

**ANCIENT FISH TRAPS
ON THE NORTH AYRSHIRE COAST:
ARDROSSAN TO HUNTERSTON**

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INTRODUCTION

A variety of ingenious methods of capturing fish in tidal waters are in use today by primitive societies in many parts of the world, and generally similar methods have probably been in use in the British Isles from earliest times (1, p.98).

In Ireland, a detailed study has been made by Dr. A.E.J. Went of the methods formerly used in the capture of salmon and other fish. In a series of important papers, of which two may be mentioned, he has categorised 'fishing engines' in analytical detail (2,3). What Went terms 'fixed engines' are more or less permanent structures positioned between tide marks on the coast or in river estuaries so that fish are carried over or through them on the flood tide and become trapped on the ebb. Such constructions, in their simplest form, are V-shaped walls or weirs probably with provision for an attended net or wickerwork grid to be placed in a gap or gate at the apex of the V during the ebb. In a river mouth site advantage was taken of the known behaviour of fish to move up the estuary on the flood and downstream on the ebb. On a shore, the operation of the trap would perhaps be less efficient and predictable, but it would at least have provided a few fish for subsistence purposes, and more if baited. In modern times, with urban pollution and intensive offshore trawling, the catch of these 'fixed engines' would be greatly reduced.

Weirs may be made of boulder walls, or of wooden stakes and wattle, or a combination of the two. The choice of materials would depend upon the availability of suitable boulders or of a satisfactory substratum to accept wooden stakes (2).

Also in Ireland, Dr. Estyn Evans has recorded arcuate fish traps made of boulders on the Mourne shore of County Down, near Newcastle (4). Other traps have been noted on the shores of Belfast Lough (5) and Strangford Lough (6,7).

