

CHAPTER IV.

LEAD AND ZINC ORES (*continued*).

AREA II.

THIS area comprises the country lying between Area I. on the south, and the practically east-and-west line which forms the northern boundaries of the counties from Argyllshire on the west to Kincardineshire on the east. Except in Fife, the country-rock is nearly in all cases either of igneous or of metamorphic origin. A glance at the map (Plate I.) shows that a highly mineralised belt of country stretches north-eastwards from Islay to beyond Loch Tay, a distance of over 100 miles. Along the whole of this belt the country-rock are principally quartzites, quartzose flags, mica schists and limestones. Many of the veins trend north-east, but others with N.N.W. and east-and-west directions are known. In the Strontian district all the veins belong to the last set, and are in nearly every case accompanied by highly decomposed dykes of basalt. Some of the veins in Islay also belong to this set.

A few of the mines in this area, such as those at Strontian, Tyndrum, and Islay, have been worked on a fairly large scale, but most of them consist only of small workings, and are of little or no value.

ISLAY.

Numerous old mines and trials for lead ore are known in Islay, an island situated off the west coast of Scotland, and reached by steamer from Glasgow to either Port Askaig or Port Ellen *via* West Loch Tarbert. The veins occur in the stretch of limestone country which extends from Port Askaig to Bridgend, and are most numerous near the village of Ballygrant. Most of the workings are quite near the roads, which are in good condition.

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 198 and 209.

Geology.—The district in which the veins occur is composed essentially of a thin series of slightly metamorphosed rocks consisting of :—

Blue limestone (Islay Limestone).

Black slates and phyllites (Esknish Slates).

The slates are well exposed near Esknish, between Bridgend and Ballygrant, where they were formerly extensively quarried. The overlying Islay Limestone is a massive bed some 50 ft. in thickness, which has been quarried and burnt for lime. This is the rock in which veins are productive. The earth movements to which the area has been

subjected have caused the strata to be bent into a series of shallow folds, both limbs of which dip to the west, and whose axes strike in a north-east direction. Owing to this type of folding, and to the thinness of the limestone, none of its outcrops is of any great extent, and the depth of the individual masses is small. The trend of most of the veins is across the strike of the limestone outcrops. The size of the ore pockets is consequently limited, and there is little likelihood of the veins being productive in depth, since the underlying slates are not the type of rocks to yield fissures suitable for the deposition of minerals.

History.—The lead mines of Islay have been known for a long time, and are said to have been worked by the Danes or the Norsemen. The first authentic record is for the year 1549, when Donald Monro,* Dean of the Isles, in a description of his tour in Islay, makes the statement "In Illa is meikle lead ure in Mochylls."

In 1616 a patent of the copper and lead mines of Islay, Mull, Skye and Lewis was granted to Archibald Primrose,† and it was suggested that a number of Englishmen should be brought to work the mines. In a letter from Sir John Campbell, dated 1680, we find that he agreed to let the mines and minerals of Islay to a number of gentlemen, who were also to farm the whole island and pay three years' rent in advance, and so on from three years to three years. In consideration of the loss of interest on this money he agreed to abate £1000 from the total rent. The Kildalton charter chest contains several accounts of mining schemes in Islay, and a brief résumé of some of these is given below. The first is undated, but gives an account of operations from 1720 to about 1760. The writer had known the mines for forty years; at which time they were in the hands of the Glasgow Company. He states that their lease was about ended, and the men were employed washing the old dumps and taking the ore out of the richer portions of the veins. Soon after this Sir A. Murray of Stanhope leased the mines. He does not appear to have been to Islay himself, but placed a local man who had little or no skill in charge, with the result that no systematic work was done. Eventually the proprietor intervened and took the mines into his own hands. He worked them for a few years, but afterwards let them to Squire Haily. The arrangement does not appear to have worked smoothly, as we find that the smelting mill and tools were arrested, and laid up in Little Glasgow (Glasco Beag). The mines were then leased to Capt. William Thynne (by whom the writer of this article was employed), who went to Islay in 1745. He would not interfere with the arrested tools, but made new ones of his own and employed twelve men. The rebellion, however, broke out, and the captain returned to England, and any ore that had been raised was taken to Clydeside the following April.

