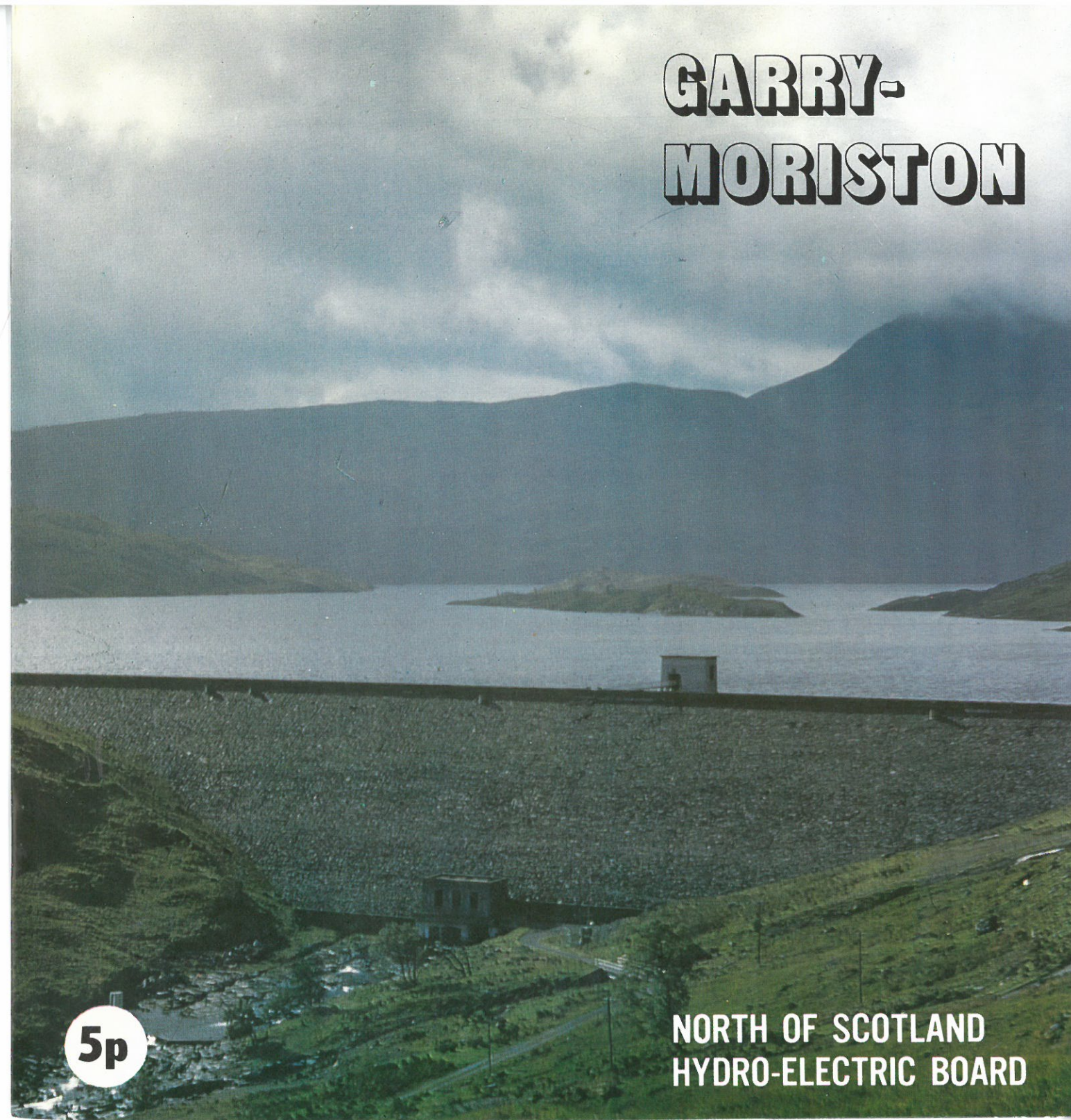


# GARRY- MORISTON



5p

NORTH OF SCOTLAND  
HYDRO-ELECTRIC BOARD





VIEW WEST FROM THE ROAD BETWEEN GLEN GARRY AND GLEN MORISTON

*The use of the waters of the River Garry and River Moriston and their tributaries for the generation of electricity was proposed in the West Highland Power Bill of 1928 and the Caledonian Water Power Bills of 1936, 1937 and 1938. The Board's developments, published in 1948, differ from the earlier private company proposals in that the water is not diverted to the West Coast but continues to follow its natural course. The amount of compensation water, too, is about five times greater than proposed in the unsuccessful promotions.*

COVER: QUOICH DAM

THE Garry scheme utilises the rainfall on 384 sq kilometres (148 sq miles) of one of the wettest areas in Britain. The average annual rainfall on the Loch Quoich catchment is 3170 mm (125 ins). In December 1954, 259 mm (10.2 ins) of rain in 22.5 hours were recorded at the western end of the loch. There are two power stations which produce about 159 million units of electricity annually.

At the western end of Loch Quoich, which is the main storage reservoir, two small cut-off dams prevent the water spilling over the watershed to the West Coast. West of these dams water from six small streams flowing into Loch Hourn is led by an aqueduct eastwards into the reservoir.

At the eastern end of Loch Quoich is the largest rockfill dam in this country. It has a maximum height of 38.4 m (126 ft), a base width of 91.4 m (300 ft) and a length of 320 m (1,050 ft). The area of the loch was increased from 7.77 sq km (3 sq miles) to 18.13 sq km (7 sq miles). In the dam there is a small generating station producing electricity from the compensation water let down the river. A spillway weir at the northern end of the dam leads into a discharge channel, cut from solid rock, the outlet of which is shaped like a ski jump, and, when heavy flood water comes over the spillway and down the channel, it leaps over the edge of the ski jump to fall as spray into the river some distance from the dam foundations. The dam is made waterproof by a thick reinforced concrete upstream face.

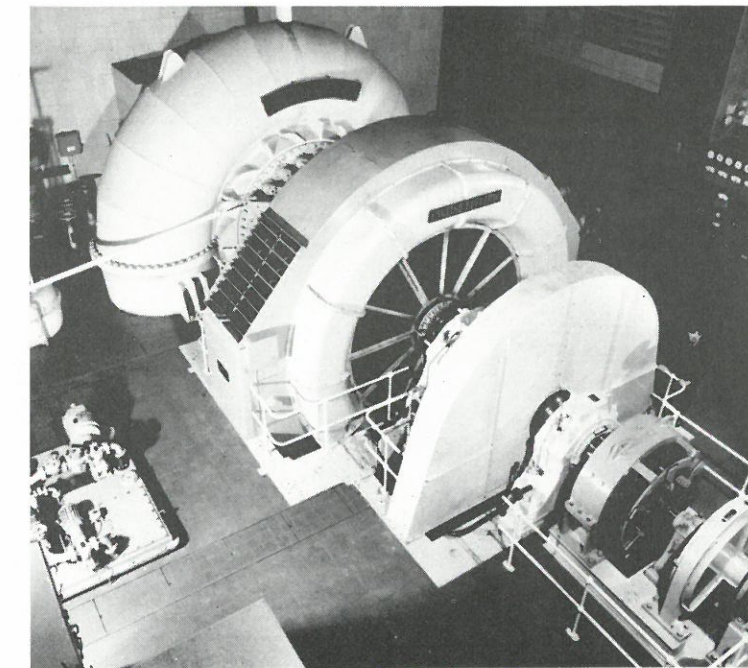
A tunnel 4.83 km (3 miles) long carries water to Quoich power station 95.1 m (312 ft) below on the River Garry upstream of Loch Poullary. This station has a capacity of 22 megawatts.