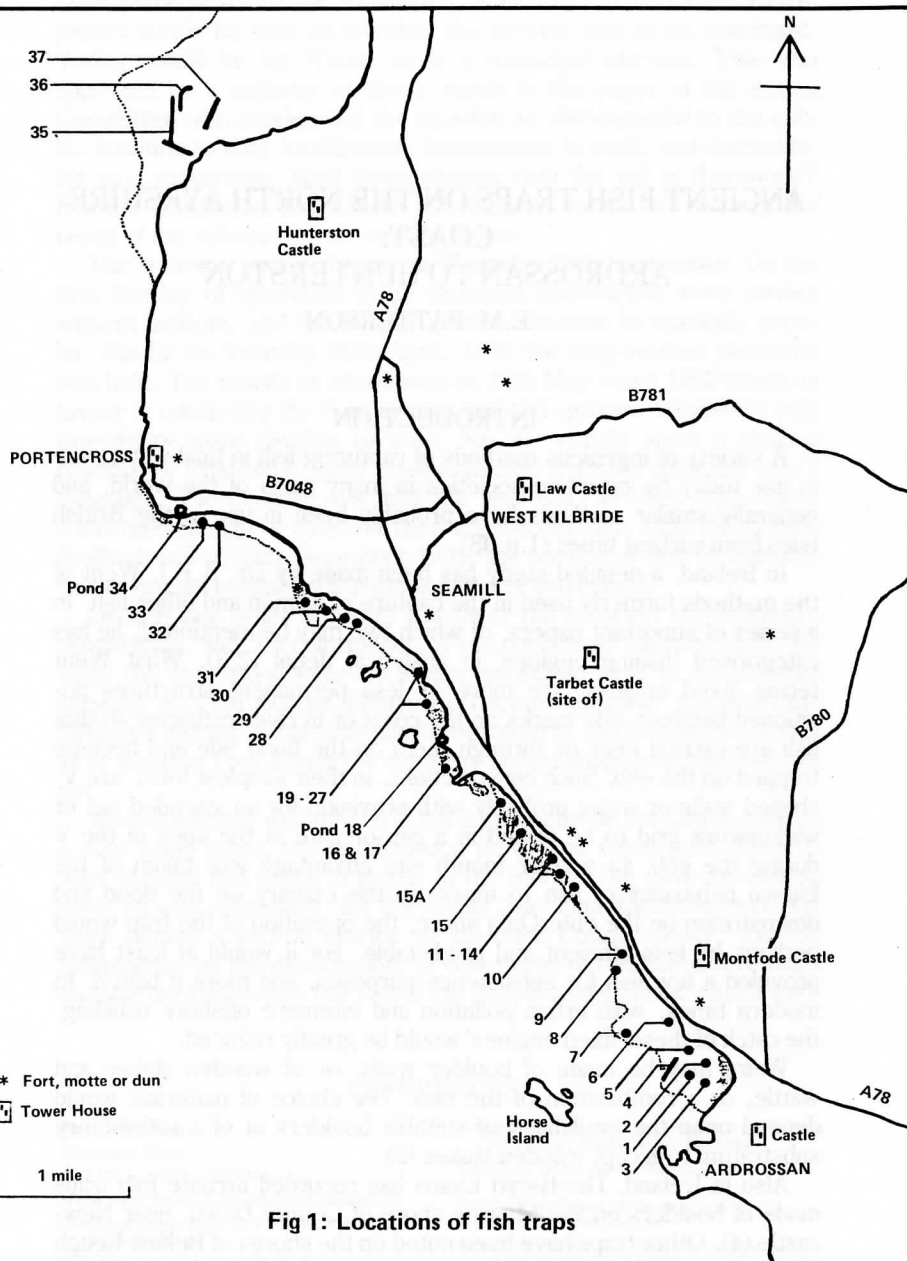


Fig 1: Locations of fish traps

These constructions have been variously named yair, weir, pound, croy, cruive, garth, caraidh, engine and trap. In this description, the last of these terms will be used.

A number of references have been made to fish traps along the Scottish coast. Estuary traps are mentioned in 1845 from Shetland (8) and more recently by Bathgate (1) from near Inverness and from upper Loch Broom. Ferrier has noted semicircular examples on the north shore of the Clyde at Ardmore Point, and has recorded no less than eleven on the Island of Bute and one in Lamlash Bay on Arran (9). Mackenna has found one at Barmore Island in Loch Fyne (10) and Ferrier notes another Argyll trap in Airds Bay, Appin (9). More recently the Royal Commission on the Ancient and Historical Monuments of Scotland has described four further traps on the coast of Argyll: on Lismore Island (11, p.186), on Morvern (12, p.190) and on the south and north-west coasts of the Isle of Mull (12, p.226 & 251). Most appear to be of considerable but undefined antiquity, and now consist entirely of alignments of boulders, the inorganic remnant of structures that were probably composite.

Examination of the 14 km. of coast of the Firth of Clyde from Ardrossan northwards to Hunterston has disclosed the existence of an unexpectedly numerous collection of boulder alignments totalling 35, most of which appear to have been fish traps, rather than primitive harbours. In addition two supra-tidal ponds occur which were possibly excavated to hold live fish that were netted in nearby traps.

All of their constructions are now greatly damaged, by scattering as a result of wave action and to a less extent by plundering for later civil engineering works such as road foundations. The purpose of this paper is to record, describe and classify these constructions, and tentatively to attempt to relate them to the local geology and to prehistoric and historic places of residence.

GEOLOGICAL SETTING

Both to understand the functioning of the traps and their siting, a knowledge of the local geology is helpful. The solid geology of most of the coast is made up of sedimentary rocks of Upper Old Red Sandstone age, mainly sandstones which are occasionally pebbly. They have a general regional dip to the south-east of about 15° . At Farland Head, just south of Portencross, the strata have been folded and faulted, the Upper Old Red rocks dip vertically in the core of the fold and two small areas of folded Downtonian and Lower Old Red Sandstone rocks occur on the coast for 1 km. to the north. Together this disturbed area constitutes the Farland Head Ruck (13,14,15). To the north, Upper Old Red Sandstone re-appears, with nearly level dips below the Hunterston Power Stations. The Upper Old Red rocks involved in the Farland Head Ruck zone can be traced across the

Hunterston peninsula to the northern coast at Fence Bay and Black Rock.

Intrusive igneous rocks occurring as dykes of basalt, dolerite and trachyte, and as sills of similar rock types, penetrate the sandstones. Being harder than the latter, when the dykes and sills are found on the coast they generally form ridges or headlands. In one way or another, many are involved in fish trap constructions. Inland, volcanic vents plugged with basaltic agglomerate form hill features while two vents on the coast at Hunterston Power Stations and Black Rock have been planed down to sea level (16).