The writers of some of the papers in the chest go into great detail in their descriptions of the individual workings, and these are incorporated into the accounts of the various mines given later. (The reports can be seen in full in "The Book of Islay," pp. 458–467.)

* Gregory Smith, "The Book of Islay," 1895, p. 475.

† *Op. cit.*, p. 365.

Pennant * visited the island in the course of his tour. At that time the manager of the mines was a Mr. Freebairn, and the ore was smelted in an air furnace near Freeport (just north of Port Askaig). Williams,† who went to Islay and examined the mines, noticed two main directions for the veins, namely, north-and-south, and east-and-west, and also a number with courses oblique to these. He was struck by the large number of dykes of basalt which occur, and having noticed instances of ore in contact with the igneous rock, appears to have come to the conclusion that the two were genetically connected. He condemned the method of working of the Glasgow Company (*i.e.* "innumerable shallow pits and trenches, with no apparatus for pumping or drawing water") as pernicious to future working and examination, as most of the veins were laid bare in trenches which soon filled with water. After spending three weeks in Islay he finally declared that he never saw so many good veins in such close proximity to one another.

When Macculloch visited the island prior to 1819, the mines were abandoned, and he does not appear to have seen any of the veins. The mines were working again by 1862, and continued in operation till 1880, when they were finally closed down. This last attempt at working seems to have been more systematic than its predecessors. A large washing plant was erected near Mulreesh, and a smaller one near Ballygrant.

Output.—From papers in the Kildalton charter chest it appears that the total amount of lead exported from Islay between 2nd February 1769 and 3rd October 1774 was:—

	Tons.	Cwt.
Bar Lead	260	1
Ore	72	6
Slag of Lead	90	—

About 1770, Mr. Alexander Sherriff, the Leadhills manager, visited Islay, and a comparison between the expenses on £100 worth of lead is given as follows:—

FOR LEADHILLS.

Suppose lead at £14, 15s. per ton:—	£	s.	d.
Royalty to Lord Hopetoun	16	13	4
Cartages to Leith at 30s. per ton	10	10	0
Commission and shipping charges there	3	0	0
	£30	3	4

FOR ISLAY.

Suppose lead same value, <i>i.e.</i> £14, 15s.:—	£	s.	d.
Tack Duty	12	10	0
Cartage to sea at 2s. per ton	1	5	0
	£13	15	0
Balance of Expenses Islay below Leadhills	16	18	4

The following figures, taken from the "Mineral Statistics" (*Mem.*

* Pennant, "A Tour in Scotland and Voyage to the Hebrides," 1790, vol. ii., p. 250.

† Williams, "The Natural History of the Mineral Kingdom," 1810, vol. i., pp. 270–274.

Geol. Surv.), give the output of ore from 1862 till the mines finally closed down :—

Year.	Tons.		Ozs. Silver.	Year.	Tons.		Ozs. Silver.
	Ore.	Lead.			Ore.	Lead.	
1862	34	24	290	1872	—	—	—
1863	34	25	331	1873	100	73	—
1864	60	45	—	1874	80	65	1071
1865	—	—	—	1875	20	15	—
1866	155	116	1708	1876	42	30	150
1867	291	218	2570	1877	200	146	1864
1868	218	161	2413	1878	250	190	2793
1869	121	85	1350	1879	181	135	1687
1870	70	50	840	1880	50	39	1224
1871	13	9	133				

The Veins and their Contents.—The veins of Islay belong to the three main systems which are common to Scotland, namely, north-west to north-north-west, east-and-west and north-east, but unfortunately, as is also the case generally, there is little or no evidence as to the relative age of these systems. In some cases dykes of basalt are found parallel to the veins, and in one instance an east-and-west vein was cut through by a north-west dyke.

The veins vary in thickness from mere strings to 3 or 4 ft., but are very irregular, and often send off branches into the surrounding country-rock. The gangue minerals are calcite and dolomite, with a little quartz. The ores, which are galena, blende, pyrites and chalcopryite, were found to be most plentiful at the junctions of the lodes.

DETAILS OF THE MINES AND VEINS.

According to the old reports, lead ore has been worked at eight distinct localities in Islay, namely, Mulreesh, Portnealon, Shinegart, South Ardachie, North Ardachie, Ballygrant, Gartness and Balitarsin. There are also workings at Robolls, Woodend and Loch a' Chuirn-Bhig, and a copper mine at Kilsleven.

