie, who took the contract for removing the wreckage from the channel, commenced operations on Saturday the 19th March, exactly seven weeks after the disaster. The divers found great difficulty in prosecuting their work owing to the dangerous nature of the bed of the Kyle, where the fallen bridge lay at a depth varying from 15 to 30 feet The opacity of the water and strength of the current also militated against them. They found that the iron arch was broken in pieces, and that trees, planks, and other *debris* had already got entangled in its network. The smashing the bridge got in its fall facilitated its removal without the use of explosives. It was dragged ashore piecemeal day by day, by means of a powerful traction engine.

The New Bridge

The Joint Committee of the Road Boards of the Counties of Ross and Cromarty and Sutherland employed Messrs Crouch & Hogg, MM. Inst., C.E., Glasgow, to advise them as to a new bridge. These gentlemen, who have had a large experience of bridge building, after a survey and a careful study of all the questions bearing on the reconstruction of the bridge, submitted a design which was approved The new bridge, an illustration of which is given, is erected in three spans, with bowstring girders of mild steel made by the Siemens-Martin process. The spans are 70 feet, 105 feet, and 140 feet respectively, the largest span being over the deep-water channel on the Sutherland side of the Kyle. The piers, which are founded on steel caissons sunk into the bed of the channel and filled with concrete, are built of granite surmounted by castellated pilasters, also of granite. The design, though less picturesque than that of the old Bonar-Bridge, is simple and effective, and thoroughly appropriate to the situation. The gradient and the gradually increasing depth of the girders are in harmony with the higher ground on the Sutherland side. The width of the roadway and footpath is 25 feet, as against 15 feet in the old bridge, which was much too narrow for the traffic it had to carry. Sir William

Arrol & Co., Glasgow, carried out the work at a cost of £12,584 17s, and the new bridge was opened in the month of July, 1893.

A Flood 45 feet deep

There was in course of construction over the River Carron, in Ross-shire, when the flood came on, a new steel girder bridge of 50 feet span, to take the place of an old timber bridge. The work had proceeded so far that the two lattice girders forming the sides of the bridge were in position, and the contractor was about to put on the flooring, which was of corrugated steel plates, and which was to have connected the two girders, when the flood came on. The river at the point spanned by the bridge runs in a narrow and rocky gorge, the bed of the river being no less than 40 feet below the level of the bridge, or 45 feet from the top of the girders. The normal depth of water at this point is 13 feet. There was thus a clear space of 27 feet between the bottom of the bridge and normal water level, and it was natural to suppose that this space was an ample margin of safety against floods. The result was otherwise. Not only did the water reach the level of the bridge, but it actually flowed over the tops of the girders, which means that the water rose 32 feet above its normal level.

Its Terrible Power

The enormous power of this extraordinary volume of water was shewn by the fact that one of the girders —a mass of steel weighing over four tons—was swept from its supporting abutments and carried to a distance of eighty yards down the river before it stranded. The other girder was thrown on its broadside on portions of the abutments which luckily remained intact. Strange to say, the volume of water formed such a cushion that the girder which was swept away sustained little or no injury, while the girder that remained on the building was very badly twisted. Four railway rails, each 26 feet long and weighing 5 cwt., were also carried away; two of them which were bolted together (weight 10 cwt.) were carried 97 yards down the river, a third 220 yards, and a fourth was swept over the falls near the junction of the rivers Calvie and Carran, over 400 yards from the site of the bridge. The Glencalvie Bridge is 12 miles above the ill-fated Bonar Bridge, in the same water, and no doubt the waters from these upper reaches contributed in no small degree to wreck Telford's Bonar Bridge.