The Pleistocene Ice Age, comprising several glacial periods with warm interglacials, had a profound effect on the area (17). Higher sea levels produced marine erosion platforms at several levels of which the most prominent and latest forms a raised beach platform at about 5 metres above present mean sea level. The coast road (A.78) from Ardrossan northward is constructed as far as Seamill along the margin of this raised beach. Glacial deposition blanketed land under 200 metres and the floor of the Firth of Clyde with a red-brown, sandy, lodgement till containing numerous abrasion-resistant, erratic boulders mainly of igneous origin. These boulders were plucked by the moving ice sheet and survived transport below and within the ice by reason of their superior hardness. Angular when plucked from their source to the north, they developed a sub-rounded to sub-angular form during transport, typically with several facets abraded to gently curving surfaces.

It is such boulders, freed from their clay matrix, that were generally utilised to build walls in fish trap construction. Inland, the lodgement till can be seen to have been moulded by the north to south flow of the ice into drumlins and drumlinoid forms, and into streamlined tails in the lee of the resistant volcanic crags forming Tarbert Hill (NS 211472), Drummilling Hill (NS 207493), Auld Hill (NS 178491) and at Carlung (NS 195494).

During the final downwasting of the ice sheet at the end of the last glacial period, meltwater escaping through and under the ice trenched deep channels into the till and the underlying rock. These meltwater channels were subsequently uncovered and occupied by misfit streams, well seen in the courses of Glen Burn, 2 km. ENE of Hunterston Castle (NS 210523), the Kilbride Burn above Seamill (NS 205472) and Gourock Burn for 1½ km. above its mouth (NS 215455).

Following the dispersal of the ice, the climate grew warmer as the Firth of Clyde was invaded by the sea. Wave action along the coast was free to attack the raw veneer of till, and the clay and sand in it became dispersed, being deposited on the sea floor, while the massive rock constituents, termed boulders, cobbles or pebbles in decreasing

order of size, were accumulated on the beaches. The larger boulders, by their weight resistant to storm wave displacement, found themselves perched in vast numbers on the irregular, ice-plucked sandstone shelves. The less weighty fragments of cobble and pebble size were rolled by waves, became abraded and lost their facets in the process. In places accumulated beach sands have blanketed these rock fragments. In several places, especially dense accumulations of boulders, cobbles and pebbles remain, and it is suggested that their local abundance is possibly the result of the removal of offshore drumlins by marine erosion. These boulder concentrations occur at North Bay and Yellow Craigs near Ardrossan, at the south-east end of Ards Bay, and at Brigurd Point. The size of the larger boulders will have been directly influenced by the joint spacing in the parent intrusions. The largest are usually of brown trachyte or felsite, and have probably been derived from the sill intrusions of Goldenberry Hill, Biggles and Fairlie. Large granite boulders are not common, but their light colour makes them conspicuous among the black basalts and dolerites. Tough quartz-schists, of Highland source, are also light coloured but are even less numerous than granites.

The rock platform or bench forming the lowest raised beach is veneered by sand, and by wave-rolled pebbles. Part of it is built on, but much of it is intensively cultivated for early potatoes. Two ponds, now supra-tidal, were excavated in the raised beach at Farland Head (NS 179485) and west of Chapelton Farm (NS 203463). Neither pond is the result of marine or stream erosion. It is possible that, since they were put into use, tide levels have fallen slightly and they are, consequently, brackish and entered by the sea only at spring tides.

LOCATION AND SUMMARY DESCRIPTION OF BOULDER CONSTRUCTIONS LISTED FROM SOUTH TO NORTH

No. on Map	National Grid Reference (NS)	Remarks
1,2,3	227432	Possibly three ruined constructions in beach, SE of disused sewer pipes. Form uncertain. Now partly buried by accumulated sand. Ardrossan Castle 1km. to SE. No alignment visible.
4	225434	Complex of 5 connected alignments near HWM, in association with rock outcrops, at mouth of Montfode Burn. Total length c. 200 m. Montfode Motte 0.4 km. NE, Montfode Castle 0.9 km. NNE.
5	223431	Massive straight wall nr. LWM in stony area