Some of these names are not to be found on the six-inch Ordnance maps, but the localities of the individual mines can be made out with a certain degree of accuracy.

The Mulreesh workings are by far the most extensive, though from the old accounts a fair amount of work was done at Ardachie. The remainder of the workings are in the nature of trials, or mines in what appear to have been fairly rich but small pockets of ore.

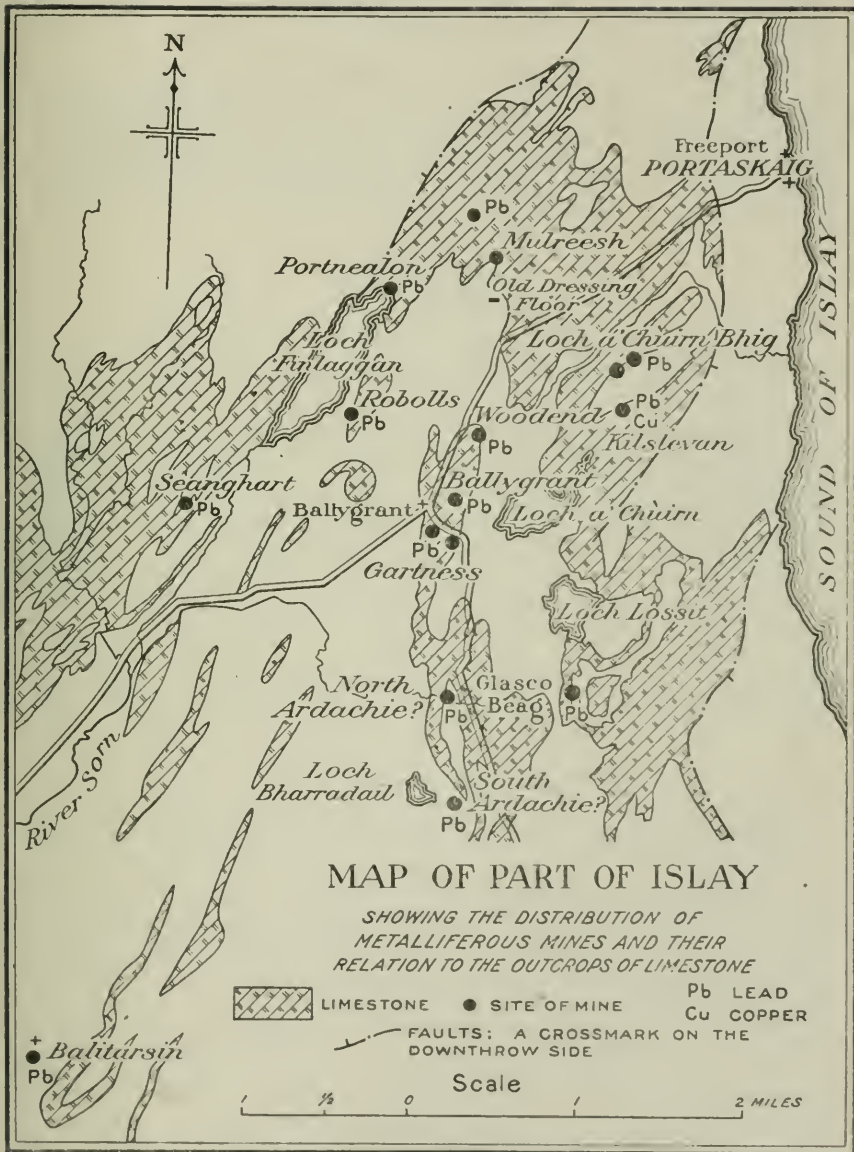
Mulreesh Mines.

(Abandoned.)

Proprietor : Mr. Morrison of Islay.

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 198 N.W.

The old mines and works are situated at Mulreesh ; about 2 miles south-west of Port Askaig and half a mile north-west of the main road to Bridgend. (See Fig. 9.)