The water discharged from this power station passes downstream into Loch Garry, the level of which has been raised by a dam at its outlet, built across the gorge where the River Garry has formed

a deep channel. In this dam a Borland-type fish pass, which operates like a canal lock, enables salmon to pass up and down the river and there is also a small generator which operates on the compensation water flows.

From the dam a tunnel 5.03 m (16.5 ft) in diameter and nearly 4.83 kms (3 miles) in length carries the water to Invergarry power station near the mouth of the river at Loch Oich. Only the upper part of this station is visible from the main road, transformers and switchgear being tucked away behind the building. The station, of 20 MW capacity, operates under a maximum head of 53.3 m (175 ft), a very high head for a Kaplan-type moveable blade water turbine.

QUOICH POWER STATION TURBINE-GENERATOR

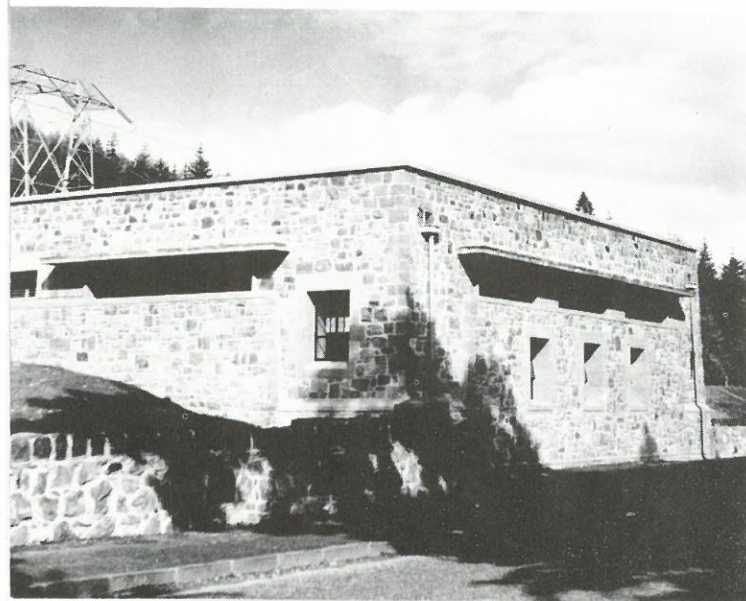






CLUANIE DAM

INVERGARRY POWER STATION



THE Moriston scheme, lying in a parallel glen to the north, makes use of the water power resources of 410 sq kms (158 sq miles) of catchment to produce annually about 216 million units of electricity. Like the Garry scheme it has an upper and a lower development each with its own power station. All the stations in the Moriston scheme are built underground.

The upper development consists of two main dams, one at Loch Loyne, the other at Loch Cluanie. Loyne dam is 548.6 m (1,800 ft) long and 21.9 m (72 ft) high. Water drawn from this dam, after passing through a small induction generator, is discharged by tunnel into Loch Cluanie.

Cluanie dam, a gravity type dam 675.1 m (2,215 ft) long and 40.5 m (133 ft) high, situated at the eastern end of the loch, raised its surface level by 29.3 m (96 ft). A small power station at the base of the dam makes use of water released to maintain a compensation flow in the River Moriston. In the construction of the Loyne and Cluanie dams blast-furnace slag, wet ground by the Trief process, was used for the first time in Great Britain in substitution for some 70 per cent of the cement. About 39,360 tonnes (40,000 tons) of ordinary Portland cement were thus saved.

Water from Loch Cluanie flows by tunnel and pressure shaft to the 20 MW Ceannacroc power station. In addition to the main turbo alternator there is a smaller machine in this station which discharges compensation water to the river at times of low load. Ceannacroc power station was one of the first underground power stations in this country. The rock has been left bare on the side walls of the machine chamber and fluorescent floodlighting emphasises this feature.