6	223436	of Long Craigs. Length ca. 150 m. Function uncertain, possibly a primitive breakwater. Vague alignment, probably robbed, on sand, nr. HWM.
7	219435	Wave dispersed dam to SW of 'tidal pond' (OS 6' map), nr. LWM.
8	219442	Group of piled boulders, max. size 3m ³ .
9	218443	Perfect crescentic trap of small boulders on sand, bet. LWM and HWM. Circumference ca. 25 m. Gate faces NNW. Visibility greatly dependant on sand level. Boydston Fort 0.7 km. N, Montfode Castle 0.6 km. ESE.
10	215448	Possibly robbed box trap of massive boulders nr. HWM, below Loup Cottage. Boydston Fort 0.4 km. E.
11	214449	Based on massive granite boulder at HWM. Poss. robbed for adjacent road construction. Extends 80 m. towards LWM. Second short alignment, offset, nr. LWM.
12	214450	Well-constructed, based on bedrock, but wave scattered to NW & SE. Ill-defined arc of large boulders nr. LWM retains tidal pond.
13	213451	At Gourock Burn, 80 m. linear wall from nr. HWM. Terminates seaward against rock outcrop. Scattered remnant to N, nr. LWM may have formed V-trap. 'Double Fort' (215454), 0.3 km. NNE.
14	211454	Seaward of tidal pond. Large boulders, many gaps, some scattering. 'Double Fort' 0.5 km. E.
15	204461	Tidal pond, retained by rock shelves, raised on S by quarried sandstone slabs, and on N by basalt boulders, both covered at HW. Pond drains at LW into pond held by 16.
16	203462	Discontinuous boulder wall ca. 150 m., founded on N-S dyke of dolerite, pond retained to S by sandstone outcrop, to N by dolerite sill of North Inch. Upper courses of wall dispersed by waves to E, but retains pond.
17	204463	Excavated brackish pond ca. 1 ha. in raised beach. Short canal to shore has gate in NE-SW dyke of dolerite (continuation of dyke in 16). Site of Tarbet Castle 1 km. NE; Seamill

18	203464	Fort 0.8 km. N. Canal blocked May 1980. Small tidal pond on rock shelf, retained by small N-S dyke of dolerite. Boulders of superimposed wall dispersed nearby.
19	204465	V-shaped trap nr. HWM. Convergence of boulder alignment and NW-SE dyke of dolerite.
20	202564	Seaward from 19 on N. side of 2 m. NW dyke, nr. LWM. Boulders in sand floored gully below summit crag of dyke.
21	202466	At intersection of two basalt dykes, towards LWM. Tidal pond drains via gate in N-S dyke. Boulders scattered above and below gate.
22	203466	Isolated group of 4 very large boulders in line, 50 m. below and parallel to HWM. Possibly remains of box trap.
23	202467	Wave- scattered accumulation of whinstone boulders and dressed sandstone blocks with tool marks, at seaward end of sand floored gully, between sandstone outcrops.
24	202467	50 m. N of 23, similar gully site between sandstone outcrops. Retaining wall to N built of sandstone blocks on outcrop. Scattered basalt blocks in gully nr. LWM. Cut slot in outcrop to S terminates in basin. Retains small tidal pond.
25	201468	Scatter of basalt boulders in sand-floored gully, 100 m. W of 26, possibly wave-damaged arcuate wall. Retains small tidal pond.
26	202468	On red sandstone outcrop, boulder alignment, some scattering. May have retained pond on NW side. Seamill Fort 0.4 km NNE.
27	201471	At Kilbride Burn, N side. Large basalt boulders nr. 2 m. dolerite dyke, but robbed for sea-wall foundations. Seamill Fort 0.2 km E.
28	195475	Ten boulders in straight line at stream, other scattered boulders nearby. Possible remains of box trap.
29	195476	Slightly curved double alignment of large igneous boulders runs from HWM for 57 m. Ill-defined 2 m. gate and boulder walls may