The vein has been known for a long time, and in 1770 the workings were 22 fms. deep and the main shoot of ore was 14 fms. long, and had been taken out up to the surface. The ore varied in thickness from mere strings to 4 ft., and was to be seen in the sole of the level from 10 in. to 2 ft. in width. In more recent times the mine has been sunk to a depth of 40 fms., and worked by four levels which are 10 fms. apart.

The vein trends N.N.W., and consists mainly of calcite and dolomite, with galena, blende, pyrites and chalcopyrite. The later workings appear to have been on a fairly extensive scale, and besides those on the main vein there are innumerable trials on offshoots and cross-course veins. The ruins of the old dressing plant, together with a dam and sluice to work the mill, can still be seen.

Portnealon Mine.

(Abandoned.)

Proprietor : Mr. Morrison of Islay.

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 198 N.W.

The exact situation of this mine is dubious, as no such name occurs on the six-inch maps of the area. From the old descriptions it seems possible that Portnealon is contracted from Port-na-eilean, meaning the port of the island, possibly Eilean Mor at the north end of Loch Finlaggan, which is the Portnealon Loch of the old account.

The vein was said to carry ore at the surface, and to run in a north-and-south direction from a point about 400 fms. south of the Mulreesh Vein. From the fact that Mr. Sherriff suggested driving a level northwards on the course of this vein as a means of draining the Mulreesh workings, it appears that its true direction must be nearly north-east.

Shinegart (Seanghart) Mine.

(Abandoned.)

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 198 S.W.

The old mine is situated about half a mile south-west of the south end of Loch Finlaggan and 300 yds. north-east of Ballimartin, to which place is a fairly good road. It was reported upon by Mr. Sherriff, and is said to have carried ore up to 8 in. in width, and to have been abandoned owing to inability to cope with the water. The site of the old shaft, and remains of a dam and sluice, can still be made out.

Robolls Mine.

(Abandoned.)

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 198 S.W.

The old mine is situated on the east side of, and about half a mile north-east from the foot of the Loch Finlaggan. The nearest road is half a mile to the east. The mine seems to have been discovered at a later date than the others as it is not mentioned in the old accounts.

The vein trends north-west, and the ore was dispersed through the limestone in considerable quantities. The works are of no great extent, and the mine was one of the last working in Islay.

Woodend Trials.

(*Abandoned.*)

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 198 S.W.

Numerous old trials occur on the farm of Woodend, from a quarter to half a mile north of Ballygrant. None of them is of any extent, and they appear to be trials along lines of dykes.

Ballygrant Mine.

(*Abandoned.*)

Proprietor : W. Bankeir, Esq., Dunlossit, Islay.

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 198 S.W.

The position of this mine, which is shown on the six-inch Ordnance maps, is about 200 yds. north-east of the village of Ballygrant. The vein trends east-and-west, and fades to the south at about 80°. At the present time little is to be seen except a large hole filled with water. The dump is small, but this is said to be due to the fact that before working ceased the old dumps were removed, and any ore picked out of them.

Gartness Mine.

(*Abandoned.*)

Proprietor : W. Bankeir, Esq., Dunlossit, Islay.

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 198 S.W.

The mine is situated on the farm of Gartness, and on the south side of the Ballygrant Burn, about half a mile south-east of Ballygrant.

This vein is said to trend north-west and to have contained ore up to 2 ft. in width. A small quantity of native silver is stated to have been obtained from the mine. About 150 yds. further west, small trials and open-cast workings can be seen on another vein.

Ardachie Mines.

(*Abandoned.*)

In the old accounts mention is made of lead mines occurring at North and South Ardachie. They are said to be on lands adjoining to Gartness, and from the general description, one gathers that they were either south or south-east of that place. No such name as Ardachie now occurs on the Ordnance maps of Islay, and it has not been possible to locate these mines exactly.

On the accompanying map (Fig. 9) the sites of three old mines are shown occurring from one and a half to two miles south and south-east of Ballygrant. In all probability that near Loch Bharradail is South Ardachie, and the one just half a mile to the north may be North

Ardachie. At present there is little to be seen except the sites of small shafts and open-cast workings at any of the localities.

South Ardachie Mine.

(*Abandoned.*)

Proprietor : W. Bankier, Esq., Dunlossit, Islay.

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 209 N.W.

The vein was worked on a considerable scale about 1770, and is said to trend east-and-west. It contained ore up to 2 ft. in width, and is cut by a basalt dyke.