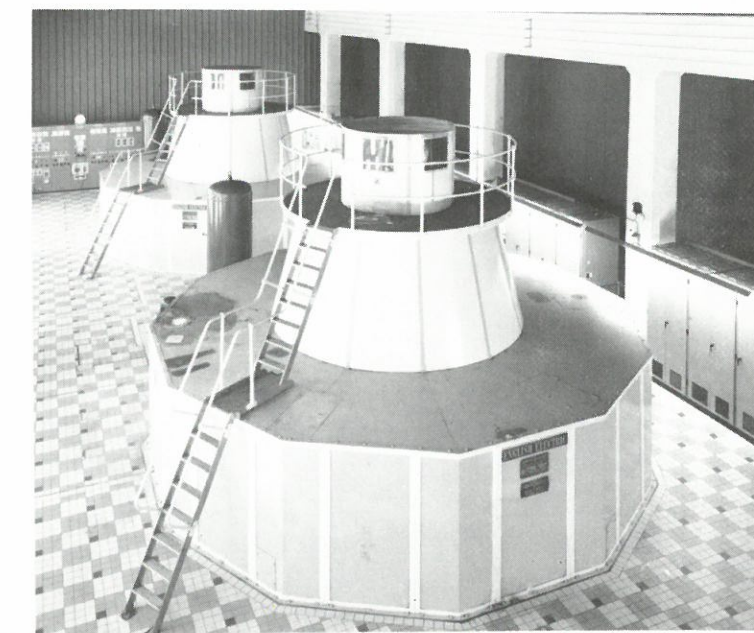
Subsidiary works in the upper part of the Moriston scheme include a branch tunnel which collects water from the upper catchment of the River Doe and conveys it either into store at Loch Cluanie or for immediate use in the power station at Ceannacroc.

At Dundreggan, 14.48 km (9 miles) downstream on the River Moriston, is the lower stage of the development. A small dam forms Loch Dundreggan, a headpond, the water level of which is controlled automatically by sector gates. A small

power station in the dam delivers additional compensation water down the river and, so that fish can continue upstream as far as Ceannacroc, a Borland type fish pass has been provided.

Directly beneath the dam at a depth of 91.4 m (300 ft) is the underground Glenmoriston power station. The water drops down a vertical shaft to the two 18 MW turbine generators and is discharged into Loch Ness about four miles away through a tailrace tunnel of over 6.1 m (20 ft) equivalent diameter.