- 30 192477 have led to tidal pond, now sand-infilled. Massive alignments and rock outcrops retain tidal pond.
- 31 190478 Lengthy (135 metre) L-shaped wall of large to very large boulders retains tidal pond, ca. 5000 m². Alignment has many gaps, several large granite boulders, interstitial stones thrown alongside. Portencross Castle 1.5 km. NW.
- 32 183485 N-S alignment of large boulders on sand, from HWM.
- 33 181486 Grouping of large boulders nr. HWM on stony shore. Possibly a robbed box trap.
- 34 179485 Excavated shallow pond in raised beach sands, overlying vertically dipping Old Red Sandstone strata. Pond opens to HWM on E at cross wall of large boulders, mainly sandstone and possibly made continuous later with fence. Pond extends W for 105 m. terminating in sinuous canal ca 1 m. wide. Cross wall of boulders with central gate, 30 m. from W end. Several pits cut in sand and gravel to N. have narrow canal connections to main pond. Excavated material from site may form mound seen to N of W end of pond. Portencross Castle 0.5 km. NW.
- 35-37 182519 to 180525 On flat platform of sand and red clay, between HWM & LWM. (see ref. 21, p.16 and 22, p.14). Complex of low boulder walls extend from HWM, to WNW, then N, may be causeways for access to 2 tidal traps of V-shape, and at least one arcuate trap. Three boulder cairns may be markers or refuges. Long boulder walls associated with old post and wire fence near HWM.

DISCUSSION

That about thirty-five remains of coastal fish traps have been recognised by the author along 14 km. of coast must not be interpreted as indicating that they were in use simultaneously. Rather, they are tentatively envisaged as the relics of man's efforts to obtain a source of protein food over a very long period, perhaps as much as 3000 years.

Neither the dates of construction of individual traps, nor the duration of use, are known, and the author is not aware of a method of determining these parameters, from the inorganic remains that can be seen to-day. Further exploration might expose post holes, and if wood stumps were found there, carbon isotope dating might be possible.

The coast that has been surveyed is open to the prevailing south-westerly wind and, with the long fetch of the Firth of Clyde, storms can build up large waves, but offshore shallows and islets cause these to break at or below LWM, thus preserving some traps from rapid destruction. A number of factors may be envisaged which will influence the ability of a trap construction to survive:

1. Robustness of the original construction.
 - 1.1 Size and weight of boulders.
 - 1.2 Height of construction above foundation.
 - 1.3 Shape of boulders.
 - 1.4 Amount of interstitial packing by smaller pieces of stone.
2. Degree of exposure to destructive wave action.
 - 2.1 Length of fetch of storm waves.
 - 2.2 Maximum wind velocity in storms.
 - 2.3 Orientation of alignment relative to approaching waves.
 - 2.4 Distance below HWM.
 - 2.5 Presence of rock outcrops or islets to break approaching waves.
3. Age of the trap.
4. Amount of post-constructional repair work.
5. Tidal range.
6. Alteration of local mean sea-level since construction.
7. Degree of robbing for foreshore developments.
8. Burial by accumulated sand.
9. Exposure by removal of sand.

The determination in the field of the site of a ruined trap is partly a matter of the degree of destruction that it has suffered, and partly a matter of observational experience. An observer familiar with the geology and topography of a particular stretch of shore may notice the anomalous linear grouping of a number of boulders, or the existence of a tidal pond held back by rock outcrops and the remains of a wall. To extract the maximum amount of information the shore should be scrutinised at all stages of the tide, and under calm and storm conditions.

Almost without exception, the builders of the traps listed above made use of the glacially faceted boulders which they found lying on the beach in vast numbers, in a wide size range, and in random