North Ardachie Mine.

(*Abandoned.*)

Proprietor : W. Bankeir, Esq., Dunlossit, Islay.

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch Argyll 198 S.W.

The old mine is situated about half a mile north of South Ardachie.

The vein trends east-and-west, and ore up to 6 in. in width is said to have been wrought, but the mine was abandoned owing to inability to cope with the water.

Loch a' Chuirn Bhig Mines.

(*Abandoned.*)

Proprietor : W. Bankeir, Esq., Dunlossit, Islay.

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 198 N.W.

Two small workings are to be seen near the north and south ends of Loch a' Chuirn Bhig, which is situated about half a mile south-east of Uchnanclach, on the main road from Port Askaig to Bridgend.

Balitorsin.

(*Abandoned.*)

Maps : One-inch Ordnance and Geological, Sheet 19 ; six-inch, Argyll 208 N.E., S.E.

A vein of lead ore is said to have been found on the farm of Balitorsin, one and a quarter miles E.S.E. of Bridgend.

Kilslevan Mine.

(*Abandoned.*)

Proprietor : W. Bankeir, Esq., Dunlossit, Islay.

Maps : One-inch Ordnance and Geological, Sheet 27 ; six-inch, Argyll 198 S.W.

The old mine is situated close to, and on the east side of the road from Ballygrant to Dunlossit House, and about half a mile north-east of Loch a' Chuirn.

The vein trends north-west, is from 2 to 3 ft. wide, and can be traced for a distance of about a quarter of a mile. It consists

essentially of calcite, with a little copper and lead ores. The mine was discovered about 1760, and was first worked for copper, but more recently a little lead ore was taken from there to Ballygrant for washing.

LOCH FYNE DISTRICT.

This comprises the district on both sides of Loch Fyne in the county of Argyllshire. There are no railways, and the area is mainly served by sea-borne transport.

Maps : One-inch Ordnance and Geological, Sheets 28, 29, 37 ; six-inch, Argyll 12, 126, 141, 161, 170, 181, 191.

Geology.—The rocks of the district are mainly of metamorphic origin, and consist of the following sequence : *

- Intrusive sills of epidiorite and hornblende schists.
- Beinn Bheula Group of Schistose grits.
- Green Beds, epidiorite and chloritic schists with bands of schistose grits.
- The Loch Tay Limestone.
- The Stonefield Schists, with limestone bands.
- Erins Quartzite, consisting essentially of quartzite, with bands of limestone and phyllite.
- Ardrihaig Phyllites, consisting of grey phyllitic schists with bands of quartzite and limestone.
- Loch Awe Group, consisting mainly of pebbly quartzite, black and grey slates and limestones.
- Large intrusions of granitic rocks also occur, together with dykes of basalt.

In the district under consideration the strike of the beds is S.W.-N.E., and the dip is generally in a N.W. direction. The ore deposits are usually associated with the Ardrihaig Phyllites and underlying quartzite, and two types have been noticed, namely, true veins and metasomatic replacements.

THE VEINS AND THEIR CONTENTS.

The Veins vary from mere strings to 10 or 12 ft. in width. In many cases they consist almost entirely of gangue, either quartz or calcite, while others contain fair quantities of siderite. Some of the ore-bearing quartz veins show signs of fracture due to movement, and the broken material has afterwards been recemented either by quartz or siderite. Many of the veins trend north-east, but others have north-west, and east-and-west trends.

The metasomatic replacement deposits are of no great extent, and usually occur as replacements of limestone by metallic sulphide ores. Deposits of this type are often repeated as small pockets of ore along the strike of the parent rock. In some cases the ore consists of only one mineral, but more often it is of a complex nature, and may also contain a good deal of unreplaced rock.

The minerals of the ore deposits.—Many of the deposits have been worked for ores of copper, namely, chalcopyrite, chalcocite, and cupri-ferous pyrites. Galena and blende also occur, and the former has been

* "The Geology of Knapdale, Jura, etc." (*Mem. Geol. Surv.*), 1911, pp. 7 and 8. See also "The Geology of Mid Argyll" (*Mem. Geol. Surv.*), 1905, and "The Geology of Cowal" (*Mem. Geol. Surv.*), 1897.