GLENMORISTON POWER STATION



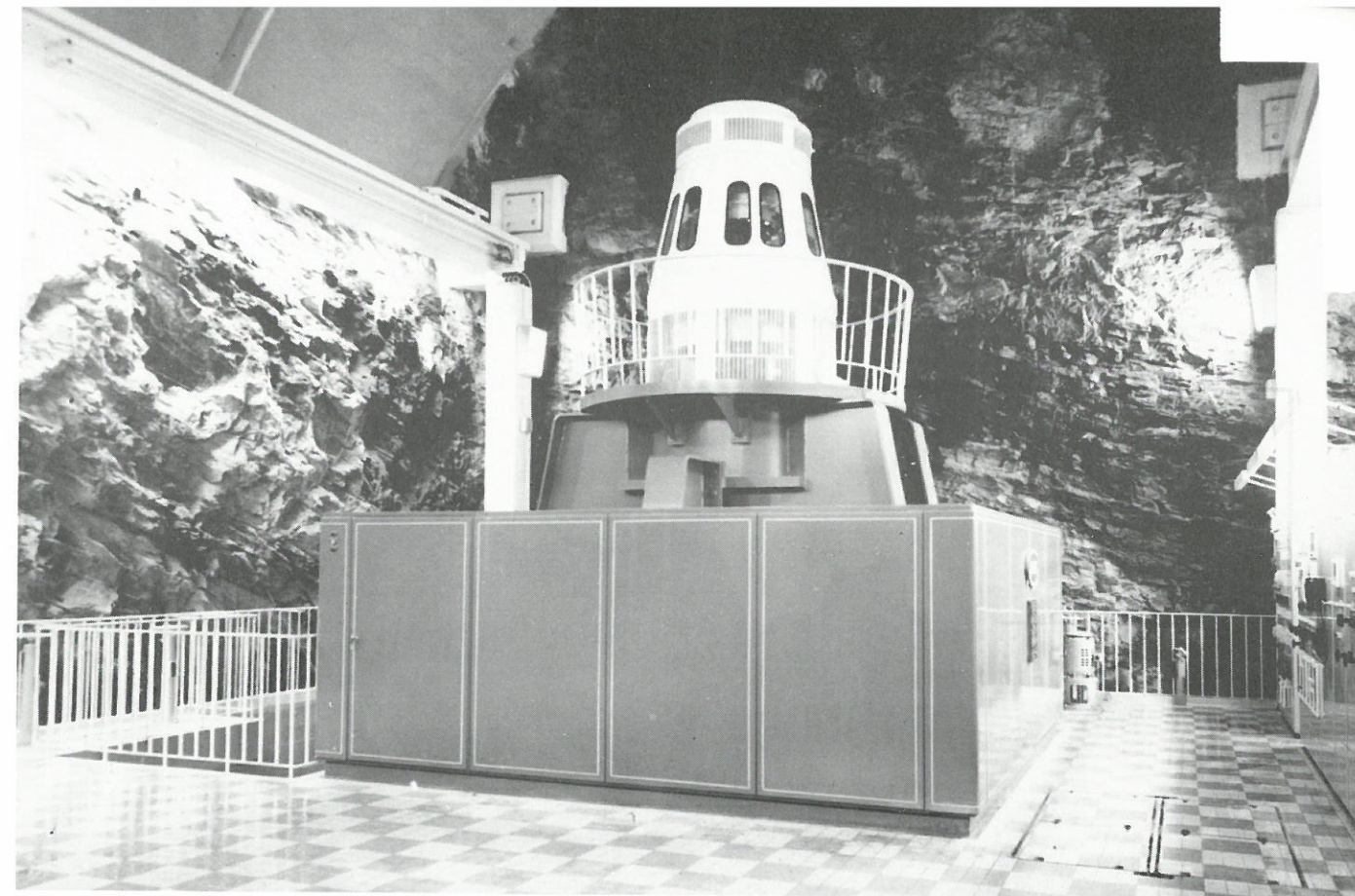