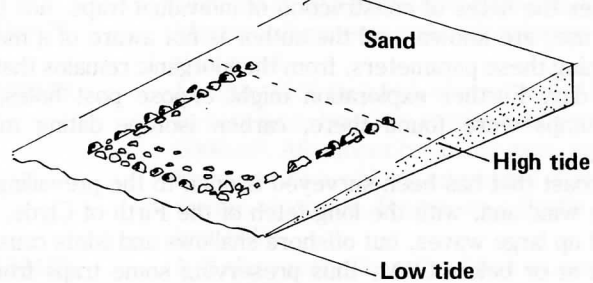


Fig 2: Rectangular "box" trap

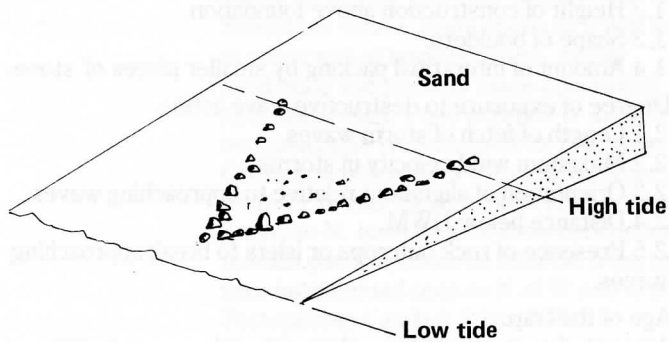


Fig 3: V-shaped trap

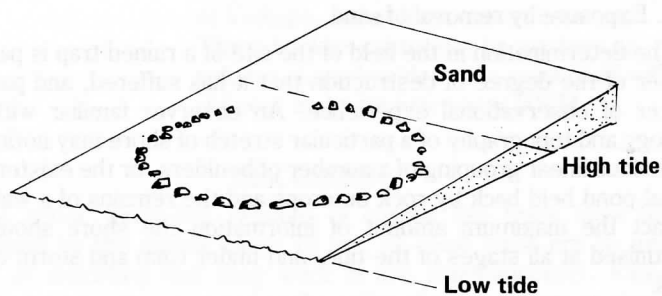


Fig 4: Crescentic trap

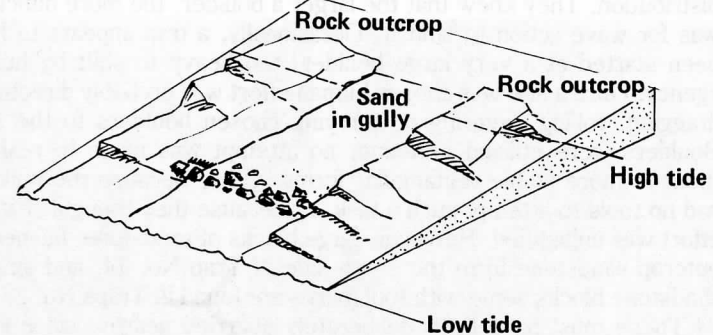


Fig 5: Wall across gully in rock outcrops

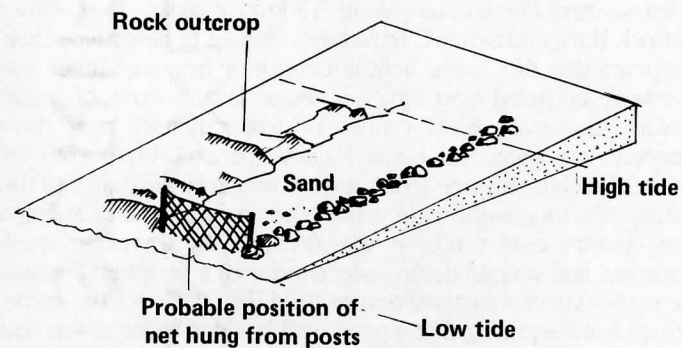


Fig 6: Linear trap close to rock outcrop

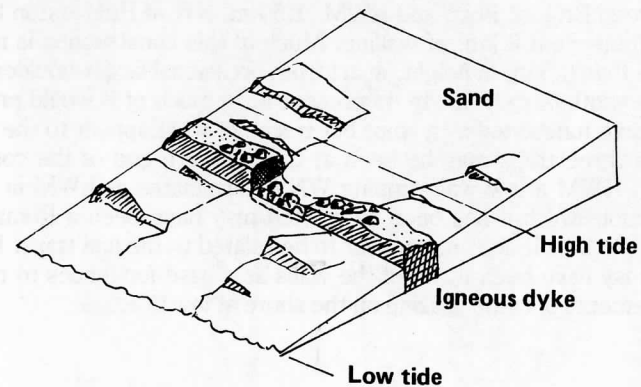


Fig 7: Trap containing wall founded on dolerite dyke

distribution. They knew that the larger a boulder, the more difficult it was for wave action to shift it. Occasionally, a trap appears to have been started at a very large boulder, too heavy to shift by human agency. Once a site was chosen human effort was probably directed to dragging, rolling, levering or carrying chosen boulders to the site. Boulders were utilised as found; no attempt was made to reshape them to more stable rectangular forms, either because the builders had no tools to attempt such a task, or because they thought that the effort was unjustified. However, large blocks of sandstone, heaped on outcrop sandstone form the south side of Trap No. 14, and smaller sandstone blocks some with tool marks are found in Traps No. 23 and 24. These must have been deliberately quarried nearby, since large sandstone blocks do not occur among beach boulders. Already commented on in the Table above is the proximity of these traps and ponds to the earth 'Forts'. Eight of the latter are sites between Ardrossan and Portencross along 7.5 km. of coast. Two of these, at Gourock Burn and Seamill, have been studied to determine their age. It appears that they were built in Bronze or Iron Age times and may have been occupied over long periods as local centres of population. Similarly there are eight castles or tower houses near the coast between Ardrossan and Fairlie. They are of 13th to 15th century construction but only one (Hunterston) was in occupation into the 19th century. Portencross Castle was at the seaward end of an important cross-country road route. It was occupied by travelling royalty on occasions, and was no doubt associated with a peripheral settlement. The earlier vitrified fort and dun on Auld Hill overlooks the castle. It is perhaps not surprising that a pond with boulder barriers was made on Farland Head to contain freshly netted fish, not far from this centre of population.

The most extensive and complex boulder constructions occur between Brigurd Point and HWM, 1.5 km. NW of Hunterston Castle, and total about 2 km. of walling. Much of this construction is now no more than 0.5 m. in height, apart from occasional larger boulders, and has a width of ca. 2 m. In its present form much of it would probably not have functioned as a trap, but traces of what appear to the writer to be three traps may be seen at the northern end of the complex. From HWM a low wall running WNW terminates at LWM in a construction which it has been suggested may have been a Roman harbour (21,22). It does not appear to be related to the fish traps. Recent use may have been made of the walls as a base for fences to restrict movements of cattle grazing on the shore at low tide.

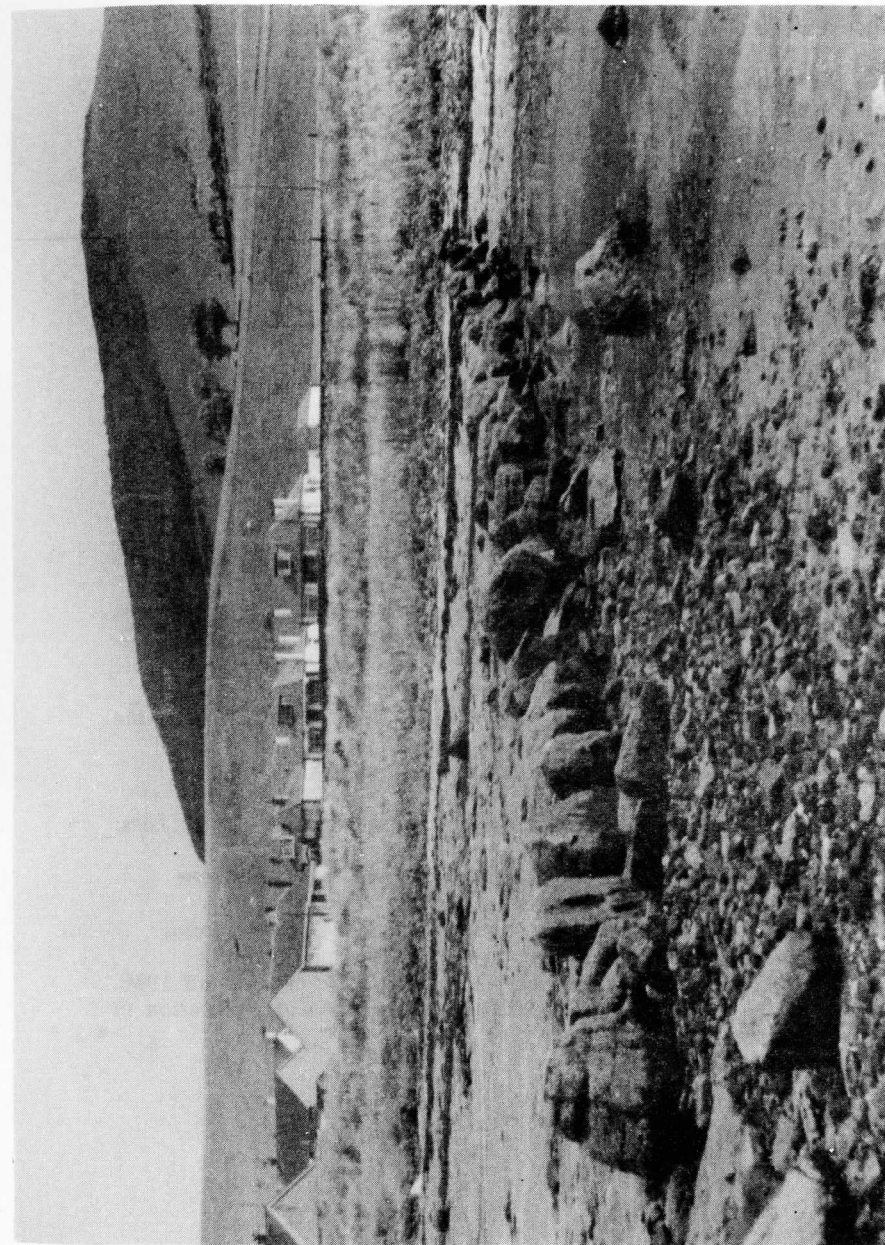


Fig 8: View of trap 19 to NE
Boulder Alignment at NS 204 465, constructed to converge on NW-SE dyke

LITERATURE REFERENCES

1. Bathgate, T.D. (1948) Ancient fish traps or yairs in Scotland. *P.S.A.S.*, 98.
2. Went, A.E.J. (1946) Irish Fishing Weirs. *J.R.S.A.I.*, 76, 176.
3. Went, A.E.J. (1964) The pursuit of salmon in Ireland. *Proc. Roy. Irish Acad.*, 63 C, 191.
4. Evans, E.E. (1951) *Mourne Country*. pp. 181-2. Dundalk.
5. Evans, E.E. (1951) *Ulster J. Archaeology.*, 14, 48.
6. Young, R.M. (1896) *Historical Notices of Old Belfast*, p. 143. Belfast
7. Ordnance Survey Memoirs (1834) Box 23. Down 1.XII. Ballyphilip Parish.
8. *New Statistical Account, Scotland* (1845) vol. 15. Shetland, parishes of Sandsting and Aithsting.
9. Ferrier, J. (1969) Tidal Fish Traps in Bute. *Tr. Bute. Nat. Hist. Soc.* 17,31.
10. MacKenna, F.S. (1971) The Stonefield Yair &c. *The Kist*, 2.
11. *Inventory of Argyll*, vol. 2 (1975) Royal. Comm. Ancient & Hist. Monuments Scotland, p.186.
12. *Inventory of Argyll*, vol. 3. (1980) Royal Comm. Ancient & Hist. Monuments Scotland, p. 251.
13. Bluck, B.J. (1967) Deposition of some Upper Old Red Sandstone conglomerates in the Clyde area. *Scot. J. Geol.*, 3, 39.
14. Patterson, E.M. (1951) The Old Red Sandstone rocks of the West Kilbride-Largs district Ayrshire. *Trans. Geol. Soc. Glasgow*, 21, 207.
15. Downie, C. & Lister, T.R. (1969) The Sandy's Creek Beds (Devonian) of Farland Head, Ayrshire. *Scot. J. Geol.* 5, 193.
16. Patterson, E.M. (1973) in *Excursion Guide to the Geology of the Glasgow District*. (Geol. Soc. Glasgow). Glasgow.
17. Sissons, J.B., (1967) *The Evolution of Scotland's Scenery*, Edinburgh.
18. Sissons, J.B. (1976) *The Geomorphology of the British Isles: Scotland*. Lond.
19. Morrison, A. (1978) The Bronze Age in Ayrshire. *Collections Ayrshire Arch. & Nat. Hist. Soc.*, 12, 125.
20. Lamb, J. (1896) *Annals from an Ayrshire Parish: West Kilbride*. Glasgow. (Reprinted 1979 by West Kilbride Amenity Soc).
21. Newall, F. (1967) in *Discovery and Excavation in Scotland* 1966.
22. Newall, F. & Lonie, W. (1973) in *Discovery and Excavation in Scotland* 1972.