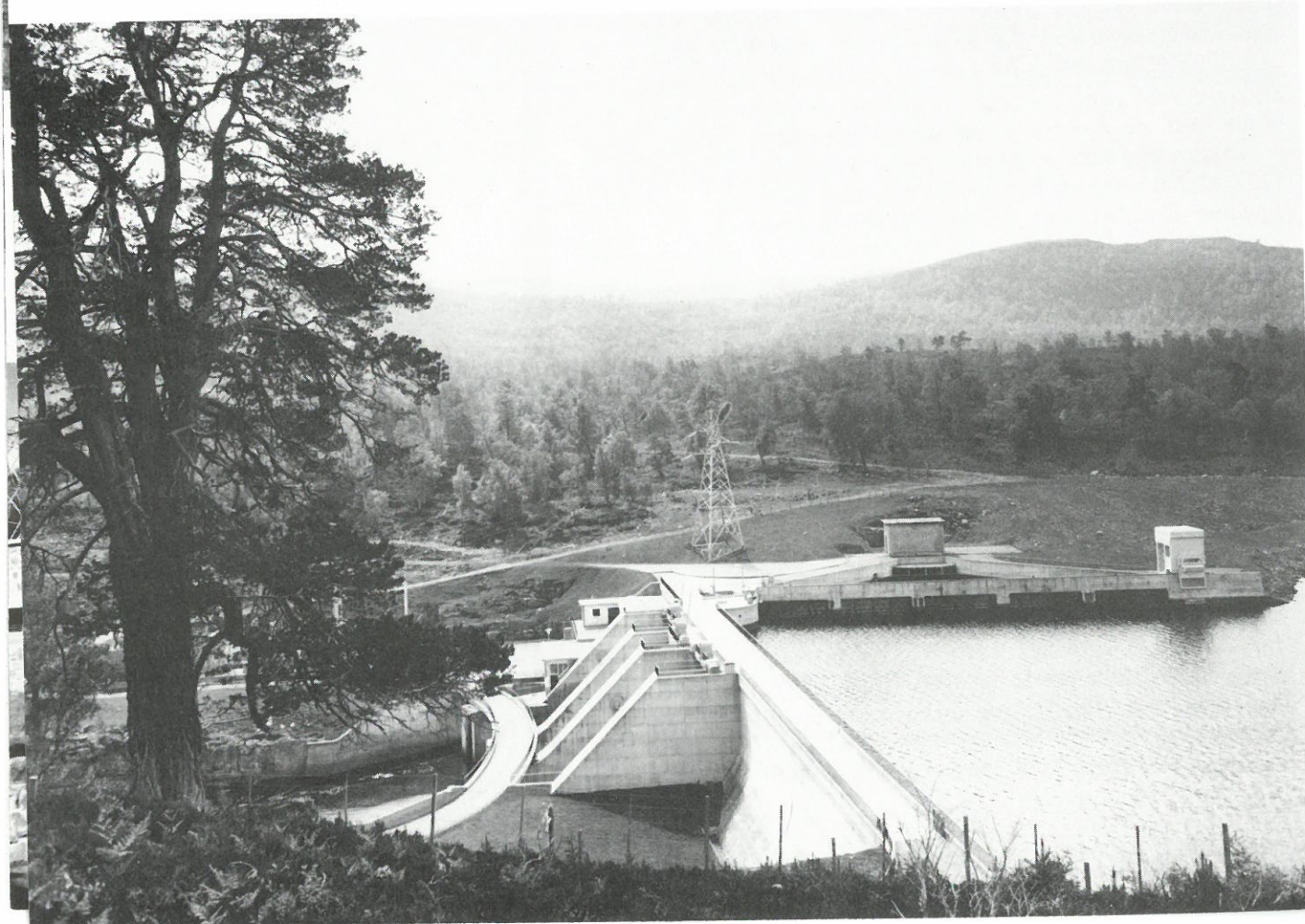


North of these main works is the subsidiary Livishie development. An aqueduct system collects water from hill streams flowing into the River Moriston downstream of Dundreggan and carries it to a headpond on the Allt Blairaidh from which it flows by tunnel to the Livishie power station. Storage is provided by three high-level lochs where there are small dams the discharge from which can be regulated by remote control from Glenmoriston power station. Livishie power station, which has a capacity of 15 MW, is hidden inside the hill. It

discharges into Loch Dundregan through a short tailrace tunnel.

The control centre for the Great Glen Group, comprising the stations in Glen Garry and Glen Moriston and the pumped storage station at Foyers on Loch Ness, is at Auchterawe near Fort Augustus. The control facilities for Ceannacroc, Livishie, Glen Moriston, Invergarry and Quoich power stations are provided by solid state equipment over power line carrier circuits.

DUNDREGGAN DAM



LIVISHIE POWER STATION

From Auchterawe 132 kV lines go north to Fasnakyle switching station in Glen Affric, east over the Corrieyarrick Pass to Errochty and over the Lech Pass to Craigiebuckler switching station at Aberdeen. Another goes south-west to Fort William into which the output of the Quoich and Invergarry power stations is fed. The output of the stations in Glen Moriston is fed by single circuit line direct to Fort Augustus. The switching station at Auchterawe is equipped with a fault locator

which by injecting high frequency pulses into live lines and measuring echo time can locate faults on the very exposed lines which cross the Corrieyarrick Pass at a summit of 764 m (2,507 ft) above sea level.

As part of the construction of the Garry/Moriston schemes roads in both glens were improved and a new road built between Glen Garry and Glen Moriston is now one of the main tourist routes to Skye.



## Garry-Moriston — Catchment